



TOGETHER
for a sustainable future

OCCASION

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TOGETHER
for a sustainable future

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CONTACT

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Reference No.

7/10

UNITED STATES
OF AMERICA

- (1) HOT POWDER METAL FORMING AND CONVENTIONAL POWDER METAL FORMING USING ELECTRODES.
- (2) HONANAMEI CORPORATION, Higashi-Kasai and Toyama-cho, Higashi-Kasai, Osaka Prefecture, Japan; States of America; Title: HONANAMEI, Higashi-Kasai, Osaka Prefecture, Japan; Phone: (06) 24-2111; Contact: Mr. O. Hirahara, General Manager.
- (3) Private; Sales: Approx. \$25,000,000; No. of employees: 10,000; Main nature of business: Production of iron, steel and ferrous alloy powders.
- (4) Knowhow covering all aspects of production of metal powders at normal and elevated temperatures, including the coatings required for welding electrodes.
- (5) Will sell knowhow under appropriate conditions.

Reference No.

7/11

JAPAN

- (1) PRODUCTION OF REDUCED IRON POWDER
- (2) KAWAGAKI STEEL CORPORATION, New Yarakacho Bld., 11 Yarakacho-1chome, Shiogata-ku, Tokyo, Japan; Title: Kawagaki Steel Corp.; Phone: (3) 341-4111; Telex: 341111; • "RIVEIKO CORP TOK"; Contact: Mr. Misora Ikeda (General Manager).
- (3) Private; Capital: \$20,000,000; Net sales: \$400,000,000; No. of employees: 18,000; Main nature of business: Iron and Steel Manufacturer.
- (4) Technology covering the solid pulverization process which uses pulverized low-carbon steel turnings and filings and also the melting process in which steel is atomized and droplets are solidified and finally the electrolytic process, all of which produce iron powders, are offered.
- (5) We are ready to negotiate for detailed conditions as mentioned above depending upon specific interest of inquirers, taking into consideration type, scale and characteristics of their proposals.

Reference No.

10/8

SECRET
U.S. EMBASSY

(1) STAGIONI DI FERRO

(A) I FERRO DI FERRO (SIA) S.p.A., Via di Aniene, 100, 00186 Roma, Italia, (Tel. 06/478111) (Telex: 32044) (Fax: 06/478111) (Cable: 32044) (International Mailbox).

(B) Private: Capri, 10/11, 31010 Capri, Italy, (Tel. 081/864111) (Telex: 32044) (Fax: 081/864111) (Cable: 32044) (International Mailbox).

(C) Material samples were tested to provide the chemical composition and other pertinent data on steel and cast-iron metals at lower cost. Materials include cast iron, cast steel, material (steel, stainless steel, brass, nickel, copper, etc.) components, metal alloys, and other metal or low-alloy steels.

Liquid Steel (LMS) is a new type of steel which is produced by the use of the new process of liquid steel, and the terms and conditions of sale are subject to the following requirements:

In order to be eligible for the LMS, the purchaser must be a member of the LMS, and must have a valid contract, including, but not limited to, the following:

(1) Nuclear reactor systems, heat exchangers, low pressure vessels, steam generators, water supply pipelines, and other.

(2) Liquid Steel (LMS) is a new type of steel which is produced by the use of the new process of liquid steel, and the terms and conditions of sale are subject to the following requirements:

The following conditions apply to the LMS:

1. LMS is a new type of steel which is produced by the use of the new process of liquid steel, and the terms and conditions of sale are subject to the following requirements:
2. The purchaser must be a member of the LMS, and must have a valid contract, including, but not limited to, the following:
3. All contracts are in Italian, with a New York law, without any limitation of time.

Reference No.

10/9

AI

(1) MEMBRANE FILTRATION OF ALUMINUM AND ITS ALLOYS

(A) MONTEFALINI ELETTRICI S.p.A., Via di Aniene, 100, 00186 Roma, Italia, (Tel. 06/478111) (Telex: 32044) (Fax: 06/478111) (Cable: 32044) (International Mailbox).

(B) Private: Capri, 10/11, 31010 Capri, Italy, (Tel. 081/864111) (Telex: 32044) (Fax: 081/864111) (Cable: 32044) (International Mailbox).

(C) The "MEMFIL" process of electric membrane filtration of aluminum and its alloys is a new type of membrane with aluminum.

The process is a new type of membrane with aluminum.

- Surface membrane and metal.
- Anti-corrosion and corrosion.
- Washable and cleanable.

*Registered Trade Mark.

(D) The process is a new type of membrane with aluminum.

(E) Licensing arrangements grant payment of license fee covering expenses associated with transfer of technology this annual fee. - To be negotiated with the licensor. Training of technical personnel at licensor's expense of plant operation. Technical assistance for licensor transfer and maintenance of plant.

Reference No.

10/10

ITALY

(1) GEL-NUOVA ANODIZZAZIONE DI ALLUMINIO E SUOI ALLOI

(A) MONTEFALINI ELETTRICI S.p.A., Via di Aniene, 100, 00186 Roma, Italia, (Tel. 06/478111) (Telex: 32044) (Fax: 06/478111) (Cable: 32044) (International Mailbox).

(B) Private: Capri, 10/11, 31010 Capri, Italy, (Tel. 081/864111) (Telex: 32044) (Fax: 081/864111) (Cable: 32044) (International Mailbox).

(1) VACUUM HEAT TREATMENT AND HARDENING EQUIPMENT

(2) METALURGY INT., P.O. Box 21, Deltanagar, Po. Haridwar, Dist. Dehra Dun, U.P.;
Phone: 21-22-224; Contact: Mr. Jagan W. Bhandari (Director).

(3) Private; Capital: \$75 million; Sales: \$13 million; No. of employees: 100;
Main nature of business: Metallurgical processes.

(4) Complete capabilities for designing, building and installing vacuum heat treating furnaces and related
finances. Complete technology and know-how of the latest equipment in the field of vacuum.

(5) Will sell equipment and operating knowledge; expert assistance provided to start-up and develop a
technology on application of this equipment to specific metal items.

11/7

(1) HEAT TREATMENT AND HARDENING EQUIPMENT

(2) MISHNA LTD. BANGKOK, P.O. Box 21, C. Ratanak, Bangkok, Republic of Thailand;
Office: 60/11/11/11; Phone: 02-232-2222; Telex: 23222;
Contact: Mr. P. Pichai.

(3) Private; Revenue: 50 million per year; No. of employees: 100; Main nature
of business: Manufacture of heat treating and tempering equipment.

(4) The necessary know-how to manufacture heat treating and tempering installations will be provided under
license agreement. Know-how for the manufacture of automatic and manual, roller burners and the
various parts of the processing furnace or plants will also be made available.

(5) A license agreement will be negotiated which will cover all drawings for construction and the necessary
know-how for the erection of the plant and start-up and operation. The license agreement will also include
provision for training.

MISHNA can also act as consultants for the installation of the plant for a fee and which will depend on
the value and volume of products to be manufactured under the license agreement.

11/8

(1) METHOD FOR MANUFACTURING LINE FOR THE PRODUCTION OF WIRE RODS

(2) NIPPON STEEL CORP., 1-1-1, Maruyama-cho, Chuo-ku, Tokyo, Japan; Office: 2-2-1, Maruyama-cho;
Telex: 23222; Phone: 03-232-2222; Contact: Mr. Takashi Otsuka (Director).

(3) Private; Capital: \$10 million; Sales: \$10 million; No. of employees: 100;
10,000; Main nature of business: Manufacturing; Annual production: 100,000 tons; 1981;
Steel-making; Annual gross steel capacity: 100 million metric tons; 1981; and
Annual capacity new building - 1.2 million metric tons.

- (4)
1. As compared with the mill strip produced by the conventional mill, this process, the manufacturing
process is shorter by 50%. This is very advantageous in terms of the process and the amount
before delivery.
 2. Defects in products are reduced.
 3. This line requires only a very small space and reduced total investment costs and provides
labour saving.

(5) Patent; Know-how; Licensing policy.

11/9

(1) PROCEDURES FOR MANUFACTURING PAIRS BY THE HIGH-FREQUENCY HAMMERING METHOD

(2) NIPPON STEEL CORPORATION, 1-1-1, Otomachi, Chuo-ku, Chiyoda-ku, Tokyo, Japan;
Office: NIPPON STEEL TOKYO; Phone: 23222; Telex: 23222; Contact:
Mr. Makoto Okura (Director).

(3) Private; Capital: \$10 million; Sales: \$10 million; No. of employees: 100;
10,000; Main nature of business: Manufacture and sale of iron and steel and
chemical products and business incidental thereto.

11/10

- (1) The equipment and process available for the production of high strength (1,000,000 psi) steel (1.2% C, 0.05% Mn), and wire welding processes for the production of high strength steel (1,000,000 psi) steel.

The machine is available in the following:

- 1.000 W. 100,000 psi steel (1.2% C, 0.05% Mn)
- 1.000 W. 100,000 psi steel (1.2% C, 0.05% Mn)

- (2) EL-1000, 100,000 psi steel, 1.2% C, 0.05% Mn.
- (3) Process knowhow and/or plant supported against know-how payment.

Reference No.

12/20

INDIA

- (1) ESTABLISHING OF WELDING LABS

(2) ESTABLISHING (Welding Institute) (Welding Institute), Bangalore, Karnataka, India; Contact: Mr. S. S. Srinivasan, Bangalore, Karnataka, India.

(3) Government; State industrial research institute, Bangalore, Karnataka, India; Contact: Mr. S. S. Srinivasan, Bangalore, Karnataka, India; Employees: 1000; Annual budget: Rs. 100000000; Machine: research and development.

- (4) In certain cases, the establishment of welding labs is essential for the development of welding technology based on practice. The establishment of such labs is essential for the development of welding technology based on practice.

- (5) EL-1000, 100,000 psi steel, 1.2% C, 0.05% Mn.
- (6) Process knowhow and/or plant supported against know-how payment.

Reference No.

12/21

UNITED KINGDOM

- (1) WELDING UP OF A WELDING LABORATORY

(2) THE WELDING INSTITUTE, Abington Hall, Abington, Wiltshire, UK; Contact: Mr. A.P.N. Smithwick - Manager, Industrial Services.

(3) Private; Budget: £1,500,000 per annum; 100 employees; 1000; Machine: welding technology, research, development and training.

- (4) Advice and practical help in setting up a welding laboratory, including:

- Assessment of requirements.
- Design and layout of facilities.
- Recommendations on equipment needs.
- Recommendations for staffing.
- Training of staff.

The above will include all aspects of appropriate such as, metallurgy, engineering, mechanical, electrical, application of welding processes, training of welding engineers and operators, maintenance, safety, inspection and qualification.

- (5) Welding is the most important way of assembling metal parts into structures, plant or equipment. It must be monitored and controlled and this requires an organization with the authority to do so.
- (6) Initial assessment, preparation of plans and help in implementation would be on a non-charge basis. After the welding laboratory is set up continuing advice and assistance can be obtained through Technical Membership of the Welding Institute.

Reference No.

12/22

UNITED STATES OF AMERICA

- (1) WELDING AND WELDING METALLURGY ENGINEERING

(2) WELDING TECHNOLOGY INC., 515 SW Chestnut, Beaverton, Oregon, United States of America; Contact: Mr. Don B. Price (President) - 515 SW Chestnut, Beaverton, Oregon 97005, USA (phone: (503) 535-2211).

(3) Private; Adequate capital, incorporated two years; No. of employees: 100 (1000 sq. ft. sub.); Three branch offices on West Coast of USA; Maintenance of major welding processes; Patent "State-of-the-Art" and technical information on cutting and welding of ferrous and non-ferrous metals.

- 4) Knowhow related to: Analysis of the raw materials; preparation of the products; types of products and equipment, manufacturing process; types of machinery; types of tools, materials, and consumables; methods of maintenance; types of measurement; methods of control; types of standards; types of inspection; types of packaging; types of transportation; types of storage; types of disposal; types of recycling.
- 5) All main types of mill, rolling mill, cold-rolled, hot-rolled, etc.; types of steel types and: tool steels of all kinds; control of steel quality; types of equipment for high temperature of steel; methods of process control; types of equipment for inspection; types of equipment for maintenance and repair.
- 6) The preferred payment policy is: periodic cash payment for an initial period, with a rate of interest to be determined. Payment shall be in US dollars or its equivalent in local currency, but a royalty may be received, provided that such royalty shall not be higher than 5%.

Reference No.

5/14

INDIA

- (1) **SIGNAW Process** for production of cast and forged steel.
- (2) **ATMA STEEL COMPANY**, Gurgaon, Street, K. L. Road, Gurgaon, Haryana, India: 122001
Telex: 01-8111 or 01-8100; Delet: India, Gurgaon; Contact: Mr. S. K. Mittal
(India: New Delhi).
- (3) Private; Delet: \$1,000,000; Delet: \$1,000,000; Delet: \$1,000,000
Main nature of machine: Manufacture of tool steels, stainless steels, and cast steels.
- (4) Complete set of processing drawings, training of personnel in all equipment, etc. and: the drawings would include both theoretical and practical instructions. In-plant of plant during the start-up of operations in the developing country.
- (5) Royalty policy; training of recipients; availability for contact with recipient; drawings provided or available.

Reference No.

5/15

INDIA

- (1) **CERTAIN TYPES OF RINGS AND FLANGES**
- (2) **CHROMIUM**, Gurgaon, Street, K. L. Road, Gurgaon, Haryana, India: 122001
Telex: 01-8111 or 01-8100; Delet: India, Gurgaon; Contact: Mr. S. K. Mittal
(India: New Delhi).
- (3) Private; Delet: \$1,000,000; Delet: \$1,000,000; Delet: \$1,000,000
Main nature of machine: Manufacture of rings and flanges.
- (4) - Complete knowhow for the planning and type of the plants and preparation of the drawings of rings and flanges in all steel qualities (forging grade, cast, and mechanical) and: rolling, machining; finishing, quality control and final services.
- Complete knowhow for the production of rings and flanges in different types of steel mills in carbon and alloy constructional steels, 1" diameter to 48" diameter, 100 lbs. weight, supplied in the 12 roll condition, rough machines, rough machines and finished machines according to drawings.
- (5) Rings for mechanical engineering work in bus, railway work. Flanges for the mechanical engineering industries.
- (6) Conclusion of an engineering agreement for a specified period covering all stages of the plant for a new plant or for expansion of an existing plant.
Conclusion of knowhow and technical assistance agreements for specified period with recipient. Technological assistance, training of personnel in Chromi-Steel's work, reputation of Chromi-Steel's technicians for commissioning of the plant and for initial production years.
- Conditions:
- Engineering fees.
 - Technology and know-how normally supplied against cash payment from recipient.

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Conclusion of knowhow and technical assistance agreements for specified periods with supply of technical documents, training of personnel in Greshet-Loire's works, repatriation of French technicians to their home plant and for initial production period (as for the start of the manufacturing process) for existing plants.

Conditions:

- Engineering fee.
- Technology and knowhow normally supplied against each payment (down-payment plus regular).

Reference No.

5/18

FRANCE

- (1) COLD ROLLING OF SPECIAL STEEL STRIPS (COILS)
- (2) GRESHET-LOIRE, Branche Metallurgie, Département Ardennes, Leclercq, St. Rémy, France, 75000 Paris, France; Guide: "FORVALOIRE - IANIS"; Index: 01211; Phone: 01.09.30; Contact: Mr. J. Mouchaux (Head, Technical Department, Leclercq).
- (3) Private; Major producers of alloy and special steel; Guide: 01.09.30; Sales: 10,000 million (1970); No. of employees: 25,000; No. of plants: 10; Main nature of business: Special Steels and Mechanical Structures.

(4) Complete knowhow for the production of cold rolled silicon steel sheets (in coils, in strips or in sheets) in furnace or transformer grade.

(5) Magnetic circuits, laminations for motors, transformers, contactors, electric meters, etc.

(6) Conclusion of an engineering agreement for a specified period covering all engineering studies either for a new plant or for expansion of an existing plant.

Conclusion of knowhow and technical assistance agreements for specified periods with supply of technical documents, training of personnel in Greshet-Loire's works, repatriation of French technicians to their home plant and for initial production period.

Conditions:

- Engineering fee.
- Technology and knowhow normally supplied against each payment (down-payment plus regular).

Reference No.

5/19

FRANCE

- (1) COLD ROLLING OF SPECIAL STEEL STRIPS
- (2) GRESHET-LOIRE, Branche Metallurgie, Département Ardennes, Leclercq, St. Rémy, France, 75000 Paris, France; Guide: "FORVALOIRE - IANIS"; Index: 01211; Phone: 01.09.30; Contact: Mr. J. Mouchaux (Head, Technical Department, Leclercq).
- (3) Private; Major producers of alloy and special steel; Guide: 01.09.30; Sales: 10,000 million (1970); No. of employees: 25,000; No. of plants: 10; Main nature of business: Special Steels and Mechanical Structures.

(4) Complete knowhow for the planning and layout of the plants and machinery required for the production of cold rolled steel strips in special steel (rolling mills, heat treatment, finishing, quality control and plant's service).

Complete knowhow for the production of cold rolled steel strips in the following grades:

- Mild and extra-mild steels for deep drawing.
- Hardened and hardenable carbon steels.
- Constructional alloy steels.
- Stainless and heat resisting steels.
- Special stainless steels and stainless spring steels.

In coils or in straight lengths.

(5) Kitchen appliances, washing machines, automobile accessories, dishes, forks, spoons, fireproof pans, welded tubes, springs, hardware, tools, etc.

(6) Conclusion of an engineering agreement for a specified period covering all engineering studies either for a new plant or for expansion of an existing plant.

Conclusion of knowhow and technical assistance agreements for specified periods with supply of technical documents, training of personnel in Greshet-Loire's works, repatriation of French technicians to their home plant and for initial production period.

Conditions:

- Engineering fee.
- Technology and knowhow normally supplied against each payment (down-payment plus regular).

1. **GENERAL INFORMATION REGARDING THE COMPANY**

Reference No.
5/20
JALAN

1.1 **UNITED ENGINEERING CORPORATION**, 1000 North 10th Street, Suite 1000, Honolulu, Hawaii, 96817; Phone: (808) 531-1111; Telex: 570000; Fax: (808) 531-1111; Website: www.uec.com; Email: info@uec.com; Contact: Mr. Victor L. DeLeonardis (General Manager).

1.2 **Business:** \$100 million; **Year:** 1999; **Employees:** 1,000; **Product:** Manufacturing of machinery and equipment for the various aspects of rolling mill with the necessary finishing operations of the steel mill, namely:
- 1. Cold Mill (Department);
- 2. Hot Mill (Production);
- 3. Hot Mill (Maintenance).

1.3 We are ready to negotiate for detailed conditions as mentioned above depending upon specific interest of equipment, taking into consideration type, make and characteristics of their proposals.

2. **DESCRIPTION OF THE PROJECT**

Reference No.
5/21
UNITED ENGINEERING CORPORATION

2.1 **UNITED ENGINEERING CORPORATION**, 1000 North 10th Street, Suite 1000, Honolulu, Hawaii, 96817; Phone: (808) 531-1111; Telex: 570000; Fax: (808) 531-1111; Website: www.uec.com; Email: info@uec.com; Contact: Mr. A.M. Dickson (Manager).

2.2 **Project:** No. of employees: 400; **Value:** \$10 million; **Product:** Manufacturing of hot-rolled bearings.
2.3 The successful operation of Torrington tapered-roller, ball neck bearings is dependent upon the correct design of the application. Our Technical Department is at the disposal of bearing Mill designers and engineers who are eager to consult as to best finalizing their designs to ensure the optimum conditions, both technically and economically.

2.4 We have a full-time specialist services to help customer achieve the best bearing performance for a longest life.
2.5 The performance of bearings can be expected when installation, lubrication, classification, periodic inspection and other maintenance factors are correctly controlled. Torrington Service Engineers contribute substantially in the operational phase of bearing maintenance work by controlling clearance at Metal Mills throughout the world. Our services are available to all customers in the world.

3. **GENERAL INFORMATION REGARDING THE COMPANY**

Reference No.
5/22
JALAN

3.1 **UNITED ENGINEERING CORPORATION**, 1000 North 10th Street, Suite 1000, Honolulu, Hawaii, 96817; Phone: (808) 531-1111; Telex: 570000; Fax: (808) 531-1111; Website: www.uec.com; Email: info@uec.com; Contact: Mr. Victor L. DeLeonardis (General Manager).

3.2 **Business:** \$100 million; **Year:** 1999; **Employees:** 1,000; **Product:** Manufacturing of machinery and equipment for the various aspects of rolling mill with the necessary finishing operations of the steel mill, namely:
- 1. Cold Mill (Department);
- 2. Hot Mill (Production);
- 3. Hot Mill (Maintenance).

3.3 We are ready to negotiate for detailed conditions as mentioned above depending upon specific interest of equipment, taking into consideration type, make and characteristics of their proposals.

3.4 We have a full-time specialist services to help customer achieve the best bearing performance for a longest life.
3.5 The performance of bearings can be expected when installation, lubrication, classification, periodic inspection and other maintenance factors are correctly controlled. Torrington Service Engineers contribute substantially in the operational phase of bearing maintenance work by controlling clearance at Metal Mills throughout the world. Our services are available to all customers in the world.

4. **GENERAL INFORMATION REGARDING THE COMPANY**

Reference No.
5/23
JALAN

4.1 **UNITED ENGINEERING CORPORATION**, 1000 North 10th Street, Suite 1000, Honolulu, Hawaii, 96817; Phone: (808) 531-1111; Telex: 570000; Fax: (808) 531-1111; Website: www.uec.com; Email: info@uec.com; Contact: Mr. Victor L. DeLeonardis (General Manager).

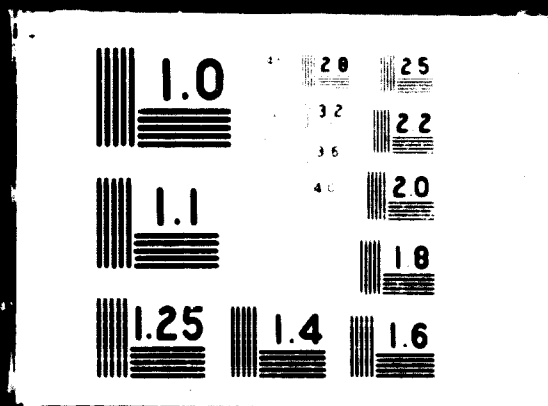
4.2 **Business:** \$100 million; **Year:** 1999; **Employees:** 1,000; **Product:** Manufacturing of machinery and equipment for the various aspects of rolling mill with the necessary finishing operations of the steel mill, namely:
- 1. Cold Mill (Department);
- 2. Hot Mill (Production);
- 3. Hot Mill (Maintenance).

4.3 We are ready to negotiate for detailed conditions as mentioned above depending upon specific interest of equipment, taking into consideration type, make and characteristics of their proposals.

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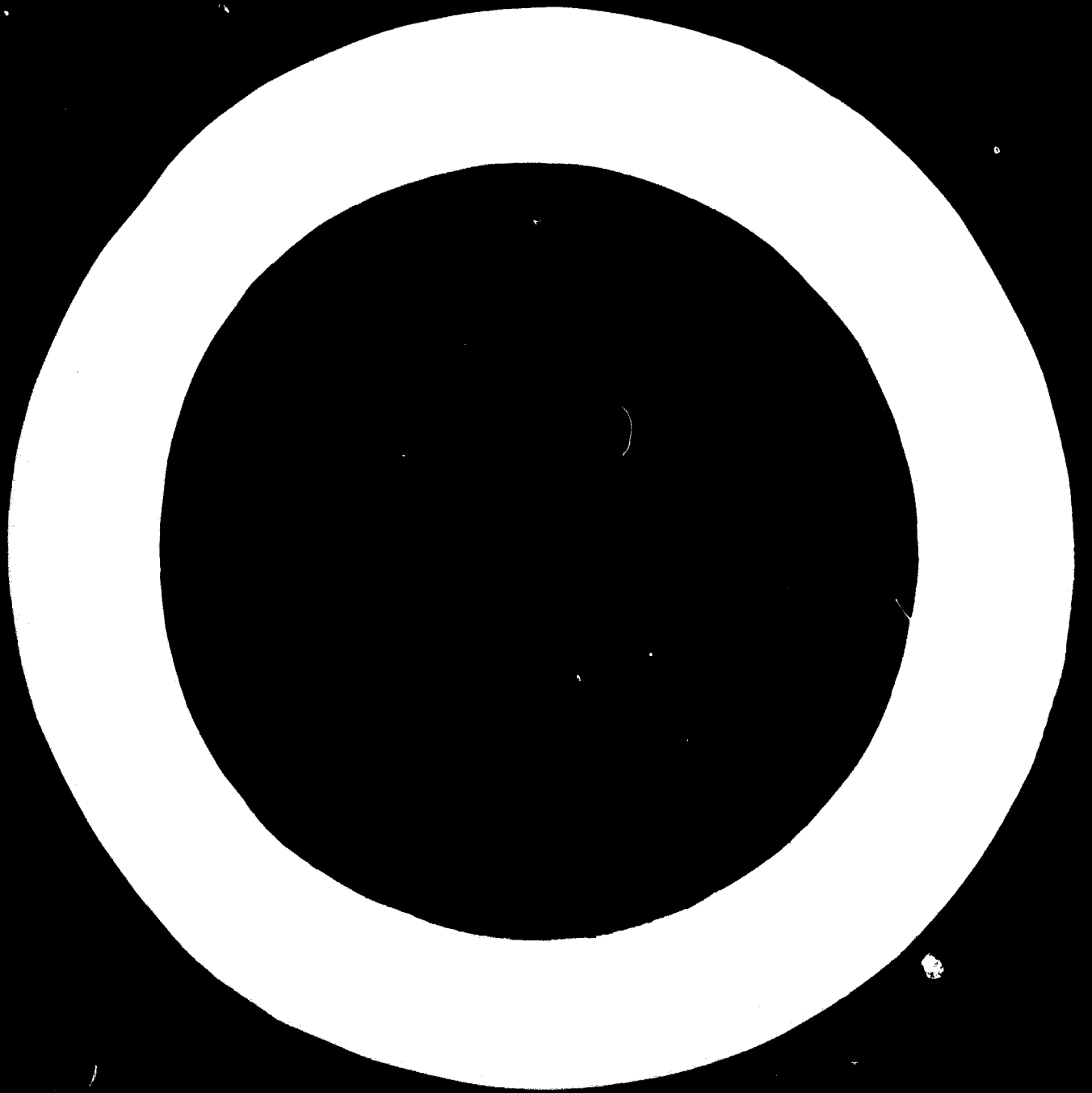


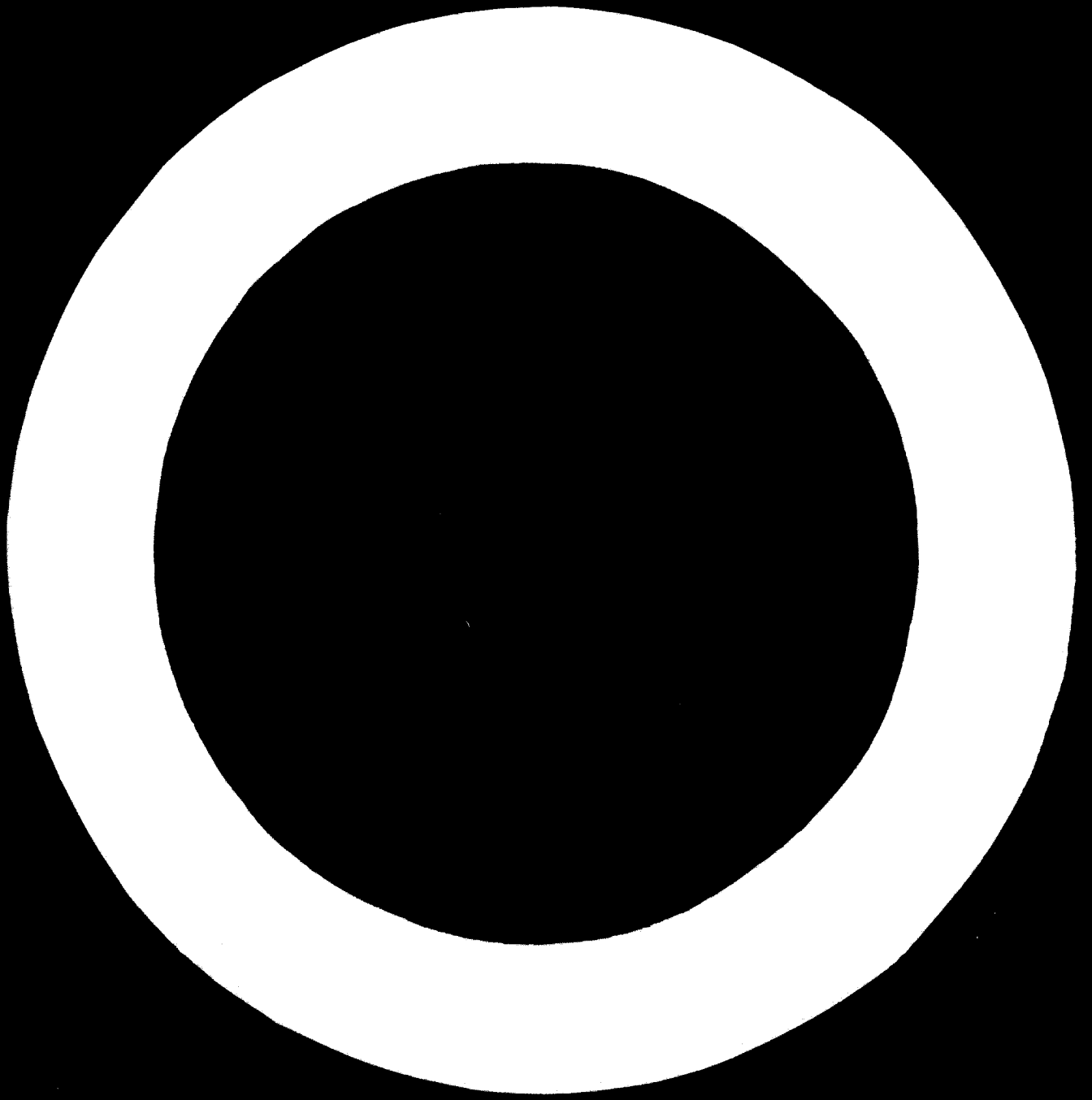


UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

04974

**PORTFOLIO
OF
SELECTED
METAL-TRANSFORMING
TECHNOLOGIES**







UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
VIENNA

**PORTFOLIO
OF SELECTED
METAL-TRANSFORMING
TECHNOLOGIES**

IDZ110
July 1973

PREFACE

The establishment of an efficient, modern metal-transforming industry is a vital element in the development of a developing country. The wide range of processes that are used to transform various types of steel and non-ferrous metals - such as rolling, forging, casting, drawing, extrusion, powder metallurgy, sheet metal forming - are essential to the manufacture of plant and equipment for other industries, for agriculture, for transport, for construction, for medical services.

Technologies in the metal-transforming industries are developing and changing rapidly: new processes, improved materials, and more efficient operational practices are being introduced continually. The advanced industrial countries possess a wealth of knowhow in these areas, the potential value of which is tremendous, especially in the less developed countries. However, lack of information has all too often prevented the introduction of the developing countries from taking advantage of this knowhow.

One of the main roles of the United Nations Industrial Development Organization (UNIDO), as defined in General Assembly resolution 1761 (XVI) that set it up, is to assist in the introduction of information and technological innovations and knowhow and in the adaptation and application of existing technology to the needs of developing countries. In pursuing its objectives, UNIDO recognized the need for an active participation in the transfer of knowhow to the developing countries. Accordingly, it initiated a project on technology transfer in the metal-transforming industries of Latin America. As a first step, UNIDO appealed to the metal industries of the developed countries for information about knowhow available for transfer. A gratifyingly large number of companies, organizations and institutions responded to the appeal and thereby made the portfolio possible.

A broad range of technologies, covering technological innovations and improvements in the application of established technologies, and consulting services are offered. In the field of casting, the knowhow offered embraces new types of alloys for casting and the techniques involved. These range from relatively simple low-pressure sand casting to intricate and complex investment casting techniques. Consulting services in technical drawings, layout, organization and management are also available. The methods by which the knowhow and services were obtained are also varied, ranging from lump sum payments through licensing and royalty agreements, to joint ventures.

The aim of UNIDO in undertaking this project is to promote direct contact between the holders of the technology and the organizations that are making it available. However, it would be happy to provide information and advice to the metal-transforming industries.

The portfolio describes the knowhow that is available in the industrialized countries at the present time. This material will be kept up to date and added to as new technologies and improvements in manufacturing processes and equipment become available.

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HOW TO USE THE PORTFOLIO

The items of technology or knowhow included in the portfolio have been classified by groups. Each group has been given a number as follows:

1. Casting
2. Forging
3. Drawing, stranding etc.
4. Extrusion
5. Rolling
6. Tube-making
7. Powder metallurgy
8. Sheet-metal forming
9. Miscellaneous methods of forming
10. Coating and protection
11. Heat treatment
12. Welding, braising and joining
13. Miscellaneous finishing processes
14. Miscellaneous metalworking processes

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RECOMMENDATIONS

When ...

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Prácticas

El desarrollo de un sector eficiente y moderno industrial de los países en desarrollo depende de la industrialización de su sector energético. Los países en desarrollo necesitan desarrollar y elaborar el hierro primario, el acero y los metales no ferrosos (aluminio, magnesio, titanio, níquel, el cobalto, el platino, el cesio y la plata) y la siderurgia para producir los productos básicos para otras industrias, para la agricultura, para la construcción y para el transporte marítimo.

En las prácticas de transformación de metales, la tecnología es esencial y cada vez más importante en el sector industrial. Los países en desarrollo necesitan tener acceso a la tecnología y al personal para poder desarrollar y aplicar esta tecnología. Los países en desarrollo, sin embargo, la falta de información no impide con mayor frecuencia a los países en desarrollo adquirir esta tecnología.

Uno de los puntos principales de la Organización de las Naciones Unidas para el Desarrollo Humano (ONU) es el desarrollo de la tecnología. En la resolución 200 (XXI) de la Asamblea General de las Naciones Unidas, se menciona que el desarrollo de la tecnología es un elemento esencial para el desarrollo económico y social de los países en desarrollo. La ONU, como un organismo, tiene como objetivo, entre otros, participar activamente en la transferencia de tecnología a los países en desarrollo. Por consiguiente, inició un proyecto de transferencia de tecnología de metales de América Latina. Como primer paso, realizó un inventario de transferencia de metales de los países desarrollados en el que se recopilaron información técnica y conocimientos técnicos disponibles para la transferencia. Como resultado, se recopilaron, se clasificaron y se organizaron los datos de firmas, organizaciones e instituciones. El presente documento es un primer paso en el desarrollo de este proyecto.

La transferencia de tecnología afecta en amplia y creciente medida a los países en desarrollo en la aplicación de tecnología científica y servicios de consultoría. Por ejemplo, en el campo del transporte, los conocimientos técnicos afectan a nuevos tipos de aviones de metal y los sistemas de control de tráfico. Estos avances tecnológicos afectan a las industrias de aviación y a las industrias de transporte marítimo. También se ofrecen servicios de consultoría en materia de planificación, distribución de equipos, organización y gestión de talleres de fabricación. Los procedimientos mediante los cuales se transfieren estos servicios y conocimientos técnicos son también variados, y varían desde los pagos directos, mediante patentes, acuerdos de licencia y sobre pago de materias, hasta la capacitación de personal técnico.

La ONU entiende este proyecto con la intención de promover el contacto directo entre las organizaciones potenciales de la tecnología y las organizaciones que las facilitan. Con este fin, está diseñando e implementando un sistema de información y asesoramiento a las industrias de transformación de metales.

El Repertorio describe los conocimientos técnicos que se hallan actualmente disponibles en las industrias industrializadas. Este material se mantendrá al día y se aumentará a medida que se vayan desarrollando y perfeccionando los procesos y el equipo existentes.

El presente documento se ha reproducido sin pagar honorarios por los servicios de la ONU.

Manera de utilizar el Repertorio

Los puntos de tecnología e conocimientos técnicos incluidos en el Repertorio se han clasificado por grupos. A cada uno de estos grupos se le ha asignado un número, conforme al detalle siguiente:

1. Fundición
2. Forja
3. Estirado, fabricación de cables, etc.
4. Extrusión
5. Laminado
6. Fabricación de tablas
7. Pulymetalurgia
8. Conformación de chapas
9. Otros métodos de conformación
10. Revestimiento y otros métodos de protección
11. Tratamientos térmicos
12. Diversas medidas de soldadura y unión de metales
13. Procesos varios de acabado
14. Procesos varios de transformación de metales

Al principio del Repertorio hay un índice en que se clasifican en categorías y se describe brevemente la tecnología que se trata, indicando su fuente.

Se ha preparado una guía de especificación para cada punto de tecnología que figura en el Repertorio. Esta guía de especificación lleva -en el frente un número paralelo al contenido- un número de referencia cuyo primer dígito corresponde al grupo; el segundo elemento es el número de serie que corresponde a la guía de especificación dentro de ese grupo (por ejemplo: 1/1 es la primera especificación que se refiere a procesos de fundición).

Cada guía de especificación contiene diversos apartados numerados. Para facilitar la consulta, cada uno de estos apartados que corresponden a cada uno de los números, que se indican entre paréntesis.

- (1) Presentación de la tecnología ofrecida
- (2) Nombre, dirección postal, dirección cablegráfica y números de telex y de teléfono de la firma u organización que ofrece la tecnología
- (3) Tamaño, características y principales actividades de la firma u organización que ofrece la tecnología
- (4) Descripción de la tecnología ofrecida
- (5) Posibles aplicaciones de la tecnología
- (6) Forma y condiciones propuestas para proporcionar la tecnología

Cómo obtener la tecnología

Cuando una firma u organización que ya haya estudiado la sección o secciones pertinentes del Repertorio desea obtener más información o explorar las posibilidades de utilizar un proceso o tecnología descritos en el Repertorio, deberá ponerse en contacto con la ONUDI o con la organización local que coopere con la ONUDI en la realización de este programa, según proceda. Los posibles usuarios deberán citar la fuente de información sobre la que hacen su consulta, es decir, el Repertorio de tecnologías para la transformación de metales (Portfolio of Metal-Transforming Technologies). La correspondencia con respecto a la ONUDI deberá dirigirse a:

Sección de Industrias Metalúrgicas
División de Tecnología Industrial
ONUDI
P.O. Box 107
A-1111 Vienna
Austria

La ONUDI pedirá a la firma u organización incluida en el Repertorio que se ponga en contacto con la firma que haya formulado la consulta. Las negociaciones subsiguientes serán de la incumbencia de los dos partes interesadas, si bien la ONUDI está dispuesta a conyugar a dichas partes en el caso de que sea necesario.

Si una firma u organización de América Latina desea solicitar información sobre un proceso de transformación de metales que no figuren en el Repertorio, o sobre la posible aplicación de determinadas tecnologías en determinadas condiciones industriales, podrá dirigirse a la Secretaría General de la ONUDI.

1 - Casting

2 - Forging

3 - Drawing, Stranding, Etc.

1/10	Continuous casting of thin film sheet	ALUMINUM - SWEDEN
1/11	Special casting of zinc-base bearing alloy	ALUMINUM - SWEDEN
1/12	Casting of steel	ALUMINUM - SWEDEN
1/13	Sand casting of bar-bearing alloy, without 1.0 section	ALUMINUM - SWEDEN
1/14	Special steel casting	ALUMINUM - SWEDEN
1/15	Pressure die casting of aluminum alloy for fasteners	ALUMINUM - SWEDEN
1/16	Iron casting	ALUMINUM - SWEDEN
1/17	Radial die casting and patterns	ALUMINUM - SWEDEN
1/18	Hot air furnace operation to produce standard steel and alloy steel castings	ALUMINUM - SWEDEN
1/19	Casting and construction of large steel and aluminum alloy	ALUMINUM - SWEDEN
1/20	Production of rolls for cold rolling	ALUMINUM - SWEDEN
1/21	Manufacture of gas turbine barrel chamber by investment casting	ALUMINUM - SWEDEN
1/22	Shell casting	ALUMINUM - SWEDEN
1/23	Centrifugal cast iron casting process	ALUMINUM - SWEDEN
1/24	Open hearth casting	ALUMINUM - SWEDEN
1/25	Production technology of steel ingots by vacuum casting	ALUMINUM - SWEDEN
1/26	Production of mild steel, ferritic-malleable, nonferrous and gray cast iron	ALUMINUM - SWEDEN

Iron - Castings

1/27	Production of cast for rock drill	ALUMINUM - SWEDEN
1/28	Die casting of engine pistons from hypereutectic Al-Si alloy	ALUMINUM - SWEDEN
1/29	Production of aluminum with cast iron barrel upper aluminum alloy for die casting	ALUMINUM - SWEDEN
1/30	Design of alloy cast iron for die casting	ALUMINUM - SWEDEN
1/31	Production of aluminum for hot-chamber die casting	ALUMINUM - SWEDEN
1/32	Manufacture of steel forging	ALUMINUM - SWEDEN
1/33	Hot forging of carbon steel alloy gears	ALUMINUM - SWEDEN
1/34	Production of heavy steel forging	ALUMINUM - SWEDEN
1/35	Forging of zinc-base alloy cast	ALUMINUM - SWEDEN
1/36	Production of valves and brackets for trailers and semi-trailers	ALUMINUM - SWEDEN
1/37	Production of grinding media	ALUMINUM - SWEDEN
1/38	Drop forging of steel with hammers or mechanical presses	ALUMINUM - SWEDEN
1/39	Flat die forging of steel with hammers and hydraulic presses	ALUMINUM - SWEDEN
1/40	Know-how covering the forging of stainless and alloy steels	ALUMINUM - SWEDEN
1/41	Hot pressings (forging) of aluminum with parallel forms (internal and external)	ALUMINUM - SWEDEN
1/42	Hot pressings (forging) of synchronizing cones for automotive gearboxes	ALUMINUM - SWEDEN
1/43	Manufacture of vehicle leaf springs	ALUMINUM - SWEDEN
1/44	Forging of special steels	ALUMINUM - SWEDEN
1/45	Drop and die forging of special steels	ALUMINUM - SWEDEN
1/46	Forged rolls for cold rolling mills	ALUMINUM - SWEDEN
1/47	Forged and rolled wheels and axles for railways	ALUMINUM - SWEDEN
1/48	Production technology of die forging	ALUMINUM - SWEDEN

Iron - Drawing, Stranding, Etc.

1/49	Tungsten filament wire production	ALUMINUM - SWEDEN
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Extrusion - Steel

Extrusion

Name of organization

1	Development of new extrusion dies	USMIB - AUSTRALIA
2	Development of light-gauge extrusion dies for metal structures	CHATEL-FRANCOIS - FRANCE
3	Development of light-gauge dies	CHATEL-FRANCOIS - FRANCE
4	Hot rolling of steel	BARNS V. HARRAN - USA
5	Production of stainless steel wire from rod	BARNS STEEL - USA
6	Drawn or extruded metal alloys	LANGLAND SPECIALTY WIRE - USA
7	Extrusion of steel wire rods	NONFERREUX SIDERON - ITALY
8	Production of cold-chamber special alloys	INDUSTRIAL WIRE ROPE - USA
9	Production of stainless wire	BARBONE - USA
10	Extrusion of stainless steel wire	ODERBERG - SWEDEN
11	Extrusion of stainless steel wire	KIMM - GERMANY
12	Wire extrusion from metal alloys	METALINDIA - USA
13	Cold drawing of special steel wires	CHATEL-LOIRE - FRANCE

Extrusion - Aluminum

14	Extrusion of aluminum and its alloys	NONFERREUX SIDERON - ITALY
15	Extrusion and cold drawing of quality steel sections	SARREL OCHOPE - FR
16	Production of pipe for extrusion of aluminum	BARROTTEN-RODGERE - AUSTRALIA
17	Know-how in conventional and hydrostatic extrusion	METALINDIA - USA
18	Extrusion of zinc-base alloy shapes and bars	COHINGO - CANADA
19	Light-alloy sections for metal structures (window-frame) mainly	CHATEL-FRANCOIS - FRANCE
20	Production of tubes by extrusion and cold drawing	TUBACEX, S.A. for tubes for extrusion - SPAIN

Rolling - Steel

21	Rolling of alloy and special steels	USMIB - AUSTRALIA
22	Cold rolling of metal sections	ROCKAWAY EXPORT - FR
23	Manufacture of light-alloy rolled products	CHATEL-FRANCOIS - FRANCE
24	Hot rolling of steel	BARNS STEEL - USA
25	Rolling of aluminum and its alloys	NONFERREUX SIDERON - ITALY
26	Manufacture of high-alloy steel bars	SARREL OCHOPE - FR
27	Hot rolling of steel	VIDERBERG - SWEDEN
28	Hot and cold rolling of high-grade steel strip	VIDERBERG - SWEDEN
29	Bloomers and slabbing mills of 1 million tons capacity	KORTI - HUNGARY
30	Reheating furnaces for rolling mills	KORTI - HUNGARY
31	Production of soft iron semiproducts as basic magnetic material	CEMTEL IRON AND METALWORKS - HUNGARY
32	Design and supply of rolling mill equipment	JAMES LUMB - UK
33	Hot rolling of steel bars and wire rod	BOGORE - SWEDEN
34	Knowhow covering the rolling of stainless and alloy steels	ATLAS STEEL - CANADA
35	Circular rolling of rings and flanges	CHATEL-LOIRE - FRANCE
36	Rolling of special steel bars	CHATEL-LOIRE - FRANCE
37	Rolling of special steel plates	CHATEL-LOIRE - FRANCE
38	Cold rolling of silicon steel sheets (non oriented)	CHATEL-LOIRE - FRANCE
39	Cold rolling of special steel strips	CHATEL-LOIRE - FRANCE
40	Cold rolling and finishing of stainless steels	HAWAJARI STEEL - JAPAN
41	Application of roll neck bearings	TOBBINGTON - UK
42	Fully continuous cold-chamber mill	NIFFEON KOREAN - JAPAN
43	Electric-resistance-welder (ERW) tube	NIFFEON STEEL - JAPAN
44	Spiral line pipe	NIFFEON STEEL - JAPAN
45	Advanced marking equipment	NIFFEON STEEL - JAPAN

Portfolio number

Subject

Country of origin

- 5/3 Light gauge coil roll former
- 5/4 Strip piercing mill line and hot strip rolling technology
- 5/5 Techniques for manufacturing rail
- 5/6 Production technology of rolling stock parts (wheels, axle), and tracks

Group - TUBES

- 6/1 Manufacture of steel tubes
- 6/2 Fabrication of aluminum alloy tubes
- 6/3 Production of thin-walled copper and aluminum tubes by pilger rolling and drawing in coils
- 6/4 Manufacture of collapsible aluminum tubes
- 6/5 Production of steel tubes
- 6/6 Cold-drawing of tubes
- 6/7 Continuous manual cooling device for use in pilger rolling of seamless tubes
- 6/8 Extrusion of copper tubes with closed ends
- 6/9 "Bundy Weld" tubing
- 6/10 Tubes produced by centrifugal casting
- 6/11 Electric resistance welded tubes
- 6/12 Manufacture of tapered poles
- 6/13 Production technology of straight seam welded pipe by roll bending
- 6/14 Production technology of spiral welded pipe
- 6/15 Production technology of electric welded steel pipe

Group - POWDER METALLURGY

- 7/1 Production of hardmetal by powder metallurgy
- 7/2 Parts fabrication by powder metallurgy
- 7/3 Powder metallurgy parts production
- 7/4 Manufacture by powder metallurgy of hardmetal carbide tips and tools
- 7/5 Powder metallurgy technology
- 7/6 Production of improved grades of mixed ferrites for use in powder metallurgy
- 7/7 Tooling for sub-miniature powder metallurgy
- 7/8 Cemented carbide products
- 7/9 High purity powder production
- 7/10 Hot powder metal forming and conventional powder metal forming also coating of welding electrodes
- 7/11 Production of reduced iron powder

Group c - SHEET METAL FORMING

- 8/1 Manufacture of pressed products and welded tubes in light alloys
- 8/2 Equipment for determining deep drawing qualities of sheet metal
- 8/3 Training courses in sheet metal forming
- 8/4 Cold roll forming of steel sheet

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Excluded number

Subject

Library of Congress

10/	Protection technology of the metal surface	621.782.001
10/	Protection technology of the metal surface	621.782.002
10/2	Corrosion prevention and protection	621.782.003
10/21	Protection of metallic materials by the electrochemical method	621.782.004
10/30	Prevention of galvanic corrosion	621.782.005

Group 11 - HEAT TREATMENT

11/1	General of the heat treatment of steel and alloy steel	621.783.001
11/2	Stable structure and state of high-alloy steel	621.783.002
11/3	Heat treatment in the metal industry	621.783.003
11/4	The effect of protective atmosphere on the heat treatment of steels and non-ferrous metals	621.783.004
11/5	Salt-bath nitriding heat treatment of cast steel, steel and cast iron components and tools	621.783.005
11/6	Heat treatment of cast-iron components	621.783.006
11/7	Vacuum heat treatment and nitriding operations	621.783.007
11/8	Heat treatment furnace design equipment	621.783.008
11/9	Continuous annealing line for the production of mild steel	621.783.009
11/10	Design for manufacturing steel and alloy steel heat treatment	621.783.010
11/11	Heat treatment equipment of steel	621.783.011
11/12	Heat treatment of steel and alloy steel	621.783.012
11/13	Heat treatment of steel	621.783.013
11/14	Control of heat treatment process	621.783.014

Group 12 - WELDING, BRAZING AND SOLDERING

12/1	Production of welding electrodes	621.784.001
12/2	Production lines for welding plants	621.784.002
12/3	Welding processes for semi-automatic and automatic shielded arc welding	621.784.003
12/4	Apparatus for micro-plasma arc welding	621.784.004
12/5	Semi-automatic equipment for MIG welding	621.784.005
12/6	Transformers for manual arc welding	621.784.006
12/7	Scuffing for manual arc welding	621.784.007
12/8	Explosive welding	621.784.008
12/9	Joining by high-temperature vacuum brazing	621.784.009
12/10	Electric welding	621.784.010
12/11	Welded steel fabrication	621.784.011
12/12	Improvement of weldability of metallic materials (chemistry, microstructure transformation)	621.784.012
12/13	Material for microstructure welding	621.784.013
12/14	Method of selecting heat treatment welder parameters	621.784.014
12/15	Technical assistance and know-how in welding	621.784.015

Portfolio number

Subject

Company or organization

1/1	Production of welding rods and wires for hardfacing	APEX - USA
1/2	Welding of cast-iron cast pipe walls	BEITECHINTI - HUNGARY
1/3	Friction welding of high-speed steel cutting tools	BEITECHINTI - HUNGARY
1/4	Permanently spot welding	BEITECHINTI - HUNGARY
1/5	Cementing of metal parts	BEITECHINTI - HUNGARY
1/6	Setting up of a welding laboratory	THE WELDING INSTITUTE - UK
1/7	Welding and welding metallurgy fundamentals	WELDING TECHNOLOGY - USA
1/8	Welding in a fibrous and a fibrous bonding atmosphere	OFFICE NATIONAL D'ETUDES ET DE RECHERCHES ASSOCIATIVES - FRANCE

Group 12 - MECHANICAL FINISHING PROCESSES

1/1	Manufacture of cold-headed bolts	WITEN-KANTHAL - SWEDEN
1/2	Manufacture of welded steel beams	ITALSIDER - ITALY
1/3	Surface removal on metal bars or tubes	LA SALLE STEEL - USA
1/4	Aluminum temperature drawing of steel bars	LA SALLE STEEL - USA
1/5	Heat treating of metals	HERBES STEEL - USA
1/6	Electrochloric acid pickling process for steel strip	MIDLAND INDUSTRIAL - USA
1/7	Process for pickling bundled steel wire and other materials	STAHLWERKE FÖCHLING-SÜDBACH - FEDERAL REPUBLIC OF GERMANY
1/8	Machining of internal surfaces of hollow vessels before enamelling	KUMI - HUNGARY
1/9	Finishing of metal components	ROYAL SMALL ARMS FACTORY - UK
1/10	Finishing of rolled and/or forged steel bars and wire rod	BOPORS - SWEDEN
1/11	Deformation-free cooling of steel products	NIHON KOKAN - JAPAN

Group 13 - METALLURGY PROCESSES

13/1	Distribution of alumina, foil form	ALUTEC - HUNGARY
13/2	Technical information, storage and retrieval service	AMERICAN SOCIETY FOR METALS - USA
13/3	Manufacture of hot metal tools for cutting and forming	DANNE HAANDMERIAL - DENMARK
13/4	Manufacture of drill equipment	DRITAIWEEK ETHIOPIA - AUSTRIA
13/5	Manufacture of tungsten carbide tips and tipped tools	ROY CARBIDES - UK
13/6	Manufacture of conveyor roll rollers	ITALSIDER - ITALY
13/7	Production of precision roller chains	FRANK KOBRAIER - AUSTRIA
13/8	Manufacture of brass castings, fittings and valves	LOHNEFOM - FINLAND
13/9	Production of aluminum alloy doors and windows	MONTIVATINI EDISON - ITALY
13/10	Patrication, welding, and hot-dip galvanizing of lattice-type structures	FAINER BROS. - UK
13/11	Manufacture of finished products in aluminum	KANSHOFFER-BRENSDORF - AUSTRIA
13/12	Quality control for ball-bearing steel	RESEARCH INSTITUTE FOR FERROUS METALLURGY - HUNGARY
13/13	Manufacture of rolls for cold-rolling mills	STAHLWERKE FÖCHLING SÜDBACH - FEDERAL REPUBLIC OF GERMANY
13/14	Fabrication of structural steelwork	SANDERS AND FOSBERG - UK
13/15	General technical assistance in metal transformation technologies	METALINSTITUUT TNO - NETHERLANDS
13/16	Manufacture of steel and aluminum foils	FELIX WALTERS - AUSTRIA
13/17	Technical information on tin and tin alloys	SIN RESEARCH INSTITUTE - UK
13/18	Production of steel sheet and production of cast iron sheet and cast	FOUNDRY ET GRIGNALLES METALLIQUES (IGM) - FRANCE
13/19	Manufacture of tools for doors and furniture	GRUNDMANN - AUSTRIA
13/20	Engineering cutting tool manufacture	SAMUEL OSBORN - UK
13/21	Insulation technology of tapered rolls	SEIYU KOKO METAL INDUSTRIES - JAPAN

GROUP 1 - CASTING

(1) PRESSURE DIE CASTING OF CORROSION-RESISTANT ALLOY

(2) A.H. ANDERSSON and Co., AB, Viskanstraningen 1, Box 110, 501 01 Sweden; Tel.: 0300; Phone: 0 3/10 07 50; Contact: Mr. Arne Eriksson, Incentive Research and Development AB, Box 11074, D 11 Bromma 11, Sweden.

(3) Private; A member of the Swedish Incentive Group; Main nature of business: Castings, fittings and valves for sanitary purposes.

(4) The A.H. Andersson Company has developed a corrosion-resistant alloy that can be used for casting of tube fittings and valves. This alloy, known as AMETAL, has the same corrosion-resistance properties as Inconel, but can be produced more economically (at about the cost of 0.25 Inconel) and can be die-cast and machined without difficulty.

The company has considerable experience and knowhow in the fields of choice of materials and equipment, the design of tools and dies for casting, and the determination of suitable die and casting conditions.

The use of AMETAL and the Andersson technique results in lower material costs and scrap rates, and the use of pressure die casting. The quality of the finished product is high.

(5) Water tube fittings and valves for sanitary and other purposes.

(6) A non-exclusive license covering manufacture, use, and sale will be offered to potential licensees. Written information and technical information will be made available; this will include not only the present technique, but also future developments. Technical assistance can be provided either at Andersson works in Sweden or at the licensee's works. License conditions: SKr 250,000 plus AMetal metal, together with a payment of about SKr 50,000. Minimum annual requirements to be agreed between the licensor and licensee.

1/1

SWEDEN

(1) INVESTMENT CASTING OF SPECIAL STEELS

(2) Gehr. BOHLER and Co. AG, Postfach 17, A-1011 Vienna, Austria; Cable: Metallwerke Wien; Telex: 1109, 1 81; Phone: 4-25-25; Contact: Mr. W. Ludwig, Acero Bohler S.A. Para SA, L. Centro Bencoes 777, Apartado 803, Lima, Peru.

(3) Governmental; Major producer of special and alloy steels; No. of employees: 10,000; Capital: 500 million; Main nature of business: Production of special and alloy steels in various forms and finishes.

(4) Complete knowhow for planning and layout of investment casting plants. Complete knowhow for manufacturing operations relating to investment casting. Training of personnel in Bohler works. Technical assistance for Bohler personnel for technical assistance in recipient's works.

(5) Conclusion of knowhow agreement for specified period. Technology and knowhow normally supplied on license basis, with additional cash payments. Leasing arrangements can also be made. Technical assistance can also be supplied, subject to agreement on terms.

1/2

AUSTRIA

(1) IRON CASTINGS

(2) BRITISH CAST IRON RESEARCH ASSOCIATION, Ilvechurch, Farnborough RM 10, United Kingdom; Cable: Cira Birmingham; Phone: Reditch 0244; Contact: Mr. H. Morrogh (Director).

(3) Mixed; Co-operative research, development, and consulting organization, with participation by government and private and nationalised industries; No. of employees: 14; Main nature of business: Consulting, research and development for the iron foundry industry.

(4) Services available include: Assistance in all matters relating to the production of cast iron and steel performance in service, including melting, moulding, coremaking, metallurgy of cast iron, mechanical properties, and non-destructive testing. Assistance in work shop, maintenance, and commissioning of new foundries. Financial analysis of new foundry investment. Advice on installation of computers to production control and on quality control.

(5) Report consultancy available on fee-paying basis. Facilities available for contract research.

1/3

UNITED KINGDOM

1/4

TECHNOLOGY OF ALUMINUM ALLOY CASTING

1. "MOSCOWSKAYA TRUST" (Moscow), U.S.S.R.; Tel.: ... and ...; Phone: 5-71; Contact: ... Ministry of Machine Building, Moscow, U.S.S.R.

2. ... for the design and construction of foundry equipment; Main nature of business: Research, design, manufacture of foundry equipment, production of non-ferrous castings.

3. The ... and ... are fully automatic machines designed for pressure die casting using a horizontal plunger. Basic technical data on the machines are given below:

Locking force	t	150
Opening stroke	mm	1000
Op. height	mm	1000
External plunger force	H	10.42
Internal plunger force	H	10.42
Control plunger force	t	11
Opening stroke	mm	1000
Max. counter-pressure	atm	10
Injection force	t	10-15
Max. shot weight	kg Al	100
Shot weight	kg	17
Shot time	sec	10-15
Weight	kg	10000
Overall dimensions	Length mm	2500
	Height mm	1500
	Width mm	1000

4. The technology can be supplied under license, in the form of individual machines or complete mechanized production lines.

1/5

TECHNOLOGY OF ALUMINUM ALLOY CASTING WITH OVERCASTING

1. "MOSCOWSKAYA TRUST" (Moscow), U.S.S.R.; Tel.: ... and ...; Phone: 5-71; Contact: ... Ministry of Machine Building, Moscow, U.S.S.R.

2. ... for the design and construction of foundry equipment; Main nature of business: Research, design, manufacture of foundry equipment, production of non-ferrous castings.

3. The process is carried out with overcasting pressure in a patented ladle and technique. Casting (which is vertical) can be fully or semi-automated, and uses a ladle.

The process permits the production of castings weighing up to 100 kg, with wall thickness of 0.5-0 mm, and a number of 100/100 mm and 100/100 mm, and a number of over 100 atm.

Working is carried out under a pressure of 0.5 atm, with a counter pressure equivalent to one third of the total pressure. Feeding is by means of a vertical pipe from a ladle furnace.

This technique produces castings free from faults and voids, with high strength and density. It is an entirely new process, and a complete range of machines and equipment (VP400 and VP600) have been developed, to provide a mechanized production line for aluminum alloy castings.

4. The technology can be supplied under license, in the form of individual machines or complete mechanized production lines.

(1) MASS PRODUCTION OF NODULAR CAST IRON

(2) ZINBO, DSO "Metalsteer", Botlevo St, Sofia, Bulgaria; Phone: 2-12-12; Contact: Dipl. Eng. D. Kanev, Ministry of Machine Building, Slavyanska St, Sofia, Bulgaria.

(3) Governmental; Central research and development organization of the State Foundry Industry Corporation; Main nature of business: Research, design, and development for the foundry industry.

(4) Complete knowhow on the production of pearlitic and nodular cast iron.

1/6

(1) TECHNOLOGY OF HIGH-ALLOY HOT IRON CASTINGS USING COMPLEX DEOXIDANTS

(2) ZINBO, DSO "Metalsteer", Botlevo St, Sofia, Bulgaria; Phone: 2-12-12; Contact: Dipl. Eng. D. Kanev, Ministry of Machine Building, Slavyanska St, Sofia, Bulgaria.

(3) Governmental; Central research and development organization of the State Foundry Industry Corporation; Main nature of business: Research, design, and development for the foundry industry.

(4) Complete technological knowhow for production of grey inoculated cast iron.

The advantages of the material are as follows:

1. High strength cast iron structure.
2. Good mechanical properties (C-15 by tensile strength, 100-120 hardness).
3. Good wear resistance.
4. Good machinability.

The technique is based on the use of complex inoculants developed by the organization for the hot liquid iron. The knowhow available also covers the design and construction of the furnace for inoculation.

1/7

(1) DESIGN OF HOT-BLAST CUPOLA FOR FOUNDRY USE

(2) ZINBO, DSO "Metalsteer", Botlevo St, Sofia, Bulgaria; Phone: 2-12-12; Contact: Dipl. Eng. D. Kanev, Ministry of Machine Building, Slavyanska St, Sofia, Bulgaria.

(3) Governmental; Central research and development organization of the State Foundry Industry Corporation; Main nature of business: Research, design, and development for the foundry industry.

(4) An original design of hot blast cupola, with diameter of 100-200 mm. This cupola is used in conjunction with a feeder for inoculants. It ensures a high standard of metal quality. It can operate on low-grade coke, and can utilize low-grade coke.

1/8

(1) CONTINUOUS CASTING OF ALUMINUM BILLETS FOR SUBSEQUENT EXTRUSION OF PRODUCTS

(2) CREDEX-REPROBINEY, 11 Avenue Marceau, Paris 16, France; Code: 01000100; Index: 27 907; Phone: 7.0 56 10; Contact: A. Grevet (Head, Technical Assistance Department).

(3) Private; Major French non-ferrous metals producer; Capital: 2,000,000,000 Francs; Sales: 1,100 million; No. of employees: 2,500; Main nature of business: Primary transformation of aluminum: rolling, drawing and extrusion of all wrought aluminum alloys.

(4) The technology available covers the continuous casting of aluminum for subsequent extrusion of products. It is applicable to all aluminum alloys and to all grades required for manufacturing of all products.

The products can be either solid or hollow (for the manufacture of drawn tubes or of sheets for rolling, for example).

The knowhow covers all or part of the following:

1/9

Rolling, casting, bath treatment (pickling, passivating, etc.)
 Design and realization of various equipments, especially those for multiple casting operations
 Casting techniques
 Heat treatment
 Subsequent mechanical treatment (machining)
 Quality control
 Metal recovery from casting process.

The experience of Depasur-Fechinney is derived not only from its major French plants, but also from smaller operations in foreign subsidiaries, and means that the company is equipped to provide the best solution for each local situation.

(4) Depasur-Fechinney can offer the following assistance and knowhow, in part or complete:

- Basic technological documentation
- Assistance in setting up realistic manufacturing programmes
- Selection of basic equipment
- Specification of equipment and issuing invitations to tender
- Preliminary evaluation of tenders
- Assistance in selection of supplier
- Planning and layout of plants
- Advice on ancillary equipment
- Supervision of installation of equipment
- In-plant training
- Commissioning
- Operational planning
- Advice on expansion of existing plant
- Knowhow on new products

Reference No.

1/10

FRANCE

(1) CONTINUOUS CASTING OF ALUMINA FOR IMPROVED ROLLING AND FORMING

(2) DEPASUR-FECHINNEY, 2 Avenue Marconi, Paris 16, France; (Title: Depasur-Fechinney; Sales: 25,000; Phone: 7 00 00 00; Contact: A. Crovet (R&D, Technical Assistance Department).

(3) Private; Major French non-ferrous metals producer; Capital: 2,100 million; Sales: 2,100,000,000; No. of employees: 10,000; Main nature of business: Primary transformation of aluminium: rolling, drawing and extrusion of all wrought aluminium alloys.

(4) The technology available concerns the continuous casting of alumina for subsequent rolling and forming. The client can benefit from the large capacity of the continuous casting mills. All alloys can be cast, possessing the properties needed to provide the correct properties in the final rolled product; for example, the optimal chemical needs for tempering, for airsoftening, for subsequent annealing, painting, deep drawing, etc.

The knowhow covers all or part of the following:

- Rolling, casting, bath treatment (pickling, passivating, etc.)
- Design and realization of various equipments, especially those for multiple plant casting
- Semi-continuous casting techniques
- Heat treatment
- Subsequent mechanical operations (rolling, drawing)
- Exploitation of materials
- Quality control
- Recovery of metal from casting process.

The experience of Depasur-Fechinney is derived not only from its major French plants, but also from smaller operations in foreign subsidiaries, and means that the company is equipped to provide the best solution for each local situation.

(5) Depasur-Fechinney can offer the following assistance and knowhow, in part or complete:

- Basic technological documentation
- Assistance in setting up realistic manufacturing programmes
- Selection of basic equipment
- Specification of equipment and issuing invitations to tender
- Preliminary evaluation of tenders
- Assistance in selection of supplier
- Planning and layout of plants
- Advice on ancillary equipment
- Supervision of installation of equipment
- In-plant training
- Commissioning
- Operational planning
- Advice on expansion of existing plant
- Knowhow on new products

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The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures that the financial statements are reliable and can be audited without issue.

In addition, the document outlines the proper procedures for handling cash payments and receipts. It states that all cash transactions should be recorded in a dedicated ledger, and the balance should be reconciled regularly. This helps in identifying any discrepancies early on and prevents errors from accumulating.

Furthermore, it provides guidelines for recording credit sales and receivables. It suggests using a clear and concise notation to track the amount, date, and terms of each sale. This is crucial for managing the company's cash flow and ensuring that all debts are eventually settled.

The document also touches upon the importance of regular bank reconciliations. It advises that the company's bank statements should be compared against the ledger entries at least once a month. This process helps in catching any unauthorized transactions or bank errors, ensuring the accuracy of the company's financial position.

The second part of the document focuses on the classification of expenses. It details how different types of costs should be categorized into various accounts, such as salaries, rent, utilities, and depreciation. This systematic approach allows for a more detailed analysis of the company's cost structure and helps in identifying areas where costs can be reduced.

It also discusses the treatment of non-cash expenses, such as depreciation and amortization. The document explains how these costs are spread over the useful life of an asset, and it provides the formulas used to calculate their periodic amounts. This ensures that the financial statements reflect the true economic cost of the assets used in the business.

Another key point is the handling of accruals and deferrals. The document clarifies when an expense should be recognized, even if it has not yet been paid, and vice versa. This is essential for adhering to the accrual basis of accounting, which provides a more accurate picture of the company's performance over time.

Finally, the document concludes with a summary of the accounting cycle. It lists the ten steps involved in the process, from identifying the accounting entity to preparing financial statements. This provides a comprehensive overview of the entire accounting process, ensuring that all necessary steps are followed to produce accurate and reliable financial information.

The final part of the document discusses the closing process. It explains how temporary accounts, such as revenues, expenses, and dividends, are closed to the permanent equity accounts at the end of the accounting period. This process resets the temporary accounts to zero, allowing them to accumulate data for the next period.

It also covers the preparation of the closing journal entries, which are essential for completing the accounting cycle. The document provides a step-by-step guide to these entries, ensuring that they are recorded correctly and in the proper order. This final step is crucial for maintaining the integrity of the accounting system and ensuring that the financial statements are ready for review.

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1. Job Title: Welder

2. Employer: Dept. of Defense, Army; Title: Welder, Ordnance, Ordnance Corps; Location: Fort Belvoir, Illinois; Contact: Mr. Alex. ...

3. Dates: Start Date: 10/15/54; End Date: 10/15/54; Duration: 1 year; Status: Full-time; Supervision: Direct, ...

4. Summary: Duties related to the production, repair and maintenance of ordnance equipment, including the design, inspection, fabrication, assembly, and testing of various ordnance components, such as: ...

5. Details of Work: In accordance with the requirements of the job, the welder is responsible for the design, inspection, fabrication, assembly, and testing of various ordnance components, such as: ...

6. Special Requirements: The welder must have a high degree of skill and experience in the use of various welding processes, such as: ...

7. Job Title: Welder

8. Employer: Ordnance Department, 1000 West Lake Avenue, Room 1000, Chicago, Illinois; Title: Welder, Ordnance, Ordnance Corps; Location: Fort Belvoir, Illinois; Contact: Mr. A. W. ...

9. Dates: Start Date: 10/15/54; End Date: 10/15/54; Duration: 1 year; Status: Full-time; Supervision: Direct, ...

10. Summary: Duties related to the production, repair and maintenance of ordnance equipment, including the design, inspection, fabrication, assembly, and testing of various ordnance components, such as: ...

- 1. Design of repair parts to technical drawings.
- 2. Fabrication of parts.
- 3. Assembly of parts.
- 4. Inspection and maintenance of parts.

11. Special Requirements: The welder must have a high degree of skill and experience in the use of various welding processes, such as: ...

12. Job Title: Welder

13. Employer: Ordnance Department, 1000 West Lake Avenue, Room 1000, Chicago, Illinois; Title: Welder, Ordnance, Ordnance Corps; Location: Fort Belvoir, Illinois; Contact: Mr. A. W. ...

14. Dates: Start Date: 10/15/54; End Date: 10/15/54; Duration: 1 year; Status: Full-time; Supervision: Direct, ...

- 1. Design and fabrication of repair parts.
- 2. Supervision of plant operation.
- 3. In-plant training.
- 4. Determining technical assistance and know-how.

15. Job Title: Welder

16. Employer: Ordnance Department, 1000 West Lake Avenue, Room 1000, Chicago, Illinois; Title: Welder, Ordnance, Ordnance Corps; Location: Fort Belvoir, Illinois; Contact: Mr. A. W. ...

17. Dates: Start Date: 10/15/54; End Date: 10/15/54; Duration: 1 year; Status: Full-time; Supervision: Direct, ...

18. Summary: Complete know-how for planning and layout of fabricating parts, including the design, inspection, fabrication, assembly, and testing of various ordnance components, such as: ...

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(3) THE PRODUCTION OF KALHEAPLE, FRAMBLE, KALHEAPLE, MOD LAB AND BAY LAB 1961.

(4) F.B. ROBE METALLURGICAL SERVICES, INC., 51 Haven Road, Winton, Virginia 24378, British Station of America; Phone: (811) 711-1111; Contact: Mr. F.B. Robe, Director.

(5) Private; Principal and five highly qualified associates; last eight years: Technical assistance to metallurgical and foundry industries.

(6) F.B. Robe Metallurgical Services, Inc., provides a complete technical service, including engineering, construction, to the foundry industry.

The Company offers:

1. Assistance to existing foundry operations in all phases of product development, process control, expert technical help in production, control, maintenance, quality control and inspection. The staff is experienced in both mechanical and metallurgical aspects in all processes utilized in the production of iron castings.
2. Assistance in planning new installations. This includes: location, design, layout, equipment selection, construction, operation, and maintenance of new installations.
3. Development of a complete technical service organization for a foundry.
4. Training of operational and technical personnel.
5. F.B. Robe technical representation for off-shore technical assistance in the U.S. market.

(7) Services are provided under a term contract or on a per hour basis. The company will accept short-term assignments to assist in specific plant projects, or will accept short-term assignments and assistance in any part, from planning to operation of new facilities.

The Company does not accept contracts on joint venture or requires a royalty agreement. It works directly for the client to ensure his projects are completed as fast as possible.

Company personnel are available for assignment to the client facilities for any technical assistance required to complete a project. The entire U.S. staff is available for support of activities in the area of metallurgy, upon his or client request.

All activities are carried out in cooperation with client personnel. The use of local personnel in all phases of any new technology. Formal training courses are conducted, if and when necessary, for the benefit and operation of the client.

GROUP 2 - FORGING

(1) PRODUCTION OF BITS FOR ROCK DRILLS

(2) Oy AIRAM Ab, Puhonpuhekata 2-11, 00210 Helsinki 11, Finland; Cable: AIRAM;
Telex: 11443; Phone: 11441; Contact: Mr. Mark SAMMAB (Export Sales Director).

(3) Private; No. of employees: 1,100; Approx. annual turnover: 100 million.
Manufacture of turbines; Manufacture of pumps, dry cell batteries, nonmetal products.

(4) Production of forged steel bits with various hardmetal inserts for use on rock drills.

Reference No.

2/1

FINLAND

(1) DIE FORGING OF ENGINE PISTONS FROM HETEROMETALLIC AL-SI ALLOYS

(2) ALUTERY, Budapest 11, Budapest XIII, Hungary; Telex: 14411 MABAL;
Phone: 444-31/3, 444-31/4; Contact: Mr. F. Kóder (Head of Design Bureau).

(3) Governmental; Design and consulting division of the Hungarian Aluminium Corporation;
No. of employees: 100.

(4) Pistons for high-power diesel and petrol engines are usually produced by die casting. The Alutery process uses instead a process of die forging, which results in longer life, greater reliability, better resistance to overload and wear, and low thermal expansion.

A special heterometallic Al-Si alloy has been developed for this purpose, which has adequate ductility to permit plastic forming, forging, suitable heat treatment, and machining on automatic production lines.

(5) Production of pistons for high-power diesel and petrol engines as a similar high-stress application.

(6) Alutery can offer the following:

1. Design of die-cast piston block, to user's specifications
2. Engineering for the manufacturing process
3. Design of tools (and, where necessary, their manufacture) and transfer of complete know-how
4. Advice on selection of equipment
 1. Supervision of construction and installation of equipment on site
 2. Training of personnel at Hungarian works
 3. Commissioning and start-up of plant, organization of production, and on-site training.

Reference No.

2/2

HUNGARY

(1) PRODUCTION OF WORKPIECES WITH INTERNAL SURFACE FROM ALUMINIUM ALLOYS BY DIE FORGING

(2) ALUTERY, Budapest 11, Budapest XIII, Hungary; Telex: 14411 MABAL;
Phone: 444-31/3, 444-31/4; Contact: Mr. F. Kóder (Head of Design Bureau).

(3) Governmental; Design and consulting division of the Hungarian Aluminium Corporation;
No. of employees: 100.

(4) In many workpieces produced by die forging, an inner cavity or an undercut surface is needed, perpendicular to the direction of forging. From the point of view of strength and performance, the machining of such workpieces has disadvantages, but not for the design and economy. By means of the Alutery process, using suitably designed dies, workpieces of this type can be die-forged from aluminum alloys.

(5) Alutery can offer the following:

1. Transfer of manufacturing rights and know-how by license agreements
2. Design of all tools and transfer of relevant know-how
3. Supply of process equipment
4. Complete engineering for plant
 1. Supervision of construction and installation of equipment on site
 2. Training of personnel at Hungarian works
 3. Commissioning and start-up of plant, organization of production, and on-site training.

Reference No.

2/3

HUNGARY

Reference No.

2/4

AUSTRIA

(1) FORGING OF ALLOY AND SPECIAL STEELS

(2) Gebr. BOHLER and Co. AG, Postfach 11, A-1011 Vienna, Austria; Cable: Bohler-Walser Wien; Telex: 1107, 1782; Phone: 57-25-31; Contact: Mr. W. Finkler, Asst. to Boehler-101 Peru SA, L. Castro Gonzalez 57, Apartado 101, Lima, Peru.

(3) Governmental; Major producer of special and alloy steels; No. of employees: 10,000; Capital: 500 million; Main nature of business: Production of alloy and special steels in various forms and finishes.

(4) Complete knowhow for planning and layout of hammer and air forges for special steels of all grades.

Complete knowhow for manufacturing operations, covering hot forging, air forging, heat treatment, and finishing.

Training of personnel in Bohler Works.

Provision of Bohler experts for technical assistance in established works, i.e. supervision of production, start-up, trouble-shooting in production, etc.

(5) Conclusion of license agreement for production rights.

Technology and knowhow usually supplied on royalty basis, with technical assistance.

Licensing arrangements can also be negotiated.

Training and expert assistance can also be supplied, subject to special conditions.

Reference No.

2/5

UNITED KINGDOM

(1) PROCESS TECHNOLOGY IN HOT STEEL FORGING

(2) GKN FORGING LTD., P.O. Box No. 4, Bromsgrove, Worcester, United Kingdom; Cable: GKN Forging Birmingham; Phone: Bromsgrove 24/44; Contact: Mr. Victor B. Gossack (Overseas Engineering Executive).

(3) Private; Member of GKN and Birtel-Edwards Group; Cable: GKN Forging Birmingham; No. of employees: 10,000; Main nature of business: Production of forged parts for the automotive and other industries.

(4) The Overseas Engineering Division of GKN Forging Ltd. can offer the following range of services in the field of hammer and press forging of steel:

- a. Direct Consultancy Service, adapted to meet the requirements of an existing forging concern, wishing to improve output and utilization of existing plant with minimum capital expenditure.
- b. Specific process consultancy, to meet the needs of a client wishing to start production of a type of forging where proven modern knowhow and/or process technology are vital (e.g. crankshafts, connecting rods), either in an existing forge or a new facility.
- c. Buy-Back projects for clients wishing to set up a new forge with modern technology and to achieve optimum production in minimum time.

(5) For direct consultancy assistance, payment on an instalment basis remitted to UK account.

For major new forge projects payment is normally associated with plant procurement and installation charges.

Under a GKN Forging consultancy, training is given to client's personnel to ensure that appropriate skills, procedures, and techniques are acquired and applied.

Other services include on-site surveys, on-site consultancy and support services from UK.

Projects can be adapted to meet client's requirements for special needs, such as minimum capital outlay, minimum personnel complement and optimum mechanical handling.

Reference No.

2/6

ITALY

(1) MANUFACTURE OF STEEL FORGINGS

(2) ITALSIDER S.p.A., via Cornica 4, 10123 Genova, Italy; Cable: Italsider Genova; Telex: 32059 Italsid; Phone: 1200 Genova; Contact: Mr. Franco Aili.

(3) Major Italian iron and steel producer; Capital: Lit. 1,000,000,000; No. of employees: 44,000; Main nature of business: Production of iron and steel.

(4) Italsider offers complete knowhow in the manufacture of large forgings in carbon and alloy steels. The knowhow covers steel specification, ingot casting, forging, heat treatment, and finish manufacturing operations.

- (1) Many different sizes in the engineering literature, such as crankshafts for large diesel engines, shafts for turbine engines, etc.
 - (2) International assistance program, including by Italcrist staff in recipient's works and training of recipient's personnel in Italcrist works.
- The various possible conditions for transfer of the knowhow will be discussed on application from potential recipients.

(1) HOT FORGING OF CARBON AND ALLOY STEELS

(2) ILLINOIS STEEL COMPANY, 3400 Avenue, Bensenville, Ill. 60015, United States of America; Telex: 25413; Phone: (312) 441-7100, (312) 441-7101; Contact: Mr. Leonard Forna (International Director).

(3) Private; Capital (1973): \$200,000,000; No. of employees: 1,000; Main items of business: Manufacture of steel and its products and machinery.

(4) Illinois Steel Company has for over 100 years been active in the steel industry with an extended experience, using various methods of hot forging. One of the products manufactured is that of forgings. In this sector, the design and production of special equipment and tools are a major activity.

As a result of this long background of training, development, and experience, Illinois specialists are available to transfer their specialized technological knowhow in the field of forgings to interested recipients.

(5) 2. Illinois Steel Company has developed a hot forging which is a series of technical data, including design of receiver, individual instructions, and other technical data, results of practical tests, etc., designed to transfer personnel in the field of hot forging and its products, and the availability of the available information.

3. The following conditions apply to the know-how:

- a. Licensee agreed to provide financial data of the hot forging and its products (including material).
- b. Confidential agreement. The hot forging know-how is a confidential information and will not be disclosed to any third party without the express written consent of the licensor.
- c. Assignment. The hot forging know-how is not assignable, without the express written consent of the licensor.

(1) HOT FORGING OF CARBON AND ALLOY STEELS

(2) ILLINOIS STEEL COMPANY, 3400 Avenue, Bensenville, Ill. 60015, United States of America; Telex: 25413; Phone: (312) 441-7100, (312) 441-7101; Contact: Mr. Leonard Forna (International Director).

(3) Private; Capital (1973): \$200,000,000; No. of employees: 1,000; Main items of business: Manufacture of high-grade carbon, alloy and stainless steels.

(4) Full knowhow of forging steel forgings of all grades to round, square, flat sections in most weights up to 40 tons; also of heating, heat treatment, and finishing.

(5) Expert advice on selection of equipment and operation; results payable in form of low-percent plus percentage of expected value or profit.

Transfer of recipient's personnel at licensor's works is the subject of special agreement.

Special technical assistance available subject to special agreement.

(1) HOT FORGING OF CARBON AND ALLOY STEELS

(2) ILLINOIS STEEL COMPANY, 3400 Avenue, Bensenville, Ill. 60015, United States of America; Telex: 25413; Phone: (312) 441-7100, (312) 441-7101; Contact: Mr. Leonard Forna (International Director).

(3) Private; Capital (1973): \$200,000,000; No. of employees: 1,000; Main items of business: Manufacture of high-grade carbon, alloy and stainless steels.

Reference No.

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INDUSTRIAL PROPERTY
OF AMERICA

Reference No.

2/8

INDUSTRIAL PROPERTY
OF AMERICA

Reference No.

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INDUSTRIAL PROPERTY
OF AMERICA

- (4) Zinc alloy forgings (closed die) or hot pressing have been developed by Comasco and are competitive with brass forgings. Die and tooling costs are low and die practice is easily adaptable to Korloy*. Lower forging temperature (1000 F, 538 C) gives longer die life, better finishes, and easier working conditions.

Comasco offers Korloy* zinc alloy, extruded bar stock (3/8 - 1 1/2 in. dia.) from die casting technology, and technology for forging and finishing of these alloys.

Korloy alloy	Density lb/in ³	Density kg/cm ³	Yield lb/in ²	Classification
310	0.38	10,000	15,000	30
320	0.39	10,000	21,000	30
350	0.41	10,000	41,000	15
3103	0.410	10,000	41,000	30

*Registered Trade Mark, Comasco, Inc.

- (4) Appropriate forms will be provided to assist interested parties in taking advantage of Comasco's technology and process know-how, patents, and application engineering skills.

Facilitation work on a consulting fee basis, production licenses, or flat fee structures, depending on specific situations. Financial arrangements could be concluded for a term of years, depending on contract and, variation of cost.

Export agreements and operator training (in English) are also available.

Reference No.

2/10

FRANCE

- (1) PRODUCTION OF AXLES AND TRAILERS FOR TRAILERS AND SEMI-TRAILERS

- (2) FORGEUR A SOCIÉTÉ ANONYME, 11 Rue A. de Vigny, 75002 Paris, France; Contact: Mr. J. Thom.

- (3) Private; 100 workers (a subsidiary of SOCIÉTÉ ANONYME TRACTEURS); Contact: 100 workers; Main nature of business: AMM, Material for agricultural and industrial machinery.

- (4) - Detailed drawing of axles.
 - Best manufacturing procedure.
 - Choice of production.
 - Choice of the most suitable material.
- (5) - Axle for agricultural use.
 - Axle for highway trailers and semi-trailers.
- (6) - Commercial and technical assistance.
 - Payment made for the know-how.
 - Royalties on the turnover with a minimum amount guaranteed.

Reference No.

2/11

FRANCE

- (1) PRODUCTION OF BRICKS MEDIA

- (2) FORGEUR THOM, 11 Rue A. de Vigny, 75002 Paris, France; Contact: Mr. J. Thom.

- (3) Private; 100 workers (a subsidiary of SOCIÉTÉ ANONYME TRACTEURS); Contact: 100 workers; Main nature of business: Forging - Stamping - Production of machinery.

- (4) - Choice of the metal and of the material to be produced.
 - Forging and subsequent heat treatment.
- (5) BRICKS MEDIA for
 - Clinkers for cement industries.
 - Various ores.
- (6) - Commercial and technical assistance.
 - Payment made for the know-how.
 - Royalties on the turnover with a minimum amount guaranteed.

Reference No.

2/12

SWEDEN

- (1) DROP FORGING OF STEEL WITH HAMMERS OR MECHANICAL PRESS
- (2) AB BOFORNS, S-400 00 Bofors, Sweden; Calls: Bofors, Bofors, Sweden; Telex: 1331; Phone: 0938/300 00; Contact: Mr. Alex. Blomgren (Chief Engineer).
- (3) Private; Share capital: SEK 10 million; Sales: SEK 500 million; No. of employees: 2,500; Nature of business: Steel, machine material, civil engineering products and chemicals.
- (4) Know-how activities relate to new production departments or the modernization of existing installations and covers: Analysis of the project; Inspection of existing facilities; Basic engineering; Choice of processes and equipment, including main data specifications; Suggestions of suppliers; Analysis of tenders, technically and economically; Participation in the negotiations with the suppliers; Supply of process manuals; Training of the client's personnel in the Bofors' works; Assistance of our experts at the start-up of the new plant.
- (5) Drop forged products, such as crank shafts, connecting rods and other automotive parts as well as forgings for aircraft and other industries. The steel types are from plain carbon steels to high alloyed special steels including stainless and heat resisting alloys.
- (6) The preferred payment policy is: Periodic cash rates preceded by an initial down-payment. The periods and rates are to be agreed upon. Payment shall be in Swedish or other freely transferable currency. A payment policy based on royalty may be considered, provided that satisfactory conditions can be agreed upon.

Reference No.

2/13

SWEDEN

- (1) FLAT DIE FORGING OF STEEL WITH HAMMERS AND HYDRAULIC PRESSES
- (2) AB BOFORNS, S-400 00 Bofors, Sweden; Calls: Bofors, Bofors, Sweden; Telex: 1331; Phone: 0938/300 00; Contact: Mr. Alex. Blomgren (Chief Engineer).
- (3) Private; Share capital: SEK 10 million; Sales: SEK 500 million; No. of employees: 2,500; Nature of business: Steel, machine material, civil engineering products and chemicals.
- (4) Know-how activities relate to new production departments or modernization of existing installations and covers: Analysis of the project; Inspection of existing facilities; Basic engineering; Choice of processes and equipment, including main data specifications; Suggestions of suppliers; Analysis of tenders, technically and economically; Participation in the negotiations with the suppliers; Supply of process manuals; Training of the client's personnel in the Bofors' works; Assistance of our experts at the start-up of the new plant.
- (5) A great variety of flat die forged products with piece weights of 1 to 20 metric tons when forged, such as: rolls for hot and cold rolling mills; dies blocks for drop forging and plastics forming; shafts and discs for waterwheels and steam turbines, etc., as well as forged bars with different cross-sections. The steel types are from plain carbon steels to high alloyed special steels including stainless and heat resisting alloys.
- (6) The preferred payment policy is: Periodic cash rates preceded by an initial down-payment. The periods and rates are to be agreed upon. Payment shall be in Swedish or other freely transferable currency. A payment policy based on royalty may be considered, provided that satisfactory conditions can be agreed upon.

Reference No.

2/14

CANADA

- (1) KNOW-HOW COVERING THE FORGING OF STAINLESS AND ALLOY STEELS
- (2) ATLANTIC STEEL COMPANY, Centre Street, Welland, Ontario, Canada; Calls: Atlas Welland; Telex: 671-5114 or 011-1180; Phone: (416) 291-1161; Contact: Mr. William A. Thomas (Senior Vice-President).
- (3) Private; Sales: \$10.1 million (world-wide); No. of employees: 2,500; Nature of business: Manufacture of tool steels, stainless steels, and alloy steels.
- (4) Complete set of processing standards, training of personnel on all equipment pertinent to contract. This would include both theoretical and practical instruction. Dispatch of Atlas technical people to aid in the start-up of operations in the developing country.
- (5) Royalty policy: Training of recipients; Availability for contact with recipients; Expert assistance provided or available.

Reference No.

2/15

UNITED KINGDOM

- (1) HOT PRESSING (FORGING) OF ALUMINIUM WITH PARALLEL OR WITH HEXAGONAL OR OCTAGONAL
- (2) BRASS AND ALLOY PRESSING (BENTON) LIMITED, Liverpool Street, Birmingham B1 4AP, United Kingdom; Cable: Bralloy, Birmingham; Telex: 33000 Bralloy; Phone: 051 772 0515; Contact: Mr. A.E. Clarke (Director).
- (3) Private; Annual sales: £94,000; Issued capital: £25,000; No. of employees: 120; Main nature of business: Manufacturers of hot non-ferrous forgings.

- (4) Tooling design and manufacturing methods have been developed to produce Aluminium forgings with parallel cores and outside forms at economical costs. Components are produced using specially designed tooling on standard presses. The process is not suitable for drop hammers and is best suited to the crank type of press. Internal forms can be provided in the shape of hexagons, squares, circles etc., as well as to cylindrical forms. Where required, tolerances of plus and minus 0.13 mm (0.005 inches) can be guaranteed.
- (5) Where required, we will provide assistance with purchase and installation of plant and equipment, design and manufacture of tooling, details of manufacture of components and inspection methods. Work undertaken at cost followed by royalty terms based on component production. Expenses to be negotiated.

Reference No.

2/16

UNITED KINGDOM

- (1) HOT PRESSING (FORGING) OF NON-FERROUS METALS FOR AUTOMOTIVE SPINDLES AND
- (2) BRASS AND ALLOY PRESSING (BENTON) LIMITED, Liverpool Street, Birmingham B1 4AP, United Kingdom; Cable: Bralloy, Birmingham; Telex: 33000 Bralloy; Phone: 051 772 0515; Contact: Mr. A.E. Clarke (Director).
- (3) Private; Annual sales: £750,000; Issued capital: £25,000; No. of employees: 120; Main nature of business: Manufacturer of hot non-ferrous forgings and forgings.

- (4) Production of synchronizing cones for automotive gearboxes by hot pressing using flat dies to form material to finished dimensions and do not require subsequent machining. You offer details of complete production cycle from raw material to finished machine component.
- (5) Will provide, where required, assistance with purchase and installation of plant and equipment, design of raw material, design and manufacture of tooling, manufacture of components and inspection. Work undertaken above at cost followed by royalty terms based on component production. Expenses to be negotiated.

Reference No.

2/17

UNITED KINGDOM

- (1) MANUFACTURE OF VEHICLE LEAF SPRINGS
- (2) BROCKHOSE EXPORT LIMITED, Birmingham Road, West Bromwich, Staffs., United Kingdom; Telex: Brockex West Bromwich 330011; Phone: 051-583 4911; Contact: Mr. E. Garside (General Manager).
- (3) Private; Capital: £10 million; Sales: £20 million; No. of employees: 4,000; Main nature of business: Engineering.

- (4) Manufacture of vehicle leaf springs for cars and commercial vehicles, etc. The springs are made from flat strip which is forged, assembled and then heat treated.
- (5) Pric for setting-up complete plant, including training of personnel. Joint ventures also considered.

Reference No.

2/18

FRANCE

- (1) FORGING OF SPECIAL STEELS
- (2) CREUROT-LOIRE, Branche Metallurgie, Département Approvisionnement Technique, 11, rue de Londres, 75008, Paris, France; Cable: "FORGALOIRE - PARIS"; Telex: 33000 Bralloy; Phone: 001.05.80; Contact: Mr. J. Nouhem (Head, Technical Cooperation Department).

- (3) Private; Major producers of alloy and special steels; Capital: 1,000,000,000; Sales: 1,000,000,000 million (1970); No. of employees: 40,000; No. of plants: 25; Main nature of business: Chemical and Mechanical Engineering.

... treatment, ... with a steel ...
 ... of heavy ...
 ... of basic ...

... mechanical engineering ...

... feasibility ...
 ... of electricity and ...
 ... of basic equipment with specifications ...

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- (4) - Complete know-how for the planning and layout of the plant and for the design of the forged rolls for cold rolling mills with regard to material, profile, steel rolling order, tempering, induction hardening and heat treatment, etc. - equipment and plant's service.
- Supply of the induction hardening and tempering installations.
- Complete know-how and technical assistance for the project and its execution.

2.3. This type of service is usually provided for all types of mills.

- (4) All types of cold rolling mills.
- (4) - Conclusion of an engineering agreement for a specified period covering all or part of the plant to undertake production of forged rolls for cold mills or other similar work, including the procurement of new equipment and machines, etc.
- Conclusion of know-how and technical assistance agreements for specific periods, including technological documents, training of personnel in respect to design, development, etc. of technicians for commissioning of the installation and for initial production period.
- Supply of the induction hardening and tempering installations.

Conditions:

- Engineering fee.
- Technology and know-how normally supplied against cash in advance.
- Expenses applied at and from Government's share.

Reference No.
2/21
JAPAN

- (1) FORGED AND ROLLED RAILS AND AXLES FOR RAILWAYS
- (1) NIPPON-ISHI, Iron and Steel Works, Ltd., 1-1-1, Higashi-Shinjyuku, Shinjyuku-ku, Tokyo, 162-8588, Japan; Tel: 3-3341-1111; Telex: 3341; Fax: 3-3341-1111; E-mail: nishi@nishi.co.jp; Website: www.nishi.co.jp

(4) Private; Major products of alloy and carbon steel; Capacity: 1,000,000 tons/year; No. of employees: 40,000; No. of plants: 10; Nature of business: Production and sale of carbon steel rolled products, steel rolled products, forging, casting, rolling stock parts, etc.

- (4) - Complete know-how for the planning and layout of the plant and for the design of the forged wheels and axles for railways, as well as for rollers.
- Complete know-how and technical assistance for the project and its execution:

- COILS WHEELS: All types of forged and rolled wheels for railway and other mills.
- WHEEL AXLES: For locomotive or rolling stock.
- ROLLING RIMS: For locomotive or rolling stock.
- ROLLERS: In forged steel (closed or open) for overhead cranes, shafts, etc., etc.

(5) Locomotives and waggon, industrial equipment.

- (4) - Conclusion of an engineering agreement for a specified period covering all or part of the plant to undertake a new plant or for expansion of an existing plant.
- Conclusion of know-how and technical assistance agreements for specific periods, including technological documents, training of personnel in respect to design, development, etc. of technicians for commissioning of the plant and for initial production period.

Conditions:

- Engineering fee.
- Technology and know-how normally supplied against cash in advance.

Reference No.
2/22
JAPAN

- (1) PRODUCTION TECHNOLOGY OF IRON PIPEMENTS
- (1) NIPPON METAL INDUSTRIES, LTD., 1-1-1, Higashi-Shinjyuku, Shinjyuku-ku, Tokyo, 162-8588, Japan; Tel: 3-3341-1111; Telex: 3341; Fax: 3-3341-1111; E-mail: nishi@nishi.co.jp; Website: www.nishi.co.jp

(4) Private; Capacity: 1,000,000 tons/year; No. of employees: 40,000; Nature of business: Production and sale of carbon steel rolled products, steel rolled products, forging, casting, rolling stock parts, etc.

(4) Production technology of crank shaft, front axle shaft, including die casting and heat treatment.

- (4) 1. Engineering service at the construction of production facilities.
- 2. Technical assistance of operation and quality control.
- 3. Training at our plant in Japan.

GROUP 3 - DRAWING, STRANDING, ETC.

1.0) DRAWING: BELAND WITH PROVISIONS

2.0) BY: ALBAM A., Inc., 1000 Broadway, New York, N.Y. 10001; Tel: ALBAM
 3000; Telex: 22400; Contact: Mr. Mark KAMIAN, District Sales Engineer

3.0) Drawings: 1.0, 2.0 and 3.0; Agency: 1.0, 2.0, 3.0; Date of Issue: 1.0, 2.0, 3.0; Date of Revision: 1.0, 2.0, 3.0; Description: 1.0, 2.0, 3.0

4.0) Quantity: 1.0, 2.0, 3.0

Reference No.
3/1
 FINLAND

1.0) DRAWING: ALUM AND OPERATING REGS

2.0) BY: MOHLER, Inc., A1, 1000 Broadway, New York, N.Y. 10001; Tel: MOHLER
 3000; Telex: 22400; Contact: Mr. W. Frank, American Division
 1000 Broadway, New York, N.Y. 10001

3.0) Drawings: 1.0, 2.0, 3.0; Agency: 1.0, 2.0, 3.0; Date of Issue: 1.0, 2.0, 3.0; Date of Revision: 1.0, 2.0, 3.0; Description: 1.0, 2.0, 3.0

4.0) Quantity: 1.0, 2.0, 3.0

Reference No.
3/2
 ALGERIA

1.0) DRAWING: ...

2.0) BY: ...

3.0) Drawings: ...

4.0) Quantity: ...

Reference No.
3/3
 ...

1.0) DRAWING: ...

2.0) BY: ...

3.0) Drawings: ...

4.0) Quantity: ...

Reference No.
3/4
 ...

10. The contractor shall be responsible for the following:

- External and internal, above and below ground, all types of structures.
- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations, including design and construction of structures and types of foundations.
- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations.

The contractor shall be responsible for the following:

- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations.
- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations.
- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations.

The experience of Contractor-Designers is derived not only from the design and construction of structures and types of foundations, but also from the design and construction of structures and types of foundations, including design and construction of structures and types of foundations.

These projects have been completed and installed:

- Barre: Manufacturing processes, transport systems, fixed and mobile structures.
- Barre: Manufacturing processes, transport systems, fixed and mobile structures.
- Barre: Manufacturing processes, transport systems, fixed and mobile structures.

11. Contractor-Designers shall be responsible for the following activities and drawings, including:

- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations.
- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations.
- Design and construction of structures and types of foundations, including design and construction of structures and types of foundations.

Reference No.

3/5

AMERICAN
AMERICA

(1) HOT DRAWING OF STEEL

1. LUCAS STEEL COMPANY, 12000 W. Highway 10, Dayton, Ohio, U.S.A. (Telephone: 513-233-1000; Telex: 25110; Cable: 25110; Fax: 25110)

Private: Messrs. J. H. and Barbara D. Smith; Tel: 513-233-1000; Telex: 25110; Cable: 25110; Fax: 25110

No. of employees: 10; Main nature of business: Hot rolling of steel plates and sheets.

2. With a background of hot-rolled steel and hot-rolled steel products, including design and construction of structures and types of foundations, including design and construction of structures and types of foundations.

3. Plant layout, process and other related data.

4. Declaration of results and cost savings, as well as other related data.

Reference No.

3/6

AMERICAN
AMERICA

(1) HOT DRAWING OF STEEL

1. LUCAS STEEL COMPANY, 12000 W. Highway 10, Dayton, Ohio, U.S.A. (Telephone: 513-233-1000; Telex: 25110; Cable: 25110; Fax: 25110)

Private: Sales Dept.; Tel: 513-233-1000; No. of employees: 10; Main nature of business: Speciality plate steel producer and fabricator.

2. Lucas Steel Company has for many years served the metal-forming industries with the latest equipment, using various methods of hot forming. One of the processes used is that of drawing. In this process, the hot-rolled steel is drawn through a die to produce a desired shape. In this process, the hot-rolled steel is drawn through a die to produce a desired shape. In this process, the hot-rolled steel is drawn through a die to produce a desired shape.

As a result of this long background of training, development, and experience, Lucas Steel Company is able to transfer their specialized technological know-how in the field of drawing to other metal-forming industries.

- (1) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (2) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (3) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.

Reference to:
3/10
DATE: 3/10/77
PAGE: 10

- (1) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (2) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (3) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.

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3/11
DATE: 3/11/77
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- (1) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (2) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (3) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.

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DATE: 3/12/77
PAGE: 12

- (1) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (2) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.
- (3) description of work items completed or in progress, including the location of the work items, the nature of the work items, and the date of completion.

- (4) Manufacture of steel and aluminum cables, covering rod and wire drawing, annealing, coiling, and stranding. The process consists of wire drawing with continuous electric annealing in-line between benches. After drawing, the wires are coiled automatically. Basket-type mesh stranding equipment is used; this is adaptable to the production of aluminum and copper conductors and wire mesh.
- (5) The present process for the quantity production of conducting cables for HV overhead transmission lines.
- (6) Available according to conditions and payment fixed in individual contract, to be renegotiated. Technical and manufacturing process description, training of recipient's personnel in Hungarian plants, and technical assistance provided under separate agreement.

11. WIRE DRAWING OF HIGH STRENGTH ALLOY

- (1) MANUFACTURER: INCO, P.O. Box 701, Calmar, Pa. 16011, United States of America; Phone: 412-436-2000; Contact: Mr. Leonard W. Brumby (President)
- (2) Capital: \$ 2,100,000; Sales: \$ 3.15 million; No. of employees: 20; Manufacture of products: Wire drawing machines.
- (3) Types, sizes and quantities of the products: Five wires of ultra high strength alloy in the USA. Quantity: 111,000 lbs.
- (4) Will sell heating equipment. Will sell equipment and/or steel for producing five wires of an alloy of high temperature alloy.

Reference No.

3/13

UNITED STATES
OF AMERICA

12. WIRE DRAWING OF SPECIAL STEEL WIRES AND BARS

- (1) MANUFACTURER: INCO, P.O. Box 701, Calmar, Pa. 16011, United States of America; Phone: 412-436-2000; Contact: Mr. Leonard W. Brumby (President); Department: Engineering Department.
- (2) Capital: \$ 2,100,000; Sales: \$ 3.15 million; No. of employees: 20,000; Number of plants: 2; Manufacture of products: Special Steels and Mechanical Engineering.
- (3) Complete drawings for the planning and layout of the plant and machinery required for the production of cold drawn steel wires and bars (drawing benches, wire drawing machines, heat treatment, finishing, quality control and plant services).
- (4) Complete know-how for the production of cold drawn steel wires and bars in the following grades:
 - Carbon and alloy constructional steels (including cold heading qualities)
 - Stainless and heat resisting steels
 - Stainless steels for cold heading
 - Stainless steels for welding electrodes
 - Free cutting carbon and alloy constructional steels
 - Free cutting stainless steels
 - Carbon and stainless steels for springs in coils, rods or straight lengths.
- (5) Types of mechanical engineering applications, bolts, pins and screws, rivets, welding electrodes, springs, stabilizers, stems, kitchen appliances, wire mesh, etc.
- (6)
 - Conclusion of an engineering agreement for a specified period covering all engineering studies either for a new plant or for expansion of an existing plant.
 - Conclusion of know-how or technical assistance agreements for specified periods with supply of plant technological documents, training of personnel in present plant's works, repetition of Creusot-Loire's technical assistance for commissioning of the plant and for initial production period.
- (7) Conditions:
 - Mechanical etc.
 - Will sell heating and drawing equipment and/or steel for producing five wires of an alloy of high temperature alloy.

Reference No.

3/14

FRANCE

GROUP 4 - EXTRUSION

4/1

(1) EXTRUSION OF ALUMINIUM AND ITS ALLOYS

(2) MONTECATINI EDISON S.p.A., Foro Buonarote 11, P.O. Box 120, Milano, Italy; Cable: Modelis; Telex: 316379; Phone: 02/77; Contact: Dr. Robert Trueman (Manager, Process and Product Development - DIMM), Montecatini Edison S.p.A. Foro Buonarote 11, Milano

(3) Private; Capital: Lit. 40 billion; Sales (1970): Lit. 20.8 billion; No. of employees: 12,000; Main nature of business: Manufacture of aluminum, metals and ferroalloys.

(4) Know-how for extraction (by means of electrolytic process) of aluminum billets, in sections of various configurations, tubes, and bars of various diameters and shapes, comprising the following activities:

- Cutting and heating of billets
- Billet extrusion, with possibility of continuous hardening inline
- Cutting and finishing
- Annealing

(5) Licensing arrangements against payment of license covering expenses connected with transfer of technology, plus annual royalty - to be negotiated with recipient. Training of technical personnel who will operate and manage a plant operation. Technical assistance for installation, transfer and start-up of plant.

4/2

(1) EXTRUSION AND COLD DRAWING OF QUALITY STEEL SECTIONS

(2) GAMBEL GROUP LTD., High Steel Works, P.O. Box No.1, Sheffield S. 10P, United Kingdom; Cable: Oshorn Sheffield; Telex: 341821; Phone: (0542) 0044; Contact: Mr. S.W. Foster (Group Project Manager)

(3) Private; An international group of companies formed 1962; Capital: £1 million; Sales: £20 million; Employees: 2,000; Main nature of business: Manufacture of high-quality steel bars, extruded steel sections, rolled sheets, cutting tools, etc.

(4) A comprehensive package covering our current process, product, equipment and operating know-how and know-how for extruding, cold drawing, and finishing of carbon steels, low-alloy steels, stainless steels, and certain super-alloys and exotic metals from prepared billet. Structural layout and construction requirements are based upon a nominal output capacity of 2,000 tons per annum of current range value of approximately £1 million at an average of £200 per ton requiring capital expenditure of the order of £1.5 million.

Finished products are solid and hollow sections with the variety of section shape to requirements and lengths cut from extrusions up to 12 meters in length. Maximum input billet weight is 20,000 kg. Extrusion and cold drawing-sectional extruded area is some 5,000 sq. cm. within a diameter of 105 mm. Extrusions are made to close tolerances as to section, section change over length, and section twist over length. Cold drawing and cold straightening is applied as may be required to improve tolerances, surface finish, and mechanical properties of the product.

Manufacturing techniques include billet preparation, billet heating via electric induction heating, process heat source, extrusion, heat treatment, cold straightening, re-coiling, cold drawing, finishing procedures and all materials-handling equipment.

Back-up know-how is offered covering project management requirements and procedures from a design office, plant to a fully operational unit including drawings, layouts, equipment, planning, cost and production control techniques. Technical and operational guidance and information are available in respect of process and material range, product manufacturing routes, quality standards and control, production planning and control, cost control manager requirements and management organization and staffing.

(5) Implementation sequence

- Step 1. Preliminary exchange between Oshorn and recipient to establish mutual interest.
2. Preliminary survey visit to establish specific parameters of requirements.
3. Preparation and submission of written survey report and proposals.
4. Negotiation and finalization of proposals, financial, commercial and contractual terms.
5. Invitation for recipient to visit Oshorn to see and discuss the pertinent technology and its utilization.
6. Oshorn to supply reports, documentation, manual instructions, instruments.
7. Oshorn to provide and/or arrange for expert assistance.
8. Oshorn to train recipient personnel in such techniques, procedures and practices.
9. Oshorn to oversee project operation on contractual basis.

Commercial policy

Step 1 will involve no expense to the recipient.

Steps 2, 3, 4 and 5 will be carried out on an individual fee plus expenses basis in accordance with requirements.

Steps 6, 7, 8 and 9 will be carried out on an individual fee plus expenses basis in accordance with requirements and in addition will be open to consideration of royalty arrangements.

4/3
AUSTRIA

EXTRACTION OF COPPER BY FUSION OF ALUMINUM

Developed by: Metallwerk, SAUERBREM-ERNDLICH AG, A-5020 Imst/Innsbruck, Austria; Title: VERFAHREN ZUR ERHALTUNG DER ERZE; Contact: Dr. Karl F. Erndl (Manager, Metallwerk); Address: Imst, Austria; Dr. Karl F. Erndl (Sales Manager)

Development: Metallwerk, manufacturer of aluminum and aluminum products and semi-finished copper and copper alloy products in Austria; Capital: A 410 million; Revenue: \$10 million; No. of employees: 4,000; Main nature of business: Production of base, refined and alloyed copper, aluminum, and its alloys.

In the manufacture of extruded metal rods, tubes, and sections, the die quality is of great importance. Improved dies are not always satisfactory, and it is desirable for an aluminum extrusion plant to have its own die-making facility.

Review applicant is well-versed in the art of die-making, design and erection of modern die-making facilities, and has developed a number of machine tools and auxiliary equipment, aiming on manufacturing methods and tool design, operation of plant layout, advance on the materials, etc.

Subject is available for information.

4/4
GERMANY

RESEARCH ON COPPER COPPER-NICKEL COPPER-NICKEL-SILVER

Developed by: Metallwerke, Eisen- und Stahlwerke, Germany; Title: ...; Contact: Mr. ...; Address: ...; Dr. ... (Director of Production Engineering Department)

Work: Part of Department for Metallurgische Forschung, GDR, (Central Organization for Applied Scientific Research); Annual budget: \$0.75 million (1970); No. of employees: 1,000. Main nature of business: Research and development.

Review applicant covers the design and construction of experimental apparatus for the study of the extraction of copper from copper-nickel-silver, nickel, and copper-nickel-silver, and the study of the extraction of copper from copper-nickel-silver, nickel, and copper-nickel-silver.

- 1. The cost of the research and development of the Metal Research Institute (GDR) will be about \$10 per person per month.
- 2. The cost of the research and development of the Metallwerke will be about \$10 - \$15 per person per month, including the cost of materials and the cost of the research and development.
- 3. Additional experimental materials and the necessary services for the research and development in the countries where the applicant has a branch office, including the cost of the materials, are in the range of about \$1,000 per year.

4/5
CANADA

EXTRACTION OF COPPER-NICKEL COPPER-NICKEL

Developed by: ...; Title: ...; Contact: Mr. ...; Address: ...; Dr. ... (Manager, New Metal Products Ltd.)

Business: Manufacturing and refining of copper and nickel; Sales: Over \$200 million; No. of employees: 10,000; Main nature of business: Copper and lead mining, refining and smelting.

Research for extraction of copper and nickel from base alloys. Researcher's extraction and other operations have been established which allow the recovery of copper and nickel in commercial and economical.

Early extraction of copper and nickel from base alloys for further purification; this method is a potential method for the future.

Industry offers nickel extraction from copper-nickel alloys, with all technology available for alloy production, metal production, extraction, refinement and the preparation.

Material	Input (kg)	Output (kg)	Loss (kg)	Efficiency (%)
Copper	100	95	5	95
Nickel	100	90	10	90
Aluminum	100	95	5	95
Other	100	95	5	95

*Research and Trade Work, Canada Ltd.

- (c) Appropriate terms will be developed to protect interested parties in the use of know-how, patents, and unproven know-how, patents, know-how, and utilization engineering skills.
- Possibilities are work on a contract basis, production license, or other arrangements, depending on specific situations. Financial arrangements shall be established for each situation, on a case-by-case basis, via letters of credit.
- Expert assistance and operator training for Extrakol is also available.

Sintered
4/6
PAGE

(1) LIGHT-ALLOY SECTIONS FOR METAL CURTAINS (WINDOW FRAMES) MAINS

(2) COCEGAR-BECHINEY, 11 Avenue Marceau, Paris 8^e, France; (later: Cocedat-Bechiniy; Telex: 22 264; Phone: 220 50 50; Contact: A. Trepat (Head, Technical Assistance Department)).

(3) Private; Major French non-ferrous metals producer; Capital: 1.150 million; Sales: 1,700 million; No. of employees: 1,900; Main nature of investment: Large transformation of aluminum: rolling, drawing and extrusion of all wrought aluminum alloys.

(4) The technology available concerns the production by extrusion of sections of all types, in aluminum and alloys such as Al-Mg-Si.

The know-how covers all or part of the following:

- Mastery of appropriate alloys
- Design of sections
- Extrusion techniques
- Exploitation of materials (especially productivity)
- Heat treatment
- Quality control
- Design and production of dies (Plain, parabolic, extruded, spider dies)

The experience of Cocedat-Bechiney is derived not only from its major French plants, but also from similar operations in foreign subsidiaries, and means that the company is equipped to provide the best solution for each local situation.

(5) The products of this technology are most commonly used in metal structures: Partitions of windows, doors, movable partitions, glazing elements, curtain walls, etc. They are also used for decorative purposes, in transport (trucks, etc.), etc.

(6) Cocedat-Bechiney can offer the following assistance and know-how, in part or complete:

- Feasibility studies
- Assistance in setting up realistic manufacturing programmes
- Selection of basic equipment
- Specification of equipment and tendering instructions to tender
- Preliminary evaluation of tenders
- Assistance in selection of supplier
- Planning and layout of plants
- Advice on auxiliary equipment
- Supervision of installation of equipment
- In-plant training
- Commissioning
- Operational planning
- Advice on expansion of existing plant
- Know-how on new products

Sintered
4/7
PAGE

(1) FABRICATION OF PIPES BY EXTRUSION AND COLD DRAWING

(2) TUBACEX, C.E. de TUBOS por EXTRUSION S.A., Barrio Garcia s/n. Llodio (Alava), Spain; Telex: 2154 TUBEX-E; Phone: 20800; Contact: Mr. Xavier H. Fernandez (Director General).

(3) Private; Capital: Ptas 75 million; No. of employees: 284; Main nature of business: Fabrication of pipes without welding.

(4) Fabrication of steel tubes without welding of carbon and alloy steels, by means of the process derived from conventional and continuous cast billets. The production comprises a range of tubes from 10 to 100 millimetres of outer diameter, with a great variety of thicknesses.

(5) Carbon and alloy cold-drawn types are used in the production of boiler tubes and heat exchangers.

(6) Normally we follow the royalty policy, but we can also analyze other conditions. Financial agreements shall be established for each situation, on a case-by-case basis, via letters of credit.

GROUP 5 - ROLLING

Reference No.

5/1

AUSTRIA

(1) ROLLING OF ALLOY AND SPECIAL STEELS

(2) Werk. Böhler and Co. AG, Donnerstr. 1, A-1011 Vienna, Austria; Office: StadlWöhler-Wien; Telex: 1102, 1103; Telex: 1102-1103; Contact: Mr. W. Kraus, Ausrüst. Böhler and Co. AG, 1. Austria Foreign Office, A-1011 Vienna, Austria, Vienna.

(3) Governmental; Equipment: of alloy and alloy steels; No. of employees: 11,500; Capital: 300 million; Main products: production of alloy and special steels in various forms and standards.

(4) Complete knowhow for planning and layout of rolling mills (reforming and roughing mills, hot and cold mills, steel and strip mills) for areas of interest of all groups.

Special knowhow for manufacturing operations, covering control operations, heat treatment, conditioning and hardening, etc.

Training of personnel in Böhler works.

Provision of Böhler experts for technical assistance in recipient's works, e.g. supervision of production operation, trouble-shooting in production operation, etc.

(5) Maintenance of knowhow agreement for specified period. Knowhow and knowhow normally supplied on royalty basis, with additional maintenance. License agreement can also be supplied, subject to conditions of sale.

Reference No.

5/2

UNITED KINGDOM

(1) GOLD ROLLING OF SPECIAL STEELS

(2) BROOKHURST WIPES LTD., (The Brookhurst Organisation), Brookhurst Road, West Bromwich, Staffs., United Kingdom; Telex: Brook W West Bromwich 2001; Telex: 01-20 2001; Contact: Mr. R. Laird (General Manager).

(3) Private; Range of group of companies producing pipes, forgings, and sheet products in steel, alloy, and non-ferrous metals, together with a range of engineering products, including bearings, tools, forgings, transmission components, constructional castings, etc.; No. of employees: 2,000 (group); Capital: £10 million; Sales: £5 million; Main markets of products: International.

The production of gold forming steels and other alloys for rolling was pioneered in the country by this Company more than thirty years ago.

Rolling machine products covering the complete line from cold-chamber die-casting to hot-rolling mills until the final stage of finishing.

Rolling steels are manufactured in coils, and also in flat sheets of pre-oxidized strip (e.g. line, electro-line, tinplate and plating base metal), and the finishing plant will produce from material up to 24 in. (600 mm) width and up to 100 ft length. Best of other products are manufactured in coils.

They can be supplied in finished or semi-finished components in which punching, shearing, cutting, rolling, welding and other processes are to be included. They can also be supplied curved, spliced and in special lengths and shapes.

(4) Gold rolling process has a very wide field of application for alloy steels incorporating the use of alloy metal as being made it is quite possible that a cold-rolled section can fulfil the requirement. It is possible to obtain surface conditions within the industry, resulting in lighter weight with a length of a few feet.

(5) The company offers the following:

1. Licensed manufacture.
2. Training (on a fee basis).
3. Joint venture.

Reference No.

5/3

FRANCE

(1) VAN DER WERF STEEL ROLLING EQUIPMENT

(2) Van der Werf, Van der Werf, Paris, France; Office: Van der Werf, Paris; Telex: 1102, 1103; Telex: 1102-1103; Contact: Mr. J. Van der Werf, Technisch Afdeling Van der Werf.

(3) Private; Range of products: rolled metal (carbon steel, alloy steel, stainless steel, etc.); No. of employees: 100; Capital: 100 million; Main products: production of alloy and special steels in various forms and standards.

- (4) The technology available applies to all or part of the following:
- The manufacture of hot-rolled products, flat or coiled, for subsequent cold-rolling, such as finished plates, up to 120 mm thick.
 - The cold-rolling of sheet or strip of 0.5 mm thickness and less.

These operations can be carried out in reversing or non-reversing mills, in tandem trains, or two-stand mills, etc. Width can be up to 2,500 mm.

The experience of Cogemur-Technique is derived not only from its major French plants, but also from its past operations in foreign subsidiaries, and means that the company is equipped to provide the best solution for each local situation.

- (5) There are many applications for these products:
- Medium and heavy gauge sheet for the aircraft industry.
 - Coiled strip as raw material for foil production.
 - Special quality strip for the production of coated containers for the food industry, laminating, etc.
 - Plates, discs, blanks for stamping and spinning.

(6) Cogemur-Technique can offer the following assistance and knowhow, in part or complete:

- Basic technological documentation.
- Assistance in setting up scientific manufacturing programmes.
- Selection of basic equipment.
- Specification of equipment and issuing invitations to tender.
- Preliminary evaluation of tenders.
- Assistance in selection of supplier.
- Planning and layout of plants.
- Advice on ancillary equipment.
- Supervision of installation of equipment.
- In-plant training.
- Commissioning.
- Operational planning.
- Advice on expansion of existing plant.
- Knowhow on new products.

Reference No.

5/4

UNITED STATES OF AMERICA

- (1) HOT ROLLING OF STEEL
- (2) LUKENS STEEL COMPANY, Strode Avenue, Gettysville, Pa. 17320, Unit of United States Steel Corporation; Telex: 24294; Phone: (412) 833-2171/0000; Contact: Mr. Leonard Lown (International Manager).
- (3) Private; Sales (1971): \$3.12,127,000; No. of employees: 20; Main nature of business: Speciality plate steel producer and fabricator.

(4) Lukens Steel Company has for many years served the metal-user industries with fabricated components, using various methods of hot forming. One of the processes used is that of rolling. In many cases, the design and production of special equipment and tools have been necessary.

As a result of this long background of training, development and experience, Lukens specialists are fully able to transfer their specialized technological knowhow in the field of rolling to interested recipients.

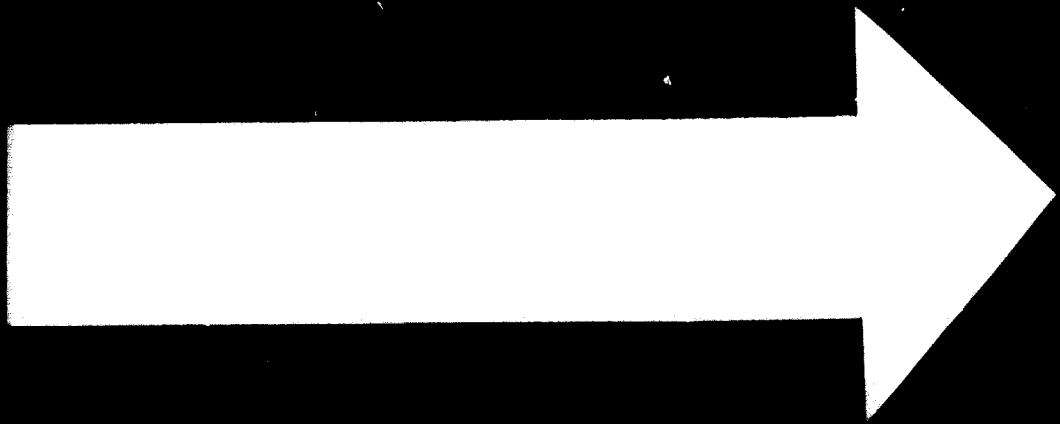
- (5)
1. Lukens Steel Company can transfer the technology via expert technicians at recipient's plants, in the form of lectures, individual instruction, use of operational data, analysis of applications, etc., designed to develop personnel in the techniques of engineering and the application of the speciality in question.
 2. The following financial arrangements are possible:
 - a. Lump-sum payment in advance (based on estimate of time and/or man-hours and/or other prevailing rates).
 - b. Contractual arrangements. The recipient pays Lukens an agreed sum for the full term of the contract and not more than ten years, with payments in quarterly instalments starting at the effective date of the agreement.
 - c. All payments in US currency to a New York bank, without any retention of taxes.

Reference No.

5/5

ITALY

- (1) ROLLING OF ALUMINIUM AND ITS ALLOYS
- (2) KONTREAVINI EDIZIONE S.p.A., Viale Mazzini 10, I-20133 Milano, Italy; Telex: 32011; Phone: 02/575111; Contact: Mr. Giancarlo Contreavini (Process and Product Development - DIMS), Kontreavini Edizione S.p.A., Viale Mazzini 10, Milano.
- (3) Private; Capital: Lit 40,000,000; Sales (1971): Lit 1,200,000,000; No. of employees: 52,000; Main nature of business: Manufacturer of aluminium and aluminium alloys.

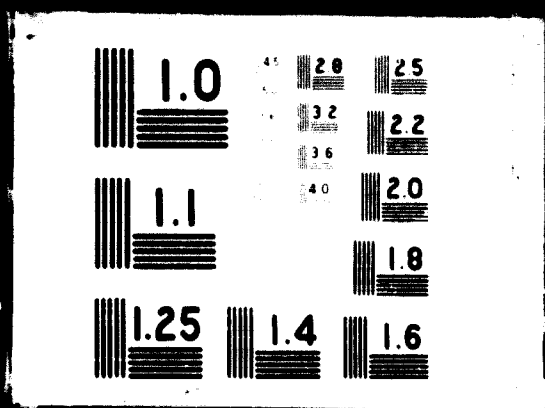


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GROUP 5 - ROLLING

Form No.

5/1

PLANS

1. General Notes:

1.1. Reference: See Section 5/1 of the Rolling Schedule for a complete list of materials and specifications.

1.2. Workmanship: All work shall be done in accordance with the Rolling Schedule and the Rolling Specifications.

1.3. Quality Control: The Contractor shall be responsible for the quality control of all materials and workmanship.

1.4. Inspection: The Contractor shall allow the Inspector to inspect all work at any time during the progress of the work.

1.5. Rejection: Any materials or workmanship found to be defective shall be rejected and replaced at the Contractor's expense.

1.6. Protection: The Contractor shall be responsible for the protection of all existing structures and utilities.

1.7. Cleanliness: The Contractor shall keep the work area clean and free of debris.

1.8. Safety: The Contractor shall be responsible for the safety of all workers and the public.

1.9. Insurance: The Contractor shall be responsible for the insurance of all workers and equipment.

1.10. Permits: The Contractor shall be responsible for obtaining all necessary permits.

1.11. Access: The Contractor shall be responsible for providing access to all areas of the site.

1.12. Storage: The Contractor shall be responsible for the storage of all materials and equipment.

1.13. Disposal: The Contractor shall be responsible for the disposal of all waste materials.

1.14. Records: The Contractor shall be responsible for maintaining all records of the work.

1.15. Final Inspection: The Contractor shall be responsible for the final inspection of the work.

1.16. Completion: The Contractor shall be responsible for the completion of the work.

Form No.

5/2

PLANS

2. General Notes:

2.1. Reference: See Section 5/2 of the Rolling Schedule for a complete list of materials and specifications.

2.2. Workmanship: All work shall be done in accordance with the Rolling Schedule and the Rolling Specifications.

2.3. Quality Control: The Contractor shall be responsible for the quality control of all materials and workmanship.

2.4. Inspection: The Contractor shall allow the Inspector to inspect all work at any time during the progress of the work.

2.5. Rejection: Any materials or workmanship found to be defective shall be rejected and replaced at the Contractor's expense.

2.6. Protection: The Contractor shall be responsible for the protection of all existing structures and utilities.

2.7. Cleanliness: The Contractor shall keep the work area clean and free of debris.

2.8. Safety: The Contractor shall be responsible for the safety of all workers and the public.

2.9. Insurance: The Contractor shall be responsible for the insurance of all workers and equipment.

2.10. Permits: The Contractor shall be responsible for obtaining all necessary permits.

2.11. Access: The Contractor shall be responsible for providing access to all areas of the site.

2.12. Storage: The Contractor shall be responsible for the storage of all materials and equipment.

2.13. Disposal: The Contractor shall be responsible for the disposal of all waste materials.

2.14. Records: The Contractor shall be responsible for maintaining all records of the work.

2.15. Final Inspection: The Contractor shall be responsible for the final inspection of the work.

2.16. Completion: The Contractor shall be responsible for the completion of the work.

3. Notes:

3.1. General: The Contractor shall be responsible for the general supervision of the work.

3.2. Materials: The Contractor shall be responsible for the procurement of all materials.

3.3. Equipment: The Contractor shall be responsible for the procurement of all equipment.

3.4. Manpower: The Contractor shall be responsible for the procurement of all manpower.

3.5. Time: The Contractor shall be responsible for the completion of the work within the specified time.

3.6. Cost: The Contractor shall be responsible for the cost of the work.

3.7. Quality: The Contractor shall be responsible for the quality of the work.

3.8. Safety: The Contractor shall be responsible for the safety of all workers and the public.

3.9. Insurance: The Contractor shall be responsible for the insurance of all workers and equipment.

3.10. Permits: The Contractor shall be responsible for obtaining all necessary permits.

3.11. Access: The Contractor shall be responsible for providing access to all areas of the site.

3.12. Storage: The Contractor shall be responsible for the storage of all materials and equipment.

3.13. Disposal: The Contractor shall be responsible for the disposal of all waste materials.

3.14. Records: The Contractor shall be responsible for maintaining all records of the work.

3.15. Final Inspection: The Contractor shall be responsible for the final inspection of the work.

3.16. Completion: The Contractor shall be responsible for the completion of the work.

Form No.

5/3

PLANS

4. General Notes:

4.1. Reference: See Section 5/3 of the Rolling Schedule for a complete list of materials and specifications.

4.2. Workmanship: All work shall be done in accordance with the Rolling Schedule and the Rolling Specifications.

4.3. Quality Control: The Contractor shall be responsible for the quality control of all materials and workmanship.

4.4. Inspection: The Contractor shall allow the Inspector to inspect all work at any time during the progress of the work.

4.5. Rejection: Any materials or workmanship found to be defective shall be rejected and replaced at the Contractor's expense.

4.6. Protection: The Contractor shall be responsible for the protection of all existing structures and utilities.

4.7. Cleanliness: The Contractor shall keep the work area clean and free of debris.

4.8. Safety: The Contractor shall be responsible for the safety of all workers and the public.

4.9. Insurance: The Contractor shall be responsible for the insurance of all workers and equipment.

4.10. Permits: The Contractor shall be responsible for obtaining all necessary permits.

4.11. Access: The Contractor shall be responsible for providing access to all areas of the site.

4.12. Storage: The Contractor shall be responsible for the storage of all materials and equipment.

4.13. Disposal: The Contractor shall be responsible for the disposal of all waste materials.

4.14. Records: The Contractor shall be responsible for maintaining all records of the work.

4.15. Final Inspection: The Contractor shall be responsible for the final inspection of the work.

4.16. Completion: The Contractor shall be responsible for the completion of the work.

(4) Nippon Steel started the commercial production of new products in 1970 to render the following technical assistance:

1. Comprehensive design plan of the new products.
2. New manufacturing steps:
 - (a) Operating technique.
 - (b) Roll design.
 - (c) Improving of production facilities.
 - (d) Quality control and inspection.

Reference No.

5/24

JAPAN

- (1) SPIRAL LINE TYPE
- (2) NIPPON STEEL CORPORATION, 1-1-1 Ohtaishi, Chuo-ku, Tokyo, Japan; Tel: 3-21-1111; NIPPON STEEL TOKYO; Telex: 3151; Home: 3-21-1111; Contact: Mr. Masaharu (Director).
- (3) Private; Capital: \$40.7 million; Sales: \$1,120 million; No. of employees: 50,000; Main nature of business: Manufacturer and distributor of various steel products and business incidental thereto.

(4) Nippon Steel's equipment capable of manufacturing spiral line pipe with wall thickness of 0.7%O in a maximum diameter of 1600 mm, with a maximum length of 12000 mm. Nippon Steel is ready to render the technical assistance in connection with the installation, maintenance and operation of the equipment for manufacturing spiral line pipe.

Reference No.

5/25

JAPAN

- (1) AUTOMATIC MARKING EQUIPMENT
- (2) NIPPON STEEL CORPORATION, 1-1-1 Ohtaishi, Chuo-ku, Tokyo, Japan; Tel: 3-21-1111; NIPPON STEEL TOKYO; Telex: 3151; Home: 3-21-1111; Contact: Mr. Masaharu (Director).
- (3) Private; Capital: \$40.7 million; Sales: \$1,120 million; No. of employees: 50,000; Main nature of business: Manufacturer and distributor of various steel products and business incidental thereto.

(4) Nippon Steel has various types of marking equipment:

1. Sheet Printer - This equipment can print a mark on the sheet continuously and continuously with high speed of 400 m/min.
2. Mark Selecting Type Sheet Printer - This equipment can print a mark on the sheet of several marks can be printed by providing with the mark.
3. Coil Printer - This can be used for the marking coil strip. Marking patterns can be changed easily.
4. Printer for Pipe or Round Shape Material.
5. Numbering Printer.

Reference No.

5/26

JAPAN

- (1) LIGHT GAUGE COLD ROLL FORMER
- (2) NIPPON STEEL CORPORATION, 1-1-1 Ohtaishi, Chuo-ku, Tokyo, Japan; Tel: 3-21-1111; NIPPON STEEL TOKYO; Telex: 3151; Home: 3-21-1111; Contact: Mr. Masaharu (Director).
- (3) Private; Capital: \$40.7 million; Sales: \$1,120 million; No. of employees: 50,000; Main nature of business: Manufacturer and distributor of various steel products and business incidental thereto.

(4) In accordance with rapid increase of light gauge structural steel, Nippon Steel has introduced an accurate cold roll forming and cutting line.

1. Forming speed: 150m-200m/min.
2. Accuracy of cutting length: $\pm 0.5\%$
3. Exchanging time of forming stand or line of cutting machine: 1.5 hours.

Reference No.

5/27

JAPAN

(1) **SINGLE PLANETARY ROLLING MILL AND STEEL ROLLING TECHNOLOGY**

(2) **YAMATO STEEL CO., LTD.**, Sakai-ku, 11-20, Nishiki 2-chome, Naniwa-ku, Nagasaki, Japan; **Telex:** 314-111; **Phone:** 095-241111; **Contact:** Mr. Shirohichi Nakagawa.

(3) **Private;** **Capital:** 1,000,000,000 Yen; **Assets:** 1,000,000,000 Yen; **No. of employees:** 200; **Main nature of business:** Production and sale of special steel (flat, wide, narrow strip, forgings, castings).

(4) Compared with conventional steel mill or, and the special equipment of the Single Planetary Mill, rolling mills of conventional type have with mills of planetary design. In this new design, only one planetary roll is employed on lower side with a roller top mill.

The features of the Single Planetary Mill include:

- (1) Easy operation and maintainable with a small installation, which makes the machine particularly suitable for automation of various aspects of operation.
 - (2) Accessibility to strict control of work-piece temperature on account of compact design.
 - (3) High reduction with one pass, with accompanying economy in number of mill stands.
 - (4) Versatility in reduction and temperature conditions permits production of steel of extremely uniform fine metallic structure.
- (5) **Advantages:** (a) Small installation with a low initial cost, (b) regularity of both of them, (c) easy to maintain, (d) simple, (e) easy to operate, (f) easy to train at our plant.

Reference No.

5/28

JAPAN

(1) **SHIPPEN STEEL CO. MANUFACTURING: RAILS**

(2) **SHIPPEN STEEL CORPORATION**, 1-1 Chiyoda-1-chome, Chiyoda-ku, Tokyo, Japan; **Telex:** 31101; **Phone:** 3-4111; **Contact:** Mr. Kawato Okaki (Director).

(3) **Private;** **Capital:** ¥200 million; **Assets:** ¥400 million; **No. of employees:** 20,000; **Main nature of business:** Manufacture and sale of iron and steel and of chemical products and inorganic inorganic products.

(4) Shippen Steel Corporation produces the manufacture of rails by universal rolling method. Shippen Steel produces other large-scale products such as structural steel, pipes and sheets and also well as current transformers, etc., including a concrete bridge, etc., in Japan.

Advantages of our plant are: (a) simple manufacturing, (b) Shippen Steel.

Reference No.

5/29

JAPAN

(1) **PRODUCTION TECHNOLOGY OF RAILS: TRACK ROLLING MILL, RAILS, AND TRACKS**

(2) **YAMATO STEEL CO. LTD.**, 11-20, Nishiki 2-chome, Naniwa-ku, Nagasaki, Japan; **Telex:** 314-111; **Phone:** 095-241111; **Contact:** Mr. Shirohichi Nakagawa.

(3) **Private;** **Capital:** 1,000,000,000 Yen; **Assets:** 1,000,000,000 Yen; **No. of employees:** 200; **Main nature of business:** Production and sale of special steel (flat, wide, narrow strip, forgings, castings, rolling steel parts and forgings).

- (4) 1. Production technology of wheel and axle, including hot working, heat treatment and machining.
2. Production of parts of tracks and fabrication of tracks.

- (5) 1. Engineering service at the construction of production facilities (including design and construction).
2. Technical assistance of operation and quality control.
3. Training at our plant in Japan.

GROUP 6 - TUBEMAKING

6/1

(1) MANUFACTURE OF STEEL TUBES

- (2) **DAIMIER S.p.A.**, Via Broletto 14, Milano, Italy; Capital: 100 billion; Revenue: 100 billion; Employees: 10,000; Contact: **Ing. Raffaele Rovina** (Vice General Mgr.).
- (3) Mixed; Major share-holder company; Capital: 100 billion; Revenue: 100 billion; Employees: 10,000; Main nature of business: Manufacture of welded and seamless tubes.
 - (4) 1. Bottom-rolling of tube ingots
 - 2. Manufacture of electric resistance-welded (ERW) and continuous cast-welded (CCW) pipes and tubes
 - 3. Cold drawing
 - 4. Manufacture of seamless central and tapered pipes
 - 5. Manufacture of gas cylinders
 - 6. Hot-dip coating and cathodic protection of tubes
- (5) Design of equipment, training for administrators and personnel and other aspects of plant & equipment. The specific terms and conditions involved will depend on the particular application.

6/2

(1) FABRICATION OF ALUMINIUM ALLOY TUBES

- (2) **MONTEDISON EDISON S.p.A.**, Foro Buonaparte 41, P.O. Box 200, Milano, Italy; Capital: Montedison; Telex: 3100; Phone: 2000; Contact: **Dr. Robert Frangone** (Manager, Research and Product Development - DIMM), Montedison Edison S.p.A., Foro Buonaparte 41, Milano.
- (3) Private; Capital: Lit 340 billion; Sales (1970): 100 billion; No. of employees: 10,000; Main nature of business: Manufacture of chemicals, metals and ferrous alloys.
- (4) Fabrication of aluminum alloy tubes, pipes, etc. by seam-welding process. The weld is rolled out separately to restore the original properties of the alloy.
- (5) Irrigation tubes, pipelines for water, air, etc.
- (6) Licensing arrangements against payment of lump sum covering expenses incurred with transfer of technology plus annual royalty - to be negotiated with recipients. Training of technical personnel who will be in charge of plant operation. Technical assistance for technical transfer as starting a plant.

6/3

(1) PRODUCTION OF THIN-WALLED COPPER AND ALUMINUM TUBES BY PILGER ROLLING AND DRAWING IN COILS

- (2) **Vereinigte Metallwerke RANSHOFEN-BERNECHEN**, Fabrikstrasse 4, A-1000 Amstetten, Austria; Capital: IMW Amstetten; Telex: 3200 (Germany); Phone: 0043 4272 2100; Contact: **Dr. Maria Bauer** (Sales Director), OM Ranshofen-Bernschan AG, A-1000 Vienna/Ranshofen, Austria.
- (3) Governmental; Leading producer and manufacturer of aluminum and aluminum products and semi-finished copper and copper alloy products in Austria; Capital: 300.0 million; Revenue: 300.0 million; No. of employees: 1000; Main nature of business: Production of tube, bar, and sections in copper, aluminum, and its alloys.

(4) Cold pilger rolling

Based on rolling of bloom between calibrated rolls, stretching material lengthwise under a large diameter roller.

Max. dia. of billet:	70 mm
Wall thickness:	3 mm for copper 2 mm copper alloys
Finished sizes:	30 mm dia., 1.1 mm wall 6 mm dia., 1.0 mm wall
Feed section:	3 - 17 mm (depending on alloy)
No. of strokes per min:	140
Coolant/Lubricant:	Emulsion 1:10

Drawing of tubes in coils

The tube discharged from the pilger will be further reduced on the mill to the required diameter. Resulting product has accurate size and good inner surface finish.

Tube can be produced with finished diameters of 6 mm and 6.5 mm with wall thicknesses of 1.0 mm and 1.1 mm.

Known available covers: drawing sequences, the layout, heat treatment, and other details.

Reference is made to the report of the International Trade Commission, dated 1964, on the subject of "The State of the World Textile Industry."

The following information is being furnished for your information:

6/4

A 3-11A

TEXTILE INDUSTRY - AUSTRIA

WABER-ALTRAMMBAUER, located at the factory, A-1100 Vienna, Austria; Contact: Director Waber; Telex: 111-111; Phone: 111-111; Contact: Mr. Otto Mauer (Sales Management).

Industry: Textile; Nature of business: Manufacture of plastic and synthetic fibers.

1) The works will be concerned with the following areas of technical and financial equipment. This includes:

- All types of plant and equipment
- Machinery, tools, etc.
- Design of tools
- Training of operators by Austria or abroad
- Technical assistance at recipient's plant

The manufacturer provides start-up assistance; they are extended to local and external and internal technical assistance and maintenance.

2) Equipment, materials, tools, etc. are provided, etc.

3) Design and construction. Specialization for technical assistance. Will consist of design, erection and initial operation of a new plant.

Reference is made to the report of the International Trade Commission, dated 1964, on the subject of "The State of the World Textile Industry."

6/5

A 3-11A

TEXTILE INDUSTRY - JAPAN

YAMAGUCHI, located at the factory, Japan; Contact: Mr. Shiro Yamaguchi (Director-Manager, Dept. of Textiles, Yamaguchi Prefecture, Yamaguchi 750-0000).

Industry: Textile; Nature of business: Manufacture of synthetic fibers, etc.

1) The works will be concerned with the following areas of technical and financial equipment, etc. This includes: design, erection and initial operation of a new plant; design, erection and initial operation of a new plant; design, erection and initial operation of a new plant.

2) Equipment, materials, tools, etc. are provided, etc.

3) Design and construction. Specialization for technical assistance. Will consist of design, erection and initial operation of a new plant.

4) Design and construction. Specialization for technical assistance. Will consist of design, erection and initial operation of a new plant.

6/6

A 3-11A

TEXTILE INDUSTRY - HUNGARY

REBER, SZABO AND NEHALKOPF, located at the factory, Budapest, Hungary; Contact: Mr. Reber; Telex: 111-111; Phone: 111-111; Contact: International Commercial Relations Department.

Industry: Textile; Nature of business: Laundry and textile services.

1) The works will be concerned with the following areas of technical and financial equipment, etc. This includes: design, erection and initial operation of a new plant; design, erection and initial operation of a new plant; design, erection and initial operation of a new plant.

2) Equipment, materials, tools, etc. are provided, etc.

3) Design and construction. Specialization for technical assistance. Will consist of design, erection and initial operation of a new plant.

6/7

- (1) **EXPERIMENTAL STUDY OF THE EFFECTS OF THERMAL TREATMENT ON THE MECHANICAL PROPERTIES OF ALUMINUM ALLOYS**
- (2) **ALUMINUM ALLOYS**, Alcoa Aluminum, Dept. 100, P.O. Box 291, Pittsburgh, PA, U.S.A.; Telex: 15110; Phone: 412-781-1000; Contact: Mr. J. W. Johnson (Research and Development).
- (3) Experimental; Major engineering product; Main nature of business: Aluminum and aluminum alloys.
- (4) Complete knowledge of latest, the control and the effects of thermal treatment on the mechanical properties of aluminum alloys. This knowledge is to be used for the design of aluminum alloys. The knowledge is to be used for the design of the mechanical properties and deformation, and for the design of the mechanical properties.
- (5) Complete knowledge of the control and the effects of thermal treatment on the mechanical properties of aluminum alloys. This knowledge is to be used for the design of aluminum alloys. The knowledge is to be used for the design of the mechanical properties and deformation, and for the design of the mechanical properties.

6/8

- (1) **EXPERIMENTAL STUDY OF THE EFFECTS OF THERMAL TREATMENT ON THE MECHANICAL PROPERTIES OF ALUMINUM ALLOYS**
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- (3) Experimental; Major engineering product; Main nature of business: Aluminum and aluminum alloys.
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6/9

- (1) **EXPERIMENTAL STUDY OF THE EFFECTS OF THERMAL TREATMENT ON THE MECHANICAL PROPERTIES OF ALUMINUM ALLOYS**
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- (3) Experimental; Major engineering product; Main nature of business: Aluminum and aluminum alloys.
- (4) Complete knowledge of the control and the effects of thermal treatment on the mechanical properties of aluminum alloys. This knowledge is to be used for the design of aluminum alloys. The knowledge is to be used for the design of the mechanical properties and deformation, and for the design of the mechanical properties.
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6/10

- (1) **EXPERIMENTAL STUDY OF THE EFFECTS OF THERMAL TREATMENT ON THE MECHANICAL PROPERTIES OF ALUMINUM ALLOYS**
- (2) **ALUMINUM ALLOYS**, Alcoa Aluminum, Dept. 100, P.O. Box 291, Pittsburgh, PA, U.S.A.; Telex: 15110; Phone: 412-781-1000; Contact: Mr. J. W. Johnson (Research and Development).
- (3) Experimental; Major engineering product; Main nature of business: Aluminum and aluminum alloys.
- (4) Complete knowledge of the control and the effects of thermal treatment on the mechanical properties of aluminum alloys. This knowledge is to be used for the design of aluminum alloys. The knowledge is to be used for the design of the mechanical properties and deformation, and for the design of the mechanical properties.
- (5) Complete knowledge of the control and the effects of thermal treatment on the mechanical properties of aluminum alloys. This knowledge is to be used for the design of aluminum alloys. The knowledge is to be used for the design of the mechanical properties and deformation, and for the design of the mechanical properties.

- (1) Engineering studies, rollers for rolling mills, hydraulic press frames, various castings for the mechanical engineering industry, etc.
 - (2) - License of know-how agreement for a specified period covering all engineering studies for the extension of the existing plant.
 - License of know-how and technical assistance agreements for specified periods with supply of basic technical drawings, training of personnel in Creusot-Loire's works, reputation of Creusot-Loire's technical staff, maintenance of the installations and for initial production period.
- Particulars:
- Royalty fee
 - Technical know-how normally supplied against cash payment (lump-sum) plus royalties.

Reference No.
6/11
JAPAN

- (1) RESEARCH ON INITIAL ALUMINUM WELDED JOINTS
- (2) KAWAGAKI STEEL CORPORATION, 11 Yaraku-cho 1-chome, Chiyoda-ku, Tokyo, Japan; Cable: KAWAGAKI STEEL; Telex: 0012-201; "SHINJITSU SHOKU"; Contact: Mr. Yuzo Ikeda (General Manager)
- (3) Private; Capital: \$10,000,000; Sales: \$30,000,000; No. of employees: 20,000; Main nature of business: Iron and Steel Manufacturer.
- (4) Detailed drawings for various stages are filed from the receipt of hot-rolled coils to the final delivery of welded heavier electric resistance welded pipes or rollers.
- (5) We are ready to negotiate for detailed conditions mentioned above depending upon specific interest of inquirers, taking into consideration time, scale and manufacturing facilities of their projects.

Reference No.
6/12
JAPAN

- (1) MANUFACTURE OF TAPERED POLES
- (2) NIPPON KOKAN K.K., 1-1-1, Minamiwatarai-cho, Kawasaki, Japan; Cable: STEELTUBE TOKYO; Telex: 0012-201; Phone: 044-2-1111; Contact: Mr. Saburo Yamada (General Manager)
- (3) Private; Capital: \$100 million; Sales: \$100,000 million; No. of employees: over 10,000; Main nature of business: Fabricating; Annual capacity - 100,000 metric tons; Steelmaking; Annual crude steel capacity - 1.5 million metric tons; Annual output: Annual capacity raw material - 1.5 million metric tons.
- (4) Tapered poles used as lightning poles have posed various difficulties in the manufacture because of the unique manufacturing. Nippon Kokan has developed its original know-how for the production from a special cutting method of material plates for the production. This permits successful manufacture of satisfactory tapered poles at a high efficiency. All the manufacturing technology and facilities for this purpose including the above-mentioned know-how can be provided.
- (5) Supplying know-how (patent rights). Training of personnel.

Reference No.
6/13
JAPAN

- (1) PRODUCTION TECHNOLOGY OF STRAINING BEAM WELDED PIPE BY ROLL BENDING
- (2) SUMITOMO METAL INDUSTRIES LTD., 11 Kitayama 5-chome, Hirashi-ku Osaka, Japan; Cable: SUMITOMOMETAL OSAKA; Telex: 0-490; Phone: 06-220-9111
- (3) Private; Capital: \$10,000,000; Sales: \$100,000,000 (between 1 October 1-31 and 31 March 1971). No. of employees: 20,000 as of end of 1971; Main nature of business: Production and sales of carbon steel rolled in flats, alloy steel rolled products, forgings, castings, rolling stock parts and fabrications.
- (4) 1. Production technology of high tensile pipe (API Standard IX), covering roll forming of steel plate by cold bending press and press roll bending, and submerged arc welding of both inner and outer faces of seam.
- 2. Inspection technology of spiral welded pipe at the production line.
- (5) 1. Engineering service and construction of plant
- 2. Instruction of operation and quality control
- 3. Training of our plant in Japan.

6/14

(1) PRODUCTION TECHNOLOGY OF SPIRAL WELDED PIPE

(2) SUMITOMO METAL INDUSTRIES LTD., 15 Kitamura 1-chome, Higashi-ku, Osaka, Japan
Cable: SUMITOMOMETAL OSAKA; Telex: 33040; Phone: 06-271-1111

(3) Private; Capital: ¥ 1,000,000,000; Sales: ¥ 1,100,000,000 (March 1973);
No. of employees: 2,100 as of end of 1972; Manufacturing
business: Production and sales of carbon steel rolled products, alloy steel rolled
products, forging, casting, rolling stock parts and fabrications.

- (4) 1. Production technology of high test line pipe (API 5L X42), including
continuous spiral forming of hot rolled strip and subsequent longitudinal
of joints.
2. Inspection technology of spiral welded pipe at its manufacturing plant.

- (5) 1. Engineering service and construction of plant
2. Instruction of operation and quality control
3. Training at our plant in Japan.

6/15

(1) PRODUCTION TECHNOLOGY OF ELECTRIC WELDED STEEL PIPE

(2) SUMITOMO METAL INDUSTRIES LTD., 15 Kitamura 1-chome, Higashi-ku, Osaka, Japan
Cable: SUMITOMOMETAL OSAKA; Telex: 33040; Phone: 06-271-1111

(3) Private; Capital: ¥ 1,000,000,000; Sales: ¥ 1,100,000,000 (March 1973);
No. of employees: 2,100 as of end of 1972; Manufacturing
business: Production and sales of carbon steel rolled products, alloy steel rolled
products, forging, casting, rolling stock parts and fabrications.

- (4) 1. High-efficiency production process for electric welded steel pipe
2. Production technology of high-grade steel tube, such as mechanical tubes, boiler tubes,

- (5) 1. Engineering service and construction of plant
2. Instruction of operation and quality control
3. Training at our plants in Japan.

GROUP 7 - POWDER METALLURGY

Reference No.

7/1

RESEARCH

1. TITLE: ...
2. AUTHOR: ...
3. SUBJECT: ...

Reference No.

7/2

RESEARCH
OF AMERICA

1. TITLE: ...
2. AUTHOR: ...
3. SUBJECT: ...

4. Abstract: ...
5. Introduction: ...
6. Methods: ...
7. Results: ...
8. Discussion: ...
9. Conclusions: ...
10. References: ...

Reference No.

7/3

RESEARCH
OF AMERICA

1. TITLE: ...
2. AUTHOR: ...
3. SUBJECT: ...

4. Abstract: ...
5. Introduction: ...
6. Methods: ...
7. Results: ...
8. Discussion: ...
9. Conclusions: ...
10. References: ...

Reference No.

7/4

UNITED KINGDOM

(1) MANUFACTURE BY POWDER METALLURGY OF HARDMETAL CARBIDE TIPS AND TANGS

(2) MAXIMARK METALS LTD., 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

(3) Private; Initial: £ 1,000; Salary: £ 1,000; No. of employees: 10; Nature of business: Manufacture of hardmetal tips and tangs of all sizes.

(4) Complete manufacturing process, includes:

Forming	DM processing
Mixing	Substrate coating
Pressing	Heat treating
Pre-sintering	Grinding
Sintering	Polishing
High-vacuum sintering	

Also advice on plant and space requirements.

(5) Expert assistance and personnel training at every stage of equipment and plant installation. Cost: No. of payment and restricted period of 2 years (to be agreed). Contract: With the recipient. Other: As may be required. Recipients to pay all reasonable expenses (travel, accommodation, insurance, etc.).

Reference No.

7/5

UNITED STATES
OF AMERICA

(1) POWDER METALLURGY TECHNOLOGY

(2) NEW INDUSTRIAL TECHNIQUES INC., 1100 West Orange Park, P.O. Box 111, West Orange, Florida 32090, United States of America; Phone: 904-281-1111; Telex: 904-281-1111; Contact: Mr. L. J. Andreotti (President)

(3) Private; Salary: \$ 2.5 million; No. of employees: 100; Nature of business: Manufacturing process, compact powder metallurgy parts and tooling.

(4) Complete know-how on the manufacture of powder metallurgy (PM) parts:

Design analysis:	Conventional vs PM part sets Cost of starting up PM operation
Design of parts:	Design for most economical production Materials selection Prototype parts
Equipment recommendation, selection, and procurement:	Pre-owned, turn-key, or custom equipment
Tooling:	Tool design, manufacture, and testing
Production:	Location of equipment Materials flow

(5) New Industrial Techniques Inc. propose the following:

Equipment:	Compacting press at cost through affiliate, remainder at cost plus 10%
Tooling:	Design at 10% and procure/manufacture at cost plus 10%
Training:	All key personnel to be trained at NIT plant, plus expert assistance at recipient's plant for annual consulting fee of \$35,000 for one year, \$35,000 for each of the next two years, plus traveling charges and per diem for expert (know-how licensing agreement).

Reference No.

7/6

HUNGARY

(1) PRODUCTION OF IMPROVED GRADES OF MIXED FERROUS FOR USE IN POWDER METALLURGY

(2) RESEARCH INSTITUTE FOR FERROUS METALLURGY, P.O. Box 10, Budapest, Hungary. Phone: 290-020.

(3) Governmental; No. of employees: 100; Main nature of training: Research and development in ferrous metallurgy.

- (2) Electrodeposition of thin coatings of high purity copper, nickel, zinc, and alloys containing substantial amounts of silver, cadmium, lead, tin, bismuth, and others, by means of electrolytic processes.

Process is different in principle and equipment from electrodeposition of pure metal, electrolytic metal plating and electroplating. The process is based on the fact that the components are not concentrated in the same time interval. With this method, particles and the maximum current can be varied. The process can be used for the production of thin metal coatings on a wide variety of materials (e.g., FeMn, FeNi) by electrolytic oxidation.

(3) The thin electrodeposited metal coating can be used as a protective layer.

A thin metal coating on a substrate with a surface area of about 100 to 1000 sq. cm. can result from the use of four amp-hours.

- (4) Electrodeposition of thin coatings of metals and alloys for electrical, electronic, etc. industries.

- (5) General information.

POWER METALLURGY

- (1) GOVERNMENT, Materials Laboratory, Department of Defense, Room 311, Building 311, Durham; Contact: Personnel Office; Report: 7/8/68.

- (2) Investment: State substance, research and state, various in technical fields; Amount: \$2 million; Type of equipment: Research and development; Nature of research and development.

- (3) The manufacture of very small diameter (1 mil) thin power metal alloys, improved production processes, special problems. GOVERNMENT can use scientific revolution, work in this direction. It can develop other power metallurgical processes, technological progress of joining, etc., on the basis of which they will be able to fabricate components without the use of special equipment.

- (4) Radio, telecommunication, telecommunication, etc.

- (5) Invention of power metal alloys and their application in various fields.

Reference No.

77

JANUARY

POWDER METALLURGY

- (1) AMERICAN METAL WORKS CORP., Research and Development, United States of America; Address: 111-1000; Contact: Director, Metal Powder Laboratory (M.P.L.); Contact: Mr. H. A. Brown (President)

- (2) Invention: Large quantities of well-sorted particles; Nature of technology: Metallurgical processes.

- (3) The technology of powder metallurgy is available in the following areas:

- 1. Development of required equipment and processing equipment and foreign sources.
- 2. Training of license personnel of Remko, N.V., under Denmark, Weert, The Netherlands.
- 3. Metallurgical consulting services.
- 4. Exchange of new developments in various areas, methods of manufacture, equipment, carbide use etc.

- (4) Tungsten and titanium carbide products are used for cutting tools, mining tools and wearing parts. Also other specialized applications where high strength and resistance to wear are required.

- (5) The knowhow is available in various forms of licensing agreements.

Reference No.

7/8

UNITED STATES OF AMERICA

HIGH PURITY POWDER PRODUCTION

- (1) METALWORKS INC., P.O. Box 100, Millersville, Pa. 17041, United States of America; Address: Millersville; Contact: Mr. William W. Brown, President

- (2) Investment: Plant: \$1,000,000; Equipment: \$250,000; Other: \$1,000,000; Type of equipment: Metallurgical processes.

- (3) Will design, build and operate high purity powder production units for the production of powder from molten metal high purity and etc. Units can be external and/or internal melted or are melted metal or unit can have integrated high purity and etc. powder systems. Powder formed is collected in a high purity gas. Particularly useful for high temperature alloys.

- (4) Will sell equipment and/or design of equipment. Will sell technology and provide expert assistance in starting and operating equipment.

Reference No.

7/9

UNITED STATES OF AMERICA

GROUP 8 - SHEET METAL FORMING

Reference No.

8/1

FRANCE

(1) MANUFACTURE OF BUCKLED HOOPERS AND WELDED TUBES IN FERROUS ALLOYS

(a) GOSBUR-LECHIMY, 11, Avenue Marceau, Paris 16, France; Tel.: 01 53 61 11 11; Telex: 210 000; Elex: 210 00 00; Contact: A. Grevet (SNA, Technical Assistance Department).

(b) France; Main French metal forming processes; Specialized processes; Sales: 10,000 million; No. of employees: 1,000; Main nature of business: Primary transformation of aluminium: rolling, drawing and extrusion of all wrought aluminium alloys.

(c) The technology available concerns:

- Manufacture from cold-rolled strip of products (hoops, structural sheets, trapezoids).
- Manufacture from strip of welded sections.
- Manufacture from strip of welded tubes.

The knowhow covers principally the following:

- Definition of suitable strip qualities (alloys, metallurgical treatment, etc.).
- Design of press tools.
- Manufacturing techniques.
- Operation of plant.
- Quality control.

The experience of Gosbur-Lechimy is derived not only from its major French plants, but also from smaller operations in foreign subsidiaries, and means that the company is equipped to provide the best solution for each local situation.

(d) Press sheets are used principally in the constructional industry, for roofs, ceilings, etc.

Welded tubes are used for metal furniture (smaller diameters) and in irrigation (larger diameters).

(e) Gosbur-Lechimy can offer the following assistance and knowhow, in part or complete:

- Basic technological documentation.
- Assistance in setting up realistic manufacturing programmes.
- Selection of basic equipment.
- Specification of equipment and issuing invitations to tender.
- Preliminary evaluation of tenders.
- Assistance in selection of supplier.
- Planning and layout of plants.
- Advice on ancillary equipment.
- Supervision of installation of equipment.
- In-plant training.
- Commissioning.
- Operational planning.
- Advice on expansion of existing plant.
- Knowhow on new products.

Reference No.

8/2

HUNGARY

(1) METHOD FOR DETERMINING DEEP-DRAWING QUALITIES OF SHEET METAL

(a) HUNGARIAN INSTITUTE FOR FERROUS METALLURGY, P. H. R. 11, Budapest 12, Hungary; Elex: 210-0000; Contact: Dr. John Foth (Vice-Director).

(b) Governmental; No. of employees: 200; Main nature of business: Research and development in ferrous metallurgy.

(c) A technique and apparatus have been evolved for evaluating the deep-drawing and stretch-forming properties of sheet metal. This is based on measurement of the formability parameters: plastic anisotropy (r) and strain-hardening (n).

The apparatus determines r and n values simultaneously and accurately from tensile tests.

(d) Sheet metal industries (pressing, stamping, etc.), such as automotive, sensible apparatus, etc., and basic steel producing industry (for determination of optimum parameters).

(e) Knowhow and equipment available, subject to negotiation. The equipment can also be studied in Hungary.

Reference No.
8/3
 FEDERAL BUREAU OF INVESTIGATION

(1) **WARRICK ROVERS LTD.**, 100, Victoria Road, Warrick, Warwickshire, CV35 9EF, England; Telephone: 0527 51111; Telex: 250000; Main nature of business: Production of wire mesh for agricultural purposes.

(2) **WARRICK ROVERS LTD.**, 100, Victoria Road, Warrick, Warwickshire, CV35 9EF, England; Telephone: 0527 51111; Telex: 250000; Main nature of business: Production of wire mesh for agricultural purposes.

- (a) **Marketing methods:**
- Sales:** Direct sales, through agents, and through the company's own sales force.
 - Wholesaling and marketing:** Wholesaling, through agents, and through the company's own sales force.
 - Exporting:** Exporting to various countries, including the United States, Canada, and Australia.
 - Advertising:** Advertising in trade journals, newspapers, and magazines.
- (b) **Production:**
- The production process involves the drawing of wire, the weaving of the wire into mesh, and the finishing of the mesh.
 - The company's production facilities are located at Warrick, Warwickshire, England.
 - Advertising expenditure is used to promote the company's products and services.

Reference No.
8/4
 FEDERAL BUREAU OF INVESTIGATION

(1) **COLD ROLL FORMING OF STEEL SHEET**

(2) **N. WILKINSON**, Mill, Frodingham, Scunthorpe, Yorkshire, England; Telephone: 01753 51111; Telex: 250000; Main nature of business: Production of cold rolled steel sheet.

(3) **Governmental:** Chartered: D. Wilkinsons; Limited: N. Wilkinsons; Main nature of business: Production of cold rolled steel sheet.

- (a) Cold roll forming is the most economical method for the mass production of sheet metal products. It is a continuous process, and the material is fed in and out of the machine.
- (b) Cold roll forming is a well-developed technique, and it is used in a wide range of applications. It is a simple process, and it can be operated by unskilled labor.
- (c) Automation is increasingly necessary to produce sheet metal products in large quantities. Automation is used in a wide range of applications, including the production of sheet metal products.
- (d) Attention: rollers, conveyor equipment, constructional machinery, electrical machinery, and other components, tanks, paneling, painting, etc.
- (e)
- Joint venture policy for development of cold rolled steel products in local markets.
 - Breeding for products and plants.
 - Training of recipient's personnel.
 - Design and delivery of equipment.
 - Expert technical assistance.
 - Financial arrangements.

Reference No.
8/5
 UNITED KINGDOM

(1) **ATHEMPLASIC CEMENT ROYALTY - TRADE MARK IN U.K.**

(2) **ISC ALLOYS LTD.**, Alloys House, 10, St. Andrew's Place, London, E.C.4, England; Telephone: 01-252 1234; Telex: 250000; Main nature of business: Production of alloys.

(3) **Private:** Issued Capital: £10,000; Annual Profit: £1,000; Main nature of business: Production of alloys.

GROUP 9 - MISCELLANEOUS METHODS OF FORMING

(1) EXPLOSIVE FORMING

9/1
MISCELLANEOUS

- (2) DENVER RESEARCH INSTITUTE, University of Denver, Denver, Colorado, U.S.A.; Phone: (303) 744-0111/744-0111; Contact: Dr. Arthur J. ... Dept. of Mechanical, Electrical and Environmental Engineering.
- (3) Private; University-based non-profit research association; \$1,000,000; Main nature of treatment: Research and development contracts; Main nature of treatment: Research and development.
- (4) Explosive forming uses the energy of high explosive in a controlled manner to shape metal parts. The female die, if needed, the explosive shock wave acting on a metal die. The initial velocity of the die is very low, since only a pool of water of sufficient depth, a cushion of helium, or a layer of sand in the working area, and the usual hand tools are necessary. It is possible for castings to be formed that would make it possible to locate the facilities within 100 miles of other occupied territories.
- (5) Explosive forming of cones for storage or pressure vessels shows the greatest potential for expansion.
- (6) The Denver Research Institute will design the facility, train the personnel to erect it, and conduct a continuing market survey, preparing an economic analysis, and a business plan. Institute personnel will provide expert assistance in defining the facility, interpretation and will be available for subsequent consultation and guidance. These services are offered by the institute at cost plus a management fee of 10% per year, plus a minimum two years after the facility goes into production. The responsibility for construction and all other insurance costs, however, is paid in US dollars.

(1) SUPERPLASTICITY IN MASS-PRODUCTION METAL FORMING

9/2
MISCELLANEOUS

- (2) PALMER RESEARCH INSTITUTE LTD., Stoke Poges, Slough, Bucks MK44 3JH, United Kingdom; Cable: Research Slough; Telex: 3344 Palmer; Phone: Palmer 211; Contact: J.A. Naylor (Information and Development Manager).
- (3) Private; Independent research institute specializing in materials technology; No. of employees: 150; Main nature of treatment: Research and development.
- (4) Certain metals and alloys, when heated to comparatively low temperatures, undergo a dramatic change in their so-called "superplasticity". This superplastic behavior allows the metal to be formed into complex shapes in a single operation, even at very low speeds. This behavior is the result of a complex interaction of research for design and better ways of making components, such as "forming and joining" technology. Engineering components made by superplastic forming are already in use in a number of cases, but the potential of superplasticity is not yet fully appreciated. Palmer, with a commercial development program, is the factory retaining mechanical properties and structure, as the metal is currently produced, with a market research firm, a group-dependent project to study the opportunities and threats presented to the engineering industry by superplastic metals.
- (5) Palmer is prepared to grant licenses and transfer technology proposals. Confidential reports are obtained and provided on a contract basis.

(1) DRAWING OF BEARLESS STEEL CYLINDERS

9/3
MISCELLANEOUS

- (2) CSMTEL IRON AND METALWORKS, Csepe 1, P.O. box 91, Budapest XXI, Hungary; Telex: 20-5883; Phone: 311-005; Contact: International Commercial Relations Department.
- (3) Governmental; Major engineering complex; Main nature of treatment: Planning and engineering projects.
- (4) The process covered in the knowhow available begins with a machining of a blank. A hole is formed at the end of the billet, and a thin-walled cylinder is then drawn on a horizontal drawbench. The throat is formed by heating the open end and then drawing it together along a spiral of steel. The final shape of the throat is formed with a manual hand press.
- (5) Sodium and large-pressure cylinders (10-50 liter capacity).
- (6) A lump-sum payment plus an agreed royalty per cylinder manufactured. Support and training of personnel is possible, under a separate agreement.

Reference No.

9/4

HUNGARY

- (1) NIECHOGA DIECAST FORMING OF THIN PLATES AND JOINTS FOR DIECAST FORMING
- (2) GEFTECHINE (Machine Industry Technological Institute), Puskas ut 11, Budapest XIV, Hungary; Telex: Chemmag 3222; Phone: 413-122.
- (3) Governmental; State Industrial Research Institute, working on contract basis; Budget: Ft. 50 million; No. of employees: 100; Main nature of business: Machine-tool and machinery research and development.

(4) Electromagnetic forming is used for reducing or expanding hollow casting materials in order to form a surface pattern or to make joints with other components.

Knowhow is available on the formation of thin plates, forming of pipe ends, joining of flexible pipe ends, etc. in aluminum and copper; the knowhow covers process and equipment.

(5) Process knowhow and/or plant supplied against lump-sum payment.

Reference No.

9/5

HUNGARY

- (1) EXPLOSIVE FORMING-PROCESS, EQUIPMENT, PLANTS
- (2) GEFTECHINE (Machine Industry Technological Institute), Puskas ut 11, Budapest XIV, Hungary; Telex: Chemmag 3222; Phone: 413-122.
- (3) Governmental; State Industrial Research Institute, working on contract basis; Budget: Ft. 6 million; No. of employees: 100; Main nature of business: Equipment and machinery research and development.

(4) In explosive forming, the energy resulting from the controlled detonation of an explosive material is used to deform plate materials in prepared formers. It can be used with corrosion-resistant materials that are difficult to form conventionally. It has advantages over conventional press forming in that expensive presses are not needed, but merely a die in normal deep-drawing tool material. High-strength materials can be subjected to cold forming, avoiding such subsequent heat treatment, and a greater degree of deformation can be achieved in a single operation.

(5) Pressure vessel manufacture.

(6) Process knowhow and/or plant supplied against lump-sum payment.

Reference No.

9/6

UNITED KINGDOM

- (1) COIL SWAGING
- (2) ROYAL SMALL ARMS FACTORY, Enfield Lock, Enfield, Middlesex EN3 6JL, United Kingdom; Telex: 3229; Phone: Watton Green 344; Contact: Mr. Director (attn. E.D. Finney, Chief Metallurgist).
- (3) Governmental; Main nature of business: Manufacture of armaments.

(4) Knowhow on rotary coil swaging of rifled and plain carbide tubes in steel.

(5) Engineering components, ordnance, etc.

(6) Knowhow etc.

Reference No.

9/7

JAPAN

- (1) CORRUGATED PIPE AND LINER-PLATE
- (2) KAWASAKI STEEL CORPORATION, New Yarakuchō Bldg., 11, Yarakuchō 1-chome, Chiyoda-ku, Tokyo, Japan; Calls: Riverstecorp Tokyo; Telex: 0201-065 "RIVERSTECORP TOK"; Phone: Tokyo 31-4511; Contact: Mr. Minoru Ikeda (General Manager).
- (3) Private; Capital: ¥2,000,000,000; Net sales: ¥2,000,000,000; No. of employees: 35,000; Main nature of business: Iron and steel manufacturer.

(4) Technology relating to all aspects of the forming of corrugated pipe and liner plates are offered.

(5) We are ready to negotiate for detailed conditions as mentioned above depending upon specific interest of inquirers, taking into consideration type, scale and characteristics of their proposals.

(1) PREFABRICATED FRAMES

(2) KAWASAKI STEEL CORPORATION, New Yamanashi Bldg., 11, Yamanashi B-chome, Chiyoda-ku, Tokyo, Japan; Cable: Riversteeor; Tokyo; Telex: 0 2 2 2 "KAWASAKI STEEL"; Phone: Tokyo 31-4511; Contact: Mr. Minoura Ikuo (General Manager).

(3) Private; Capital: \$ 3,000,000; Net worth: \$ 1,000,000; No. of employees: 30,000; Main nature of business: Iron and steel manufacturing.

(4) Technology relating to the various fabricating techniques which have been developed for construction of steel frames are offered.

(5) We are ready to negotiate for detailed conditions as mentioned above depending upon the interest of inquirers, taking into consideration type, scale and characteristics of their projects.

9/8
1977

(1) STEEL BEARING AND SLABING SYSTEMS FOR HEAVY-DUTY LATERALS

(2) KAWASAKI STEEL CORPORATION, New Yamanashi Bldg., 11, Yamanashi B-chome, Chiyoda-ku, Tokyo, Japan; Cable: Riversteeor; Tokyo; Telex: 0 2 2 2 "KAWASAKI STEEL"; Phone: Tokyo 31-4511; Contact: Mr. Minoura Ikuo (General Manager).

(3) Private; Capital: \$ 3,000,000; Net worth: \$ 1,000,000; No. of employees: 30,000; Main nature of business: Iron and steel manufacturing.

(4) Kawasaki Steel has a new technical system for bearing and slabing of laterals. Knowhow relating to this new process is offered.

(5) We are ready to negotiate for detailed conditions as mentioned above depending upon the interest of inquirers, taking into consideration type, scale and characteristics of their projects.

9/9
1977

(1) PRODUCTION TECHNOLOGY OF GAS CYLINDERS FROM BEANFIELD STEEL PLANT

(2) SUMITOMO METAL INDUSTRIES, LTD., 1-1, Kitahama 5-chome, Higashi-Shinjuku-ku, Tokyo; Cable: SUMITOMOMETAL OSAYAMA; Telex: 3 2 2 2; Phone: 03-33511111.

(3) Private; Capital: ¥ 1,000,000,000; Net worth: ¥ 300,000,000; No. of employees: 10,000 (as of March 1977); No. of employees: 10,000 (as of March 1977); Main nature of business: Production and sales of carbon steel rolled products, alloy steel rolled products, forging, casting, rolling stock parts and fabricated goods.

- (4)
1. Bottom forming equipment and production process from hot metal to gas cylinders.
 2. Top forming equipment and production process from hot metal to gas cylinders and forgings.
 3. Hydraulic stretch testing equipment, including water and oil systems.
 4. Automatic die stamping device.
 5. Automatic paint coating equipment.

- (5)
1. Engineering service at the construction of equipment (including design and construction).
 2. Technical assistance of operation and quality control.
 3. Training at our plant in Japan.

9/10
1977

GROUP 10 - COATING AND PROTECTION

Reference No.

10/1

FRANCE

(1) VARNISH AND PAINTS APPLIED FOR LIGHT-ALLOY PLATES AND SHEETS

CHIEF-DIRECTOR, 25 Avenue Marconi, Paris 16, France; (Address: Director's Office)
Telex: 21 000; Phone: 20 01 10 00; Contact: A. Grandjean, Technical Administration Department

Private: Major French non-ferrous metal producers; Capital: F 1,000 million; Sales: F 1,000 million; No. of employees: 1,000; Main activity: Primary transformation of aluminium: rolling, drawing and extrusion of all wrought aluminium alloys.

(2) The technology available concerns:

- Manufacture of varnished sheets or strips
- Manufacture of painted sheets or strips

The know-how covers all or part of the following:

- Definition of suitable grades of sheets and strips (alloy, metal-chemical treatment, surface quality, etc.)
- Manufacturing techniques: conversion, coating and curing
- Exploitation of materials
- Quality control
- Study and control of paint and varnish coatings in the context of their applications.

The experience of Corus-Bochard is derived not only from its major French plants, but also from smaller operations in foreign subsidiaries, and means that the company is equipped to provide the best solution for each local situation.

(3) Varnished products have applications in the food preserving industries, in the manufacture of aerosols, bottles, etc.

The painted products may be used in building frames, secondary roofs, etc., in the construction of machines, the containers, and for special equipment.

(4) Corus-Bochard can offer the following assistance and know-how, in part or completed:

- Basic technical group documentation
- Assistance in setting up realistic manufacturing programmes
- Selection of basic equipment
- Specification of equipment and material installation for tender
- Preliminary evaluation of tenders
- Assistance in selection of supplies
- Planning and layout of plants
- Advice on ancillary equipment
- Supervision of installation of equipment
- In-plant training
- Commissioning
- Operational planning
- Advice on expansion of existing plant
- Know-how on new products

Reference No.

10/2

FRANCE

(1) ANODIZING OF LIGHT ALLOYS

CHIEF-DIRECTOR, 25 Avenue Marconi, Paris 16, France; (Address: Director's Office)
Telex: 21 000; Phone: 20 01 10 00; Contact: A. Grandjean, Technical Administration Department

Private: Major French non-ferrous metal producers; Capital: F 1,000 million; Sales: F 1,000 million; No. of employees: 1,000; Main activity: Primary transformation of aluminium: rolling, drawing and extrusion of all wrought aluminium alloys.

(2) The technology available relates to:

- Traditional anodizing (coloured or plain) of light-alloy products, principally of extruded sections and sheets
- Colouring of anodized films by electrolytic methods
- Self-colouring anodizing of the above products

The know-how covers principally:

- Properties needed in products for anodizing
- Anodizing technology
- Exploitation of materials
- Quality control

The experience of Corus-Bochard is derived not only from its major French plants, but also from smaller operations in foreign subsidiaries, and means that the company is equipped to provide the best solution for each local situation.

(c) Analyzing projects are used in construction of metal structures, such as offshore platforms, windows, domestic electrical apparatus, etc.

(d) Regular-Partners can offer the following assistance and services to recipient countries:

- Basic technical documentation
- Assistance in setting up realistic specific training programs
- Selection of basic equipment
- Specifications of equipment and training adaptations to local conditions
- Preliminary evaluation of tenders
- Assistance in selection of suppliers
- Planning and layout of plants
- Advice on ancillary equipment
- Supervision of installation of equipment
- In-plant training
- Commissioning
- Operational planning
- Advice on expansion of existing plant
- Knowledge of new products

Reference No.

10/3

FINLAND

(1) CORROSION PREVENTION

(2) KORMET Oy, P.O. Box 31, S-00030 Espoo, Finland; Tel: 045-200100; Phone: 00-10000

(3) Private; A small group of experts in corrosion, electroplating, metal treatment, and metallurgy; Main nature of business: Consulting engineers.

(4) General and operational consulting services in problems connected with corrosion in process and plant industries

Consulting on specific corrosion problems

Supervision of corrosion prevention jobs

Laboratory and on-site corrosion research

Planning of corrosion research laboratories, including training of personnel and planning and initiation of research programmes.

(5) Expert assistance available

Training of recipient's personnel

Financial arrangements to be agreed in industrial cases.

Reference No.

10/4

UNITED KINGDOM

(1) HIGH-SPEED ELECTRODEPOSITION

(2) PALMER RESEARCH ENTERPRISE LTD., Stone House, Gloucs, Glos, N. 12, United Kingdom; Cable: Research Gloucs; Telex: 2111 Palmer; Teleg: Palmer Ltd; Contact: Mr. N.A. Bailey (Information and Development Manager).

(3) Private; Independent research institute specializing in materials technology; 100 employees; 140; Main nature of business: Research and development.

(4) The development of methods for achieving high-rate electrodeposition, especially for copper and nickel, at current densities up to 2,000 amp/sq ft has been completed.

Copper and nickel can be electro-deposited at rates of 0.001 - 0.002 g/amp-hr from simple solutions without significant deterioration in mechanical properties. The techniques employed do not require extensive filtration and purification of the bath and brightening or leveling agents are not necessary. This method of high-rate deposition can probably be applied to metals other than copper or nickel.

Schemes both for continuous forming of strip or sheet and for batch-wise forming of components are being outlined.

(5) Palmer is prepared to grant licences and train recipient's personnel. Certain expert assistance can be provided on a contract basis.

VEVAL - 1974-1975 - 1/1-1/28-1/28-1/28-1/28

PLUMBER RESEARCH INSTITUTE S.p.A., Via S. Maria, 10, 20122, Milano, Italy; Capital: Lit. 1,000,000,000; No. of employees: 100; Main nature of business: Research and Development; Contact: Mr. J.A. Gaglio, Chief Engineer and Development Manager.

Private; Independent research institute specializing in materials technology; No. of employees: 100; Main nature of business: Research and Development.

- (1) A process for the production of a continuous film of metallic material by electrolysis. The process is based on the electrolysis of a solution of a metal salt in an electrolyte. The electrolyte is a solution of a metal salt in an electrolyte. The process is based on the electrolysis of a solution of a metal salt in an electrolyte. The electrolyte is a solution of a metal salt in an electrolyte.
- (2) Process can be used for the production of a continuous film of metallic material by electrolysis. The process is based on the electrolysis of a solution of a metal salt in an electrolyte. The electrolyte is a solution of a metal salt in an electrolyte.
- Process can be used for the production of a continuous film of metallic material by electrolysis. The process is based on the electrolysis of a solution of a metal salt in an electrolyte. The electrolyte is a solution of a metal salt in an electrolyte.
- Process can be used for the production of a continuous film of metallic material by electrolysis. The process is based on the electrolysis of a solution of a metal salt in an electrolyte. The electrolyte is a solution of a metal salt in an electrolyte.
- (3) Patent is granted to prevent unauthorized reproduction, distribution, or export of this process. The patent is granted to prevent unauthorized reproduction, distribution, or export of this process.

Reference No.

10/5

UNITED KINGDOM

(1) PUBLISHED FOR PROMOTING EARLY INVESTMENT-RELATED FINANCING IN VEVAL

PLUMBER RESEARCH INSTITUTE S.p.A., Via S. Maria, 10, 20122, Milano, Italy; Capital: Lit. 1,000,000,000; No. of employees: 100; Main nature of business: Research and Development; Contact: Mr. J.A. Gaglio, Chief Engineer and Development Manager.

Private; Independent research institute specializing in materials technology; No. of employees: 100; Main nature of business: Research and Development.

- (2) Metal polymer that will be used in the production of a continuous film of metallic material by electrolysis. The process is based on the electrolysis of a solution of a metal salt in an electrolyte. The electrolyte is a solution of a metal salt in an electrolyte.
- (3) Patent is granted to prevent unauthorized reproduction, distribution, or export of this process. The patent is granted to prevent unauthorized reproduction, distribution, or export of this process.

Reference No.

10/6

UNITED KINGDOM

(1) AIR KNIFE SYSTEM FOR CONTINUOUS GALVANIZING

ITALIDER S.p.A., Via S. Maria, 10, 20122, Milano, Italy; Capital: Lit. 1,000,000,000; No. of employees: 100; Main nature of business: Research and Development; Contact: Mr. J.A. Gaglio, Chief Engineer and Development Manager.

Mixed; Major Italian iron and steel producer; Capital: Lit. 1,000,000,000; No. of employees: 44,000; Main nature of business: Production of iron and steel.

- (2) The air knife system is an alternative to the conventional galvanizing plant, which uses two powered coating rolls immersed in the bath of molten zinc, to adjust the thickness of the coating applied to the strip. The air knife system is based on the potential energy of a low-pressure liquid, which is converted to kinetic energy when the fluid is forced through a narrow slot.
- Adjustment of the coating as the strip enters from the zinc bath is determined by the following parameters:
1. Fluid pressure
 2. Position of the air knife - distance above bath, distance from strip, angle of inclination to strip.
 3. Knife geometry (i.e. gap profile)
 4. Knife thickness
- This system offers excellent economic advantages over the conventional roll system, because of its low manufacturing cost, its negligible maintenance cost, its ease of operation, its freedom in coating weight adjustment, and the fact that there is no mechanical contact with the strip.

Integrated assistance program, implemented by Italider S.p.A. in recipient's work and training of recipient's personnel in Italider area.

The various possible conditions for transferring the know-how will be discussed in consultation from potential recipients.

Reference No.

10/7

ITALY

3. Know-how in the form of design drawings, all sorts of plans, and technical procedures for making sheet and strip in water with zinc, copper, and tin. Following receipt of:
- Detailed, complete and accurate technical drawings.
 - Detailed drawings.
 - Detailed technical data.
 - Detailed plans, drawings, and technical documents.
4. Know-how in the form of design drawings, all sorts of plans, and technical procedures for making sheet and strip in water with zinc, copper, and tin. Following receipt of:
5. Technical arrangements against payment of fees and systems necessary connected with transfer of technology that should include, but not be limited to, with recipients: Training of Swedish personnel who will be in charge of plant operation. Plant operation data for factory transfer and start-up of plant.

Reference No.

5/6

UNITED KINGDOM

(1) MANUFACTURE OF HIGH-ALLOY STEEL BARS

(1) SWEDEN SKANSKA AB, Skanska Steel Works, Ltd., Box No. 1, Skövde, S-211P, Sweden; Address: Skanska Steel Works, Ltd., Box No. 1, Skövde, S-211P; Phone: 0433; Telex: (031) 000; Contact: Mr. S. W. Foster, Group Project Manager.

(2) Private; Share capital: 100,000,000 Swedish Kronor; Capital: £1 million; Plant: £1 million; No. of employees: 1,000; Main nature of industry: Manufacture of high-alloy steel bars, extruded steel sections, coils, sheets, castings, tools, etc.

(3) Know-how in the form of design drawings, all sorts of plans, and technical procedures for the manufacture of high-alloy multiple-point, steel bars from ingot material, including building construction and process requirements, based on a nominal output capacity of 6,000 tons per annum of product and a value of an average of \$100 million, of steel, of steel, \$11 million and capital expenditure in the order of £10 million.

Finished to within the range of 1/16" to 1/8" section in round, hexagon, square, oval, square, flats, etc. with all of 1/16" to 1/8" diam.

Manufacturing techniques including billet casting and casting, billet heating, forming including electrical controlled rolling, hot rolling, hot heat treatment, forming, hot finishing procedures including straightening, rolling, turning, surface treatment, crack detection, and all related materials handling and weighing equipments.

Know-how in the form of design drawings, all sorts of plans, and technical procedures for a green field start to a fully operational unit including drawings, layouts, programs, planning, cost, and process control techniques. Technical and operational advice and information is available in respect of product and manufacturing, project management, quality control, quality standards and control, production planning and control, and all related management requirements and associated administration and staffing.

The plant of the recipient will be a green field start with a limited, however, to ensure vital sources of quality and workability past several in production of high-alloy steel and valve steel, and it is intended to install rolling facilities to produce coils as an integral part of the project. The rolling facilities require additional capital expenditure to that provided, specified.

(4) Implementation agreements

Stage 1. Preliminary exchange of views between Givern and recipient to establish mutual interest.

1. Preliminary survey work to set which specific parameters of requirements.
2. Preparation and submission of written survey report and proposals.
3. Negotiation and finalization of a proposal, financial, commercial and contractual terms.
4. Invitation for recipient to visit Givern to see and discuss the present technology and procedures.
5. Givern to supply reports, documentation, manual instructions, photographs.
6. Givern to provide on-site training for recipient's staff.
7. Givern to train recipient personnel in such techniques, procedures and practices.
8. Givern to service project operation on contractual terms.

Commercial policy

Stage 1 will involve no expense to the recipient.

Stages 2, 3, 4, 5, 6, 7, 8 will be carried out on an individual fee plan, as mentioned in accordance with requirements.

Stages 9, 10, 11, 12 will be carried out on an individual fee plan, as mentioned in accordance with requirements. The recipient's contribution will be a percentage of the total cost of the project under joint-venture arrangements.

Reference No.

5/7

SWEDEN

(1) ROD MILLING OF STEEL

(1) SWEDEN SKANSKA AB, Skanska Steel Works, Ltd., Box No. 1, Skövde, S-211P, Sweden; Address: Skanska Steel Works, Ltd., Box No. 1, Skövde, S-211P; Phone: 0433; Telex: (031) 000; Contact: Mr. S. W. Foster, Group Project Manager.

(2) Private; Share capital: 100,000,000 Swedish Kronor; Capital: £1 million; Plant: £1 million; No. of employees: 1,000; Main nature of industry: Manufacture of high-alloy steel bars, extruded steel sections, coils, sheets, castings, tools, etc.

1. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

- 2. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

3. The recipient shall be the manufacturer of the product AMALGAM in the United States.

4. The recipient shall be the manufacturer of the product AMALGAM in the United States.

5. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

Reference No.
10/11
DATE

6. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

7. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

8. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

- 9. Conventional and low-temperature applications of aluminum and the alloys, comprising the following operations:
 - Surface cleaning and brushing
 - Anodizing
 - Washing and drying

10. Civil and electrical low voltage components and decorative pieces.

11. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

Reference No.
10/12
UNITED STATES OF AMERICA

12. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

13. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

14. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

- 15. Complete range of knowhow, technical, and other services in the field of aluminum casting technology, comprising:
 - a. appraisal of administrative manufacturing programs and procedures
 - b. appraisal of obsolete raw materials and replacement of obsolete equipment and machinery, and product requirements, raw materials, etc.
 - c. appraisal of site considerations
 - d. development of equipment specifications and production flow
 - e. advice on selection of contractors
 - f. development of equipment layout detail
 - g. supervision of construction, equipment, and commissioning
 - h. training of all grades of personnel
 - i. provision of sample material and development of tooling
 - j. assist domestic manufacturers in development of systems
 - k. establishment of developed and control instructions, equipment, and repairs
 - l. testing of domestic raw materials in client's and OEM laboratories and on OEM production lines
 - m. supply of raw materials as reference standards
 - n. development of markets
 - o. transfer on client's equipment after set-up

16. Construction, directly applicable knowhow, automated, etc.

17. Knowhow transmitted under sale of knowhow contracts. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances. AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

Alternatively, AMALGAM shall be the name of the product to be manufactured by the recipient of the technology transferred in certain circumstances.

Reference No.

10/13

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- (1) 10/13/13
- (2) 10/13/13
- (3) 10/13/13

Reference No.

10/14

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- (1) 10/14/14
- (2) 10/14/14
- (3) 10/14/14

Reference No.

10/15

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10/15/15

- (1) 10/15/15
- (2) 10/15/15
- (3) 10/15/15

Reference No.

10/16

DATE

MEMORANDUM FOR THE DIRECTOR, FBI

FROM: SAC, NEW YORK (100-100000)

SUBJECT: [Illegible]

[Illegible text follows]

Reference No.

10/17

DATE

MEMORANDUM FOR THE DIRECTOR, FBI

FROM: SAC, NEW YORK (100-100000)

SUBJECT: [Illegible]

[Illegible text follows]

Reference No.

10/18

DATE

MEMORANDUM FOR THE DIRECTOR, FBI

FROM: SAC, NEW YORK (100-100000)

SUBJECT: [Illegible]

[Illegible text follows]

Reference No.

10/19

DATE

MEMORANDUM FOR THE DIRECTOR, FBI

FROM: SAC, NEW YORK (100-100000)

SUBJECT: [Illegible]

[Illegible text follows]

Reference No.

10/20

AI 41

(1) HIGH-SPEED STEEL

(A) SHIMIZU KOKUSAI KOGYO CO., LTD., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan; Tel: 3-35-1111; Telex: 320000 SHIMIZU; Cable: SHIMIZU; Agents: Nippon Kogyo Kaisha, Ltd., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan.

(B) Invention: Method of producing high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel.

(1) The invention relates to a method of producing high-speed steel, which is characterized in that the steel is produced in a vacuum furnace.

(2) The invention relates to a method of producing high-speed steel, which is characterized in that the steel is produced in a vacuum furnace.

Reference No.

10/21

AI 41

(1) HIGH-SPEED STEEL

(A) SHIMIZU KOGYO KOGYO CO., LTD., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan; Tel: 3-35-1111; Telex: 320000 SHIMIZU; Cable: SHIMIZU; Agents: Nippon Kogyo Kaisha, Ltd., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan.

(B) Invention: Method of producing high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel.

(1) The invention relates to a method of producing high-speed steel, which is characterized in that the steel is produced in a vacuum furnace.

1. Prevention of surface scale formation.
2. Prevention of surface oxidation.
3. Improvement of surface finish.
4. Retention of surface properties.
5. Retention of grain structure.
6. Improvement of weldability.

The invention relates to a method of producing high-speed steel, which is characterized in that the steel is produced in a vacuum furnace.

Reference No.

10/22

AI 41

(1) HIGH-SPEED STEEL

(A) SHIMIZU KOGYO KOGYO CO., LTD., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan; Tel: 3-35-1111; Telex: 320000 SHIMIZU; Cable: SHIMIZU; Agents: Nippon Kogyo Kaisha, Ltd., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan.

(B) Invention: Method of producing high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel.

(1) Ordinarily, preventive treatment is performed on a metal surface in order to prevent oxidation. However, the method has been proposed to prevent oxidation by the use of a special surface treatment. The method involves the use of a special surface treatment. The method involves the use of a special surface treatment.

The new development can prevent the white rust for a long time, by which the surface weight is reduced. Generally speaking, anti-corrosivity is better when the surface coating weight is reduced. In this method, even the steel with low chrome coating weight will have the similar anti-corrosivity to that of steel with usual high chrome coating weight.

Attractive surfaces with low coloring can be obtained by this method.

Reference No.

10/23

AI 41

(1) HIGH-SPEED STEEL

(A) SHIMIZU KOGYO KOGYO CO., LTD., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan; Tel: 3-35-1111; Telex: 320000 SHIMIZU; Cable: SHIMIZU; Agents: Nippon Kogyo Kaisha, Ltd., 1-1-1, Higashi-Shinjuku, Shinjuku-Ku, Tokyo, Japan.

(B) Invention: Method of producing high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel. The method involves the use of a vacuum furnace for the production of high-speed steel.

Process of... manufacture... followed by certain... two-stage bake...

Reference No.

10/24

JAPAN

NO. 1001, DENKI DENKI... WITH... 10/24/55

1. DENKI DENKI... 10/24/55

Private;... Manufacture of these... containing...

From... (nickel, cobalt, iron, copper, zinc, silver, gold, platinum)...

In... with... wearing, erosion, heat protection, etc.

Improvement of... properties.

These... of... etc.

The use of... heating...

As... (printing-plant, textile industry, etc.)...

For... in our plants in Japan.

Our... participation...

Information...

Classification:...

Priority claims:...

Legal disclaimer:...

Reference No.

10/25

JAPAN

PRODUCTION... 10/25

DENKI DENKI... 10/25/55

Private;... 10/25/55

1. Production...

- 1. The... 2. The... 3. The...

Reference No.

10/26

APAN

- (1) INFORMATION RELATIONSHIP OF THE UNITED STATES JAPAN
- (2) NIPPON KOGAKU KENKUSHO CO., LTD., 1-1, Katsushika-cho, Bunkyo-ku, Tokyo, Japan; Office: NIPPON KOGAKU KENKUSHO CO., LTD.; Telephone: 3-10-11.
- (3) Private; Contact: Y. K. Kimura, Director; Address: 1-1, Katsushika-cho, Bunkyo-ku, Tokyo, Japan; No. of employees: 10; No. of patents: 1; Main nature of business: Iron, steel and metal processing; Products: Iron, steel and metal products, foreign, machine, rolling of the parts and castings.
- (4) Iron-steel technology of steel for steel sheets, subject to pretreatment, in order to improve appearance of full range of rolled steel materials, and to improve mechanical properties by chromate treatment and etc.
- (5) Know-how
1. Engineering services at the construction of the plant.
 2. Technical assistance of operation and piping system.
 3. Training at the plant in Japan.

Reference No.

10/27

APAN

- (1) INFORMATION RELATIONSHIP OF JAPANESE JAPAN
- (2) NIPPON KOGAKU KENKUSHO CO., LTD., 1-1, Katsushika-cho, Bunkyo-ku, Tokyo, Japan; Office: NIPPON KOGAKU KENKUSHO CO., LTD.; Telephone: 3-10-11.
- (3) Private; Contact: Y. K. Kimura, Director; Address: 1-1, Katsushika-cho, Bunkyo-ku, Tokyo, Japan; No. of employees: 10; No. of patents: 1; Main nature of business: Iron, steel and metal processing; Products: Iron, steel and metal products, foreign, machine, rolling of the parts and castings.
- (4) 1. Fresh-then technology of steel for steel sheets, steel, in order to improve appearance of pretreatment of iron and steel sheets, machine, rolling.
2. Protective technology of mechanical steel materials for steel sheets, machine, rolling.
- (5) 1. Engineering services at the construction of the plant in Japan.
2. Technical assistance of operation and piping system.
 3. Training at the plant in Japan.

Reference No.

10/28

UNITED KINGDOM

- (1) CORROSION PREVENTION AND PROTECTION
- (2) U.K.I.C.P. CORROSION AND PROTECTION CENTRE, University of York, Heslington, York YO1 5DD, England and Technology, Parkhill Street, Manchester, M13 9PL, England; Contact: Dr. H. P. N. Frimley, Director; Telephone: 2-23-111.
- (3) Mixed; Address: Contact of persons, relevant to the field of corrosion prevention and protection are associated with the Centre; Main nature of business: Research, development, advice and consultancy services, in the field of corrosion prevention and protection.
- (4) A recent British Department of Trade and Industry report attributes total expenditure in the United Kingdom £1,360 million annually, of which £ 60 million is due to the corrosion of steel. This knowledge and techniques. There is evidence which suggests that the amount of steel available in the country and that in all cases very substantial sums of money could be saved. The U.K.I.C.P. Corrosion and Protection Centre was established, from an existing nucleus, in response to the above findings. The main areas of activity of the Centre in the field of corrosion prevention and protection are: (i) fundamental and postgraduate teaching; (ii) fundamental and applied research; (iii) consultancy services; (iv) the provision of independent information, technical materials, etc.; (v) research and development. The Centre has experience, expertise and "know-how" which it will be able to apply to the solution of problems in the field of corrosion prevention and protection, and will be able to provide a wide range of contacts with local industry, through a list of members and their staff.
- (5) The U.K.I.C.P. Corrosion and Protection Centre will be able to provide a wide range of services, including assistance, on a consultancy basis, in the design, construction and operation of corrosion prevention systems in Latin America. Staff of the Centre are available for contact with industry, government, etc. in the field of corrosion prevention and protection in Latin America. The U.K.I.C.P. Corrosion and Protection Centre will be able to provide a wide range of applications for postgraduate teaching, research and development, and will be able to provide a wide range of staff for any new installation. The Centre will be able to provide a wide range of services, including assistance which would be appropriate.

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1) Objectives

2) Learning Objectives

3) Learning Objectives

4) Learning Objectives

Learning Objectives

- 1. Identify the purpose of the heat treatment process.
- 2. Explain the effect of temperature and time on the microstructure of steel.
- 3. Describe the different types of heat treatment processes.
- 4. Discuss the importance of cooling rate in heat treatment.
- 5. Explain the relationship between hardness and microstructure.
- 6. Describe the factors that affect the hardenability of steel.
- 7. Explain the effect of alloying elements on the hardenability of steel.
- 8. Discuss the importance of proper heat treatment procedures.

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- (4) Full knowhow on hot rolling of all types of steel, carbon, alloy, and stainless, from ingots into blooms, slabs, and billets, and secondary hot rolling of wide and narrow coils, wire, and plates up to 6 mm wide. It also relates to hot and cold rolling of sheet.
- (5) Expert advice on selection of equipment and operation: royalty payable in form of royalty up to five percentage of invoice value or quantity. Training of recipient's personnel at Luleå works at Luleå, subject to special agreement. Expert technical assistance available subject to special agreement.

Reference No.
5/8
SWEDEN

- (1) HOT AND COLD ROLLING OF HIGH-GRADE STEEL SHEET
- (2) LUDOVIGS AB, S-141 00 Hagfors, Sweden; Contact: Mr. Stellan Carlsson (Planning, Steel Division), Luleå AB, 901 01 Luleå, Sweden; Tel: 0920 1111
- (3) Private; Share capital: SEK 100; Total no. of employees: 1,000; Main nature of business: Manufacturing of hot and cold rolled high grade stainless steels.

- (4) Full knowhow on the hot and cold rolling of high-grade carbon, alloy, and stainless steel strip, up to 2000 mm wide and in thicknesses down to 0.05 mm; also ancillary operations, such as pickling, leveling and heat treatment.
- (5) Expert advice on selection of equipment and operation: royalty payable in form of royalty up to five percentage of invoice value or quantity. Training of recipient's personnel at Luleå works at Luleå, subject to special agreement. Expert technical assistance available subject to special agreement.

Reference No.
5/9
HUNGARY

- (1) BLOOMING AND SLABbing MILLS OF 1 MILLION TONS CAPACITY
- (2) KÉTI, Planning Institute of the Ministry for Metallurgical and Machine Industries, Post box No. 4, Budapest 14, Hungary; Cable: KÉTI Budapest; Tel: 06 21 11 11; Telex: 21111; Contact: Mr. László Lakáts (Chief Engineer, Member of Board of Directors).
- (3) Governmental; Planning institute; No. of employees: 1500; Main nature of business: Development projects for metallurgical industry, technology and training consulting engineers.

(4) Ingot-slitting mill with 80-100 mm roll diameter, for summer production of 6.2 million tons, produce semi-finished square and flat products of 150-400 mm and 400-700 mm respectively in length. Equipped with change bits, 2-ton transfer and (if required) automatic control.

Two-high reversible mill for roll production of 100,000-250,000 tons of carbon and alloy steels.
From max. 4-ton ingots: 80-150 mm square billets
From max. 4-ton ingots: 80-150 mm square or rectangular plates.
Equipped with heat-treatment plant, cooling bath for slow cooling of high-alloy steels, and equipped with automatic control.

- (5) Manufacturer of steel products: hot finish-rolling, forging, drawing, etc.
- (6) Available according to conditions and payment fixed in commercial contract, to be negotiated. The ground and manufacturing premises, housing station, training of recipient's personnel in Hungary, plants, and technical assistance provided under separate agreement.

Reference No.
5/10
HUNGARY

- (1) HUNGARIAN PLANTS FOR BILLET MILLS
- (2) KÉTI, Planning Institute of the Ministry for Metallurgical and Machine Industries, Post box No. 4, Budapest 14, Hungary; Cable: KÉTI Budapest; Tel: 06 21 11 11; Telex: 21111; Contact: Mr. László Lakáts (Chief Engineer, Member of Board of Directors).
- (3) Governmental; Planning institute; No. of employees: 1500; Main nature of business: Development projects for metallurgical industry, technology and training consulting engineers.

GROUP 12 - WELDING, BRAZING AND JOINING

Reference No.

12/1

AUSTRALIA

- (1) PRODUCTION OF WELDED SHEET PILES
- (2) Dr. SCHLIEF and Co. AG, Fortstrasse 3, A-1011 Vienna, Austria; Tel: 51 21 01 00; Work: 51 21 11 00; Home: 51 21 01 00; Contact: Mr. W. Branger, Ambassador of Australia, P.O. Box 33, 1. Grafton Terrace, Tel. 42 21 01 00, Bonn, Bonn.
- (3) Governmental; Major producer of special and alloy steels; No. of employees: 11,500; Capital: 300 million; Main nature of equipment: Production of alloy and special steels in various forms and finishes.
- (4) Complete knowhow for planning and layout of electron plants.
Supply of mass manufacturing units.
Complete knowhow for manufacturing equipment.
Supply of mass-produced files (incorporating the results of continuous product improvement and development).
Training of personnel in laser work.
Provision of WMA equipment for technical assistance in recipient's works.
- (5) Conclusion of knowhow agreement for specified period. Technology and knowhow normally supplied on royalty basis, with additional cash payments. Licensing arrangements amenable to negotiation. Training and expert assistance can also be supplied, subject to mutually acceptable terms being agreed.

Reference No.

12/2

YUGOSLAVIA

- (1) PRODUCTION LINES FOR WELDED PLATES
- (2) NIPETIPLAC, Welding Division, Ev. Tomasa Dupa, Sofija, G, Yugoslavia; Home: 8-48-1, 8-48-2; Contact: M.Eng. B. Kucav, Department for Scientific and Technical Progress, Ministry of Machine Building, Slavjanske 3, Sofija, Yugoslavia.
- (3) Governmental; State-owned corporation for the design and construction of welding equipment. Main nature of equipment: Research, development, design and construction for special welding equipment.
- (4) Knowhow and equipment for design and construction of production flow lines for welding equipment and plants.

Reference No.

12/3

YUGOSLAVIA

- (1) WIRE FEED DEVICE FOR DEEP-AUTOMATIC AND AUTOMATIC SHIELDED ARC WELDING
- (2) NIPETIPLAC, Welding Division, Ev. Tomasa Dupa, Sofija, G, Yugoslavia; Home: 8-48-1, 8-48-2; Contact: M.Eng. B. Kucav, Department for Scientific and Technical Progress, Ministry of Machine Building, Slavjanske 3, Sofija, Yugoslavia.
- (3) Governmental; State-owned corporation for the design and construction of welding equipment. Main nature of equipment: Research, development, design, and construction for special welding equipment.
- (4) Position of welding electrode wire using the MAG and MIG techniques.
Data on the lampless type planetary wire-feed device:
- | | | | | |
|-----------------------------|---------|--------------|--------|-------|
| Overall dimensions | Length | 110 mm | | |
| | Height | 60 mm | | |
| | Width | 60 mm | | |
| Wire diameter | | 0.1 - 1.0 mm | | |
| Max. speed with 0.5 mm wire | | 3 m/min | | |
| Max. speed with 1.0 mm wire | | 5 m/min | | |
| Relative force of wire | 0.2 mm | 2.0 kP | 1.5 mm | 1 kP |
| | 1.0 mm | 8.0 kP | 1.0 mm | 15 kP |
| | 1 mm | 12.0 kP | | |
| Control of revolution | 30°/min | | | |
| Weight | 300 kP | | | |
- (5) Licensing agreement, covering complete equipment for production of planetary wire-feed device.

Reference No.

12/4

BULGARIA

(1) **APPARATUS FOR MICRO-PLASMA ARC WELDING**

(2) **НИКЕЛЪЕМ**, Welding Division, Kv. Tsvetanovsk, Sofia, Bulgaria; Phone: 22-12-11; Contact: N.Eng. D. Manov, Department for Concentration and Control of Exports, Ministry of Machine Building, Slavyansk 1, Sofia, Bulgaria.

(3) Governmental; State-owned corporation for the design and construction of welding equipment; Main nature of business: Research, development, design and construction for special welding equipment.

- (4) The **IZA-34** micro-plasma arc welding apparatus comprises a power supply unit, a torch, and control and other devices. The power supply unit provides D.C. and A.C. for welding steel and special metal alloys (including aluminum and Al alloys). It has a built-in high-frequency oscillator for arc stabilization. The control devices are on the front of the unit, together with the control buttons. The micro-plasma arc torch can be used for either manual or automatic operation. It is equipped with an on-off switch.

Technical data are as follows:

Over-all dimensions of power supply unit	100 x 100 x 100 mm
Weight of power supply unit	27 kg
Weight of welding torch	0.7 kg
Supply voltage	110 V, 50 Hz
Max. welding current	10 A
Rated welding current	15A/15 - 10%
No-load voltage	30 V
Output	1500
Working gases: plasma argon	0.5 - 1.5 liter/min
protective argon and hydrogen	0 - 10 liter/min
Water for torch cooling	1 liter/min at 10°C
Automatic arc striking using high-frequency oscillator	

- (5) Licensing arrangements negotiable.

Reference No.

12/5

BULGARIA

(1) **SEMI-AUTOMATIC EQUIPMENT FOR CO₂ WELDING**

(2) **НИКЕЛЪЕМ**, Welding Division, Kv. Tsvetanovsk, Sofia, Bulgaria; Phone: 22-12-11; Contact: N.Eng. D. Manov, Department for Concentration and Control of Exports, Ministry of Machine Building, Slavyansk 1, Sofia, Bulgaria.

(3) Governmental; State-owned corporation for the design and construction of welding equipment; Main nature of business: Research, development, design and construction for special welding equipment.

- (4) The semi-automatic equipment for CO₂ shielded arc welding comprises a power supply unit, a wire feed device and a torch. The wire feed device (see reference no. 11/5) is patented (Rev. 10/5 and 11/5). Technical data on the equipment are as follows:

Supply voltage	110 V at 50 Hz
Primary current	11.4 A
Output	1.5 kVA
Rated current	200 A
Duration of operation	Pr = 10%
Gas flowrate	20-5 liter/min
No-load voltage	15-24 V
No. of control steps	34
Diameter of electrode wire	0.2-1.2 mm
Wire feed speed	0.2-1.5 m/min
Length of flexible welding tube	2.5 m
Max. weight of wire load	7 kg
Over-all weight	175 kg

- (5) Licensing agreements may be negotiated, or complete plants for the production of the apparatus may be purchased.

- (1) M.P. 111, Welding Machine, etc. (see item 12/5, page 12/5); Item: 12/5, etc.; Location: K. Soedj. K. Soedj., Department for Development and Training of Technicians, Directorate of Vocational Education, Department of Vocational Education, Jakarta, Indonesia.
- (2) Government of West Java, contract for the design and construction of welding equipment; Research, development, design and construction of manual arc welding equipment.
- (3) Knowledge of the construction of the following range of transformers is available as per number for manual arc welding:

	17A-200	17A-200	17A-200	17A-200	17A-200
Supply voltage V	0	20	20	20	20
Primary winding	50	50	50	50	50
Rated secondary current A	10	10	10	100	500
Rated secondary voltage V	0	30	30	30	30
Rated welding current A	10-100	10-100	10-100	110-450	100-500
Duration of operations hr	0	0	0	0	0
Height of transformer mm	0	0	0	0	0
Weight kg	0	0	0	0	0
Width mm	0	0	0	0	0
Depth mm	0	0	0	0	0
Weight kg	0	0	0	0	0

(4) Knowledge of the construction of the following range of transformers is available as per number for manual arc welding:

- (1) M.P. 111, Welding Machine, etc. (see item 12/5, page 12/5); Item: 12/5, etc.; Location: K. Soedj. K. Soedj., Department for Development and Training of Technicians, Directorate of Vocational Education, Department of Vocational Education, Jakarta, Indonesia.
- (2) Government of West Java, contract for the design and construction of welding equipment; Research, development, design and construction of manual arc welding equipment.
- (3) Knowledge of the construction of the following range of transformers is available for manual arc welding:

	17A-200	17A-200	17A-200	17A-200
Supply voltage V	0/200	20/200	20/200	20/200
Primary winding	50	50	50	50
Rated secondary current A	10	10	10	10
Rated secondary voltage V	30	30	30	30
Rated welding current A	100	100	100	500
Duration of operations hr	0	0	0	0
Height of transformer mm	0	0	0	0
Weight kg	0	0	0	0
Width mm	0	0	0	0
Depth mm	0	0	0	0
Weight kg	0	0	0	0

(4) Knowledge of the construction of the following range of transformers is available as per number for manual arc welding:

Reference No.

12/8

INTEL. WEAPON
OF AMERICA

(1) EXPLOSIVE WEAPON

(a) DENVER RESEARCH INSTITUTE, 1700 P. O. Box 27311, Denver, Colorado, 80227; Phone: (303) 733-1313; Contact: Dr. J. M. Brown, Director of Research and Development, 1700 P. O. Box 27311, Denver, Colorado, 80227.

(b) Private; Share Capital: \$250,000; Employees: 12; Research and development conducted; Manufacturing potential: 100,000 units/year.

- (4) Explosive welding or flaming bond the ability of the explosive weld to join like or unlike materials in similar details, such as lap joints, is a subject of research. The explosive welds are stronger than parent metal strength. The potential investment cost is \$500,000. A cost analysis, to be completed in 1978, the Facility should be based on a 100,000 unit/year rate.
- (5) Extensively heat-treated ferritic stainless steel has been found to have a higher strength than untreated ferritic stainless steel.
- (6) The Denver Research Institute will analyze the Facility, conduct a market survey, and conduct a market survey, if practical and feasible. The Facility will provide all information and data available for subsequent evaluation and financing. The review is offered by the Institute at a price of \$10,000 per year for the first 5 years after the Facility becomes operational. The review fee, however, is paid only when:

Reference No.

12/9

UNIFIED KILNDRON

(1) JOINING BY HIGH-FREQUENCY ELECTRIC HEATING

(a) HOWARD HIGH FREQUENCY (HF), 10000 S. Elm Street, Denver, Colorado, 80231; Phone: (303) 752-8200; Contact: Mr. A.L. Walker (Product Manager, Metallurgy Department).

(b) Private; Part of Howard High Frequency, Inc., a subsidiary of the HF International (formerly part of the HF International, Inc.), 10000 S. Elm Street, Denver, Colorado, 80231; Phone: (303) 752-8200; Contact: Mr. A.L. Walker (Product Manager, Metallurgy Department).

- (2) Jointed pipe with an improved bonding process. The jointed pipe is made of ferritic stainless steel, with some carbon and alloy steels, but it is not a ferritic stainless steel. The process is compared with thermal welding.
- The process has the following advantages:
 - 1. Assembly work and process control is easy to manage.
 - 2. The process is flexible.
 - 3. Jointed pipe has better strength characteristics.
 - 4. Rejects are eliminated, since defects are not allowed.
 - 5. The process is carried out under inert gas atmosphere.
 - 6. After joining, the product is stress relieved.
- The knowhow offered covers the design and fabrication of the jointed pipe, the process of joining for brazing, selection of construction materials, inspection and quality control, and production inspection.
- The basic process has been in use for ten years by all plants, and is being used by the company.
- (5) The advantages listed in (d) above mean that the process has considerable application in aerospace and general engineering industries.
- (6)
 - 1. Outright sale of "package" of plant and technology, including operating manual.
 - 2. Establishment of local vacuum brazing contracts by a local vacuum brazing company, a member with a negotiated investment.
- In either of these cases, expert advice and assistance would be provided during the life of the project.

Reference No.

12/10

SWEDON

(1) BONDING WEAPON

(a) BSAI, P.O. Box 1050, D-10111, Bonn, Germany, 53001; Phone: (49) 228 480 500; Contact: Dr. Wilhelm BSAI, P.O. Box 1050, D-10111, Bonn, Germany, 53001.

(b) Private; Share Capital: \$50,000; Employees: 10; Research and development conducted; Manufacturing potential: 1000 units/year.

12/13

1981

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12/14

1981

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12/15

1981

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Reference No.

12/16

INDUSTRIAL
OF AMERICA

- (1) **FRONTIER WELDING SCHOOL AND WELDING EQUIPMENT**
- (2) **WELDING SCHOOL, 110 North Avenue, New York, N. Y. 10001, Dept. of American
Iron & Steel Institute; Phone: 212-691-1000; Telegram:
WELDER, N. Y. American Institute of Welding.**
- (3) **Industry: Welding School of the American Institute of Welding; No. of employees: 1,000;
Main nature of business: Manufacture of industrial castings and friction materials.**
- (4) **Industry: Division of New York State manufacturing of welding rods for hardening application. Know-how and
equipment are available for licensing.**
- (5) **Know-how and equipment available for the sale, rental and operation of industrial
equipment.**
- (6) **Industry: Division of New York State manufacturing of welding rods for hardening application. Know-how and
equipment are available for licensing.**

Reference No.

12/17

INDUSTRY

- (1) **WELDING SCHOOL, 110 North Avenue, New York, N. Y. 10001, Dept. of American
Iron & Steel Institute; Phone: 212-691-1000; Telegram:
WELDER, N. Y. American Institute of Welding.**
- (2) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (3) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (4) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (5) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**

Reference No.

12/18

INDUSTRY

- (1) **WELDING SCHOOL, 110 North Avenue, New York, N. Y. 10001, Dept. of American
Iron & Steel Institute; Phone: 212-691-1000; Telegram:
WELDER, N. Y. American Institute of Welding.**
- (2) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (3) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (4) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (5) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (6) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**
- (7) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**

Reference No.

12/19

INDUSTRY

- (1) **WELDING SCHOOL, 110 North Avenue, New York, N. Y. 10001, Dept. of American
Iron & Steel Institute; Phone: 212-691-1000; Telegram:
WELDER, N. Y. American Institute of Welding.**
- (2) **Industry: State industrial institute, working on contract basis; subject:
Welding; No. of employees: 100; Main nature of business: Engineering and
welding research and development.**

...with variation in ...

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...Treatment and ...

Reference No.

5/11

MEDICAL

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Reference No.

5/12

ENGINEERING

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Reference No.

5/13

ENGINEERING

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13/4

UNITED STATES OF AMERICA

(1) HANSTEIN STEEL CORPORATION, 1967

(2) HANSTEIN STEEL CORPORATION, 1967, 10000 Steel, Newark, New Jersey, United States of America;
Phone: (201) 426-1000; Telex: 814224 (NORSTEEL); Cable: STEELCORP, Newark, N.J., U.S.A.

(3) Private; Date of award: 1967; Nature of equipment: Manufacture of self-finishing machinery.

(4) The high temperature welding wire was developed in response to the increasing demand for high strength (X401, X402, X403, X404) wire significantly influenced the strength properties of steel. As a result, the use of a high strength wire, major improvements in strength and ductility for a number of the world's leading steel mills.

(5) The process of high temperature welding wire is controlled through a combination of quality control, metallurgy, electrical operations, drawing, thermal treatment and control of atmosphere.

(6) Production of steel wire, in various sizes, for use in wire rod, coil, tube, pipe, wire, cable, etc.

(7) The wire was developed first in the Dallas and then in Newark. The system is prepared by selected wire rod of various sizes, which is then drawn with a method of drawing. The wire is then welded and formed to the finished steel wire, which is then drawn into a final wire of various sizes. Additional information will be available upon request from the manufacturer.

13/5

UNITED STATES OF AMERICA

(1) SAGINAW STEEL CORPORATION

(2) SAGINAW STEEL CORPORATION, Saginaw, Michigan, U.S.A., United States of America;
Phone: (517) 432-4400; Telex: (1917) 22444; Cable: SAGCORP (International Bureau).

(3) Private; Date (1971): 30; No. of employees: 40; Nature of equipment: Specialized wire and cable production machinery.

(4) Galvanizing in the wire industry, where taking into account the hot forming process, metal deformation, voiding, and other, was termed "sagging". This is required by the wire maker in the field of metal forming; and the improvement of the metal wire is a major objective of the wire and metal industry.

(5) The galvanizing process is a two-stage process - first, a wire is drawn from a hot metal rod, then a second stage is performed in which the wire is drawn through a series of rollers, which are heated to a temperature of 400-500°C. The wire is then drawn through a series of rollers, which are heated to a temperature of 400-500°C. The wire is then drawn through a series of rollers, which are heated to a temperature of 400-500°C.

(6) The galvanizing process is a two-stage process - first, a wire is drawn from a hot metal rod, then a second stage is performed in which the wire is drawn through a series of rollers, which are heated to a temperature of 400-500°C. The wire is then drawn through a series of rollers, which are heated to a temperature of 400-500°C. The wire is then drawn through a series of rollers, which are heated to a temperature of 400-500°C.

(7) Applications, power plants, chemical industry, transportation, wire and cable, wire, etc.

(8) 1. Improved design, and thus, the ability to use a high strength wire in applications, in the form of hot wire, and wire, in various applications, such as of electrical, etc., analysis of applicability, etc., in order to allow payment in the form of a wire, and the production of the wire, in question.

2. The following financial arrangements are provided:

- a. Advance payment in advance (based on estimate of time and/or resources) based on preliminary report.
- b. Contractual arrangements. The recipient pays taking an amount not less than five and not more than ten years, with payments in quarterly installments, starting on the effective date of the agreement.
- c. All payments in U.S. currency to a New York bank, without any deduction of taxes.

UNITED STATES OF AMERICA

13/6

UNITED STATES OF AMERICA

(1) HIGHLAND INDUSTRIAL AND EQUIPMENT CORPORATION 1961

(2) HIGHLAND INDUSTRIAL, 40 Hill Avenue, N.W., Atlanta, Ohio 43702, United States of America;
Phone: (614) 352-4400; Telex: 614 352444 (HIGHLAND) or
Dr. Herbert Nyman, 1111 Hill, N.W., Atlanta, Ohio, U.S.A.

(3) Private; Division of Northeastern, Inc.; Date: 1961; No. of employees: 100-500; Nature of equipment: Innovative engineering and sales of metal processing equipment.

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GROUP 14 - MISCELLANEOUS PROCESSES

14/1

- (1) **ALUMINUM TOOLING**
- Aluminum tooling, **Group XII**, **Section 14**; **Classification: 14-1000**; **Index: 14-1000**
- (2) **Private; Subsidiary of A/2 bank**; **Address: 14-1000**; **Phone: 14-1000**
- (3) **The facility and technical information for the design and construction of aluminum tooling, including the design and construction of aluminum tooling, including the design and construction of aluminum tooling.**
- (4) **Planning and organization of companies for manufacture of aluminum tooling.**
- (5) **Training in tool design.**
- (6) **Training in tool manufacture: design, cutting, grinding, and finishing of tooling.**
- (7) **knowhow for series production of aluminum machine tools, including design, cutting, grinding, and finishing of tooling.**
- (8) **Planning, training, and supply of production equipment on payment of cost.**

14/2

- (1) **ALUMINUM TOOLING, GROUP XII, SECTION 14**
- (2) **ALUMINUM TOOLING, GROUP XII, SECTION 14**; **Classification: 14-1000**; **Index: 14-1000**
- (3) **Private; Subsidiary of A/2 bank**; **Address: 14-1000**; **Phone: 14-1000**
- (4) **ALUMINUM TOOLING, GROUP XII, SECTION 14**; **Classification: 14-1000**; **Index: 14-1000**
- (5) **ALUMINUM TOOLING, GROUP XII, SECTION 14**; **Classification: 14-1000**; **Index: 14-1000**

14/3

- (1) **ALUMINUM TOOLING, GROUP XII, SECTION 14**
- (2) **ALUMINUM TOOLING, GROUP XII, SECTION 14**; **Classification: 14-1000**; **Index: 14-1000**
- (3) **Private; Subsidiary of A/2 bank**; **Address: 14-1000**; **Phone: 14-1000**
- (4) **Planning and organization of companies for manufacture of aluminum tooling.**
- (5) **Training in tool design.**
- (6) **Training in tool manufacture: design, cutting, grinding, and finishing of tooling.**
- (7) **knowhow for series production of aluminum machine tools, including design, cutting, grinding, and finishing of tooling.**
- (8) **Planning, training, and supply of production equipment on payment of cost.**

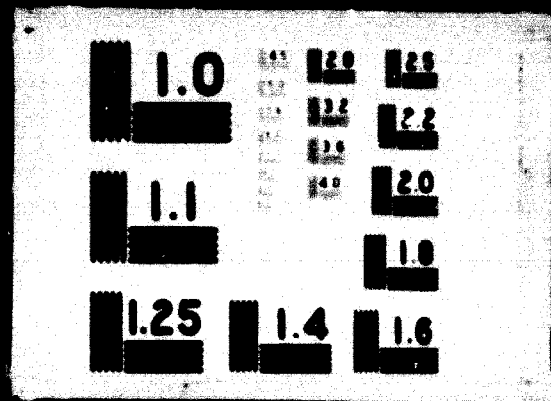


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3 OF 3

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Reference No.
14/4
ALGERIA

- (1) MANUFACTURE OF DENTAL EQUIPMENT
- (2) SOCIETE D'ETUDE DENT, A.S., 11, Avenue des Moulins, Algiers; Capital: Dentaire; Domicile: Algiers; Tel: 0/504; Phone: 0/504.
- (3) Private; Capital: 50 million; No. of employees: 50; Main nature of business: Manufacture of dental equipment.

- (4) Full program for production of dental equipment and instruments, small tools, air-driven instruments, dental technical equipment.
- (5) Various possibilities, subject to individual requirements.

Reference No.
14/5
ALGERIA

- (1) MANUFACTURE OF TURNED CARBIDE TIPS AND TIPPED TOOLS
- (2) S.A. CARBIDE TIPS, 100, Rue de la Liberté, Algiers; Capital: 100 million; Domicile: Algiers; Phone: 1/100; Contact: Mr. J. C. Boudier, Director General of S.A. Carbide Tips, Algiers.
- (3) Private; Capital: 100 million; No. of employees: 100; Main nature of business: Manufacture of turned carbide tips and tipped tools.

- (4) Invest in equipment of factory.
- (5) Payroll, and obtaining the necessary plant and equipment.
- (6) Knowledge from raw material to finished product (turned carbide tips, hard-metal).
- (7) Raw materials: tungsten carbide, cobalt powder, and an oxidized micro-crystalline heavy metal carbide, steel bar and forgings.
- (8) Manufacturing the raw materials into carbide carbide tips and the manufacture thereafter into turning tools and cutting tools which are turned carbide tips.
- (9) Various articles, including and including tools for turning.
- (10) Production of carbide tips.
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Reference No.
14/6
ITALY

- (1) MANUFACTURE OF CONVEYOR-BELT ROLLERS
- (2) ITALIDER S.p.A., via Corvara 4, 10128 Genova, Italy; Capital: Italider Genova; Tel: 100; Italdid; Phone: 100; Contact: Ufficio A.S.I.
- (3) Mixed; Major Italian iron and steel producer; Capital: Lit. 20,000 million; No. of employees: 44,000; Main nature of business: Production of iron and steel.

- (4) Knowledge of the manufacture of various types of roller for use on conveyor belts.
- (5) Special service rollers: special Italider system, with high efficiency and reliability.
- (6) Special service rollers: suitable for extremes of climate from -100°C to +100°C, for highly corrosive atmosphere (e.g. in chemical plants), for the transport of sensitive material in the presence of strong magnetic fields, or for transport of extra large and/or heavy materials.
- (7) The rollers are designed in such a manner as to require no lubrication.
- (8) The rollers are fabricated from hardened steel tubes; a special feature is the use of special non-lubricated bearings.
- (9) Integrated assistance programmes, implemented by Italider staff in recipient's works and training of recipient's personnel in Italider works. The various possible conditions of transferring the know-how will be discussed on application from potential recipients.

- (1) PRODUCTION OF PRECISION ROLLER CHAINS
- (2) FRANZ FOLMAYER GmbH, Siebenbrunnengasse 7, A-1001 Vienna, Austria.
- (3) Private; Capital: \$35 million; Sales: \$35 million; No. of employees: 1000; Main nature of business: Production of precision roller chains.

14/7

- (1) MANUFACTURE OF BRASS SANITARY FITTINGS AND VALVES
- (2) LONNISTON Oy, P.O. Box 10, Finland; Cable: Armet; Telex: 2111 Armet FI; Phone: 250-11970.
- (3) Private; No. of employees: 1000; Main nature of business: Manufacture of brass and valves.
- (4) Complete knowhow for manufacture of sanitary fittings and valves.
Product planning: product development; making and testing of prototype; preparation of complete operational plans.
Operations planning: construction; materials handling; work scheduling; setting up of machinery; pressure die casting; cleaning; machining; grinding; buffing; painting; assembly; etc.
- (5) Lump-sum payment 1/3 when ordering, 2/3 for delivery of final documents.

14/8

- (1) FABRICATION OF ALUMINIUM ALLOY DOORS AND WINDOWS
- (2) MONTECATINI EDISON S.p.A., Foro Buonaparte 11, P.O. Box 456, Milano, Italy; Cable: Montecatini; Telex: 31009; Phone: 2100; Contact: Dr. Roberto Frignani (Manager, Process and Product Development - DIM), Montecatini Edison S.p.A., Foro Buonaparte 11, Milano.
- (3) Private; Capital: Lit. 129 billion; Sales (1970): Lit. 109.7 million; No. of employees: 52,078; Main nature of business: Manufacture of chemicals, metals and ferrous alloys.
- (4) Fabrication of windows, doors, sections, and panels in aluminum and its alloys, including the following:
 - Engineering and design of sections and panels.
 - Fabricating techniques for windows and doors from sections and laminates.
 - Manufacture of sections and laminates.
 - Finishing techniques (anodizing, painting, etc.).
 - Assembly techniques.
- (5) Licensing arrangements against payment of lump sum covering expenses connected with transfer of technology plus annual royalty - to be negotiated with recipient. Transfer of technical personnel who will be in charge of plant operation. Technical assistance for technology transfer and start-up of plant.

14/9

- (1) FABRICATION, WELDING, AND HOT-DIE GALVANIZING OF LATTICE-TYPE STRUCTURES
- (2) PAINTER BROS. LTD., Marlmer Road, Hereford, United Kingdom; Telex: 25771; Phone: Hereford 2101; Contact: Mr. H. Weatherall (Director and General Manager).
- (3) Private; Capital: £2 million; Sales: £4 million; No. of employees: 100; Main nature of business: Structural engineers specializing in design, testing and fabrication of lattice-type structures.
- (4) Knowhow in metallurgical processes - fabrication, welding, and hot-die galvanizing - of lattice-type structures.
- (5) Electrical transmission towers, television and radio masts, bridges, etc.
- (6) Knowhow or technique agreement based on negotiated:
 - initial "goodwill" payment.
 - consultancy fee.
 - annual royalty.

Reference No.

14/10

UNCLASSIFIED

A patented light distribution pole is also available for licensing, either separately or in conjunction with a general agreement. Expert assistance and/or advice in design of layout, selection and design of specialized plant, jig and tool requirements, planning and control can be given and on-site assistance offered, followed by consultancy role for advice on specific problems that may arise.

Reference No.
14/11
MINISTRY

(1) KNOWLEDGE OF VISIONS FROM NO. 11 ALUMINUM

Corporative Metallwerke, KESCHOPFEN-DECHORF 41, A-5000 Rannhofen-Brannau/Inn., Austria;
Phone: UNIKTEL BRANNAU INN; Telex: 217142 (Austria), 217142 (West G);
Telex: (GTR) 217142; Contact: Dr. Marie Thaler-Saler Marquard.

(2) Governmental; Leading producer and manufacturer of aluminum and aluminum products
and semi-finished copper and copper alloy products in Austria; Capital: \$ 410 million;
Sales: \$ 500 million; No. of employees: 6,200; Main nature of
business: Production of tube, bar and sections in copper, aluminum, and its alloys.

- (a) Knowhow available in the fabrication of tubes and their assemblies in extruded aluminum sections. The types of fabrication available cover a wide range of sizes and applications. A number of patented techniques for corner joining, hinge joining, cladding and welding are also offered. The knowhow would include fabrication techniques, drawings, models, technical assistance, and training.
- (b) The knowhow would have applications in residential, hotel, industrial, business, hospital, etc. buildings in temperate and tropical climates.
- (c) Subject to individual negotiation.

Reference No.
14/12
MINISTRY

(1) QUALITY CONTROL FOR BALL-BEARING STEEL

RESEARCH INSTITUTE FOR FERRIC METALS, P.O. Box 11, Budapest 11, Hungary;
Phone: 250-000; Contact: Mr. Paul Csiky.

(2) Governmental; No. of employees: 200; Main nature of business: Research and development in ferrous metallurgy.

- (a) The quality control of ball-bearing steels is based on the determination of the cleanliness of the steel (i.e., its freedom from non-metallic inclusions). However, this is not only to be accomplished by means of a method by means of which the tendency to pollution can be assessed and used as a criterion for the cleanliness of ball-bearing steel, in the form of hole-free, polished bars.
- (b) Manufacture of ball-bearing and other types of products in which cleanliness is important.
- (c) Knowhow and technical assistance, subject to negotiation. An agreement can also be reached in Hungary.

Reference No.
14/13
MINISTRY

(1) MANUFACTURE OF ROLLS FOR ROLL-MILLING MILLS

SHAWWORTH ENGINEERING WORKS, Post Box 120, D-7000 Wiblingen-Jaht, Federal Republic of Germany; Telex: 4272441 Thawo GERMANY/FRG.

(2) Private; Capital: 100 million G.M.; Sales: 60 million; No. of employees: 11,000;
Main nature of business: Iron and steel products.

- (a) Special knowhow, experience: Cold rolling; reheat heat treatment; annealing; rolling.
- (b) Special steel rolls for cold rolling mills.
- (c) An agreement will be negotiated which will cover the installation of equipment and its operation including periodic control and various finishing techniques. The scope and terms of the contracts will be negotiated for each particular case.

Reference No.
14/14
MINISTRY

(1) EXPANSION OF STRUCTURAL STEELWORK

SARGENT AND JUDYER (PATENT) LIMITED, 1, Abchurch Lane, London E.C.4, United Kingdom; Contact: S. J. Sargent; Telex: 525240; G-57000; Contact: Dr. S. J. Sargent also in Hungary.

(2) Private; Member of Chartered Institution of Engineers; Main nature of business: Structural steelwork including and fabrication.

- (4)
 - 1. General technology in manufacture of structural steelwork, including design, cutting, welding, finishing (shot-blasting, spraying) and general machinery.
 - 2. Design, manufacture, and erection of single-storey, finished steelwork industrial buildings, clear portal, tied portal, and crane building type.
 - 3. Manufacture of steelwork components and design data for RC/SB construction of multi-storey structure up to 6-8 storeys, suitable for building schools, offices, hospitals, libraries, etc.
 - 4. Design, manufacture, and erection of composite concrete/steel frame for high-rise buildings projects, known as MULTIBUILD.
- (5) Structural steelwork industry.
- (6) By licensing arrangements basically covering:
 - a. (i) Single one-for-all payment (in lieu of (ii), (iii), and (iv)) or alternate with:
 - b. (i) A down payment to cover initial costs in preparing technical data to be licensed.
 - (ii) An annual royalty of an agreed percentage on the net contract value.
 - (iii) A minimum annual royalty (payable in advance).
 - (iv) An agreed period of years.
 - (v) Training in UK factories of licensee's personnel.
 - (vi) Visits of UK technicians to overseas licensees.
 - (vii) Maintenance of technical support and knowhow during license period.

Reference No.
14/15
SECRET

- (1) GENERAL TECHNICAL ASSISTANCE IN METAL TRANSPORTING TECHNOLOGIES
- (2) METAALINSTITUUT TNO, Post Box 50, Delft, Netherlands; Telex: 22009; Phone: (015) 1914; Contact: Mr. J.L. Barmarwaal (Director of Production Engineering Research).
- (3) Mixed; Part of Organisatie voor Natuurwetenschappelijk Onderzoek TNO (Central Organization for Applied Scientific Research); Annual budget: \$18.75 million (1974); No. of employees: 4,000; Main nature of business: Research and development.
- (4) Metaalinstuut TNO has experience, and can offer expert technical assistance in the following areas:

	Research and Development	Industrial Applications	Training
Cold working	X	X	X
Hot working	X	X	X
Explosive forming	X	X	X
Forming	X	X	X
Sheet metal working	X	X	X
Extrusion	X	X	X
Casting	X	X	X
Heat treatment	X	X	X
Welding	X	X	X
Finishing	X	X	X

- (5)
 - a. The fee for stagiaires for training in the Metal Research Institute TNO will be about \$100 per person per month.
 - b. The charges for advisers sent out by the Organization will be in the range of \$100-200 per person per day, exclusive of travelling expenses and daily subsistence allowances.
 - c. Auxiliary educational materials and/or learning devices for courses that may be given in the countries where the pertinent knowhow is to be transferred financially, may be at the price of about \$5,000 per set.

Reference No.
14/16
SECRET

- (1) MANUFACTURE OF STEEL AND ALUMINIUM DOORS
- (2) FELIX WALDNER, Kapplainerstrasse 26, A-4020 Linz, Austria; Telex: 02-1444; Phone: (01222) 37673/393.
- (3) Private; No. of employees: 126; Main nature of business: Production and sale of steel doors, garage doors.
- (4) Knowhow on manufacture of new types of gates and doors in steel and aluminium. Manufacturing techniques are used which enable high rates of production to be obtained. The daily use of jigs, welding techniques and materials have been developed for fabricating the steel and aluminium.
- (5) Manufacture of aluminium and steel doors and gates.
- (6) Licensing arrangements for production of complete door and gate assemblies.

Reference No.
14/17
UNITED KINGDOM

(1) TECHNICAL INFORMATION ON TIN AND ITS USES

(2) TIN RESEARCH INSTITUTE, Fraser Road, Perivale, Greenford, Middlesex, United Kingdom; Phone: 01-997 4454; Cable: Tinresearch, Greenford; Contact: Mr. D.A. Robins, Assistant Director, Tin Research Institute, Fraser Road, Perivale, Greenford, Middlesex, United Kingdom.

(3) International; Headquarters staff: 25; Offices in Brussels, Ohio, Düsseldorf, The Hague, Milan, Rio de Janeiro and Tokyo; Main nature of business: Developing the uses of tin.

(4) The work of the Tin Research Institute is directed to develop the use of tin and is based on scientific and technical study of the metal, its alloys and compounds, and of industrial processes which use tin or may provide future markets.

The whole group of organizations controlled by the Council is engaged in spreading knowledge of tin throughout the world. This is effected by publishing the results of research, by contributing to the technical and trade press, by issuing practical handbooks, by giving lectures, by participating in exhibitions and trade fairs, by practical demonstrations of tin-using processes, and by consultations at user's works.

The Institute publishes a wide range of technical literature relating to the uses of tin and also produces a quarterly journal "Tin and its Uses" in six languages.

(5) Technical help and advice relating to the uses of tin is given free of charge.

Reference No.
14/18
FRANCE

(1) PRODUCTION OF STEEL SHOT AND GRIT; PRODUCTION OF CAST IRON SHOT AND GRIT

(2) POUDRES ET GRENAILLES METALLIQUES (P.G.M.), rue A. de Vigny, 1008 Paris, France; Contact: Mr. J. Thomé.

(3) One of the most prominent European companies to specialize in the production of cast iron and steel shot and grit; 40% of the production is sent for export; Main nature of business: Production and sales of shot and grit.

(4) The main processes of the production are as follows:

- Pouring liquid metal on to water jets.
- Drying and screening.
- Grinding.
- Heat treatment.

The P.G.M. company could also supply specific machines such as:

- Water jets.
- Movers and grinding mills.
- Heat treating furnaces.

(5) Cleaning of foundry parts (removing sand and carbonaceous material) and forged parts; cleaning the metallic surfaces before painting, enamelling coating.

(6) Commercial and technical assistance; payment cash for cash; royalties on the turnover with a minimum amount guaranteed.

Reference No.
14/19
AUSTRIA

(1) MANUFACTURE OF LOCKS FOR DOORS AND FURNITURE

(2) HERR. GRUNDMANN, GmbH, P.O. Box 11, A-1100 Herzogenburg, Austria; Cable: GRUNDMANN, Herzogenburg; Telex: 015-252; Phone: (02732) 451; Contact: Dfkm. Erich Buxbaum (Director).

(3) Private; oldest and biggest lock manufacturer in Austria; No. of employees: approx. 1,100; Main nature of business: Manufacture of locks and foundry for cast iron and light metal.

(4) Technology and know-how for manufacturing all sorts of locks and similar articles. Planning of complete lock factories, assembling works or parts of such; elaboration of all designs or drawings; supply of raw material, unfinished, half-finished and finished parts for assembling; fabrication and supply of special tools and machines. Special section: technology and knowhow for cylinder locks and master-key installations.

(5) Licences depend on the required technology and/or know-how. For example, technology and knowhow for a complete lock factory are supplied against 1/3 - payment with facilities (certain advance plus acceptance letter of credit) depending on the volume of the product. Technology and knowhow for cylinder and master-key systems are supplied on a royalty basis plus fixed payment.

14/20

(1) ENGINEERS' CUTTING TOOL MANUFACTURE

(2) SAMUEL OSBORN AND CO. LTD., Clyde Steel Works, P.O. Box No. 1, Sheffield S11 1BP, United Kingdom; Cable: Osborn Sheffield; Telex: 54385; Phone: (0542) 22001; Contact: Mr. E.W. Foster (Group Project Manager).

(3) Private; An international group of companies founded 1854; Capital employed: £13 million; Sales: £20 million; No. of employees: 7,000; Main nature of business: Manufacture of high-quality steel bars, extruded steel sections, rolled sheets, cutting tools, etc.

(4) A comprehensive package covering curvey - all current process, product, equipment and operating technology and knowhow for high volume flow line manufacture of superior quality high speed steel twist drills, reamers, threaded cutters, chucks, toolholder bits and lathe tools from bar and coil material etc. Osborn will consider separation of any part of the product knowhow and technology offered to meet particular interests.

Construction, layout, equipment and services are based upon a nominal output capacity of some 10 million pieces per annum of current sales value of approximately £12 million, requiring capital expenditure in the order of £3 million, and some 1,400 tons of bar and coil material per annum. This material is available from the steel producing companies within the Osborn organisation.

Main finished products are straight and taper Shank twist drills in a comprehensive variety of common, fractional and metric sizes and types, and parallel and tapered reamers for hand and machine application. The range of threaded Shank cutters includes end mills, slot drills, reamed cutters, woodruff cutters and ripping cutters. Face mills and side and face cutters are manufactured with plain and threaded bores. The Osborn-Mushet range of Titanic Chucks and chuck accessories are designed with many special features to accommodate a wide range of milling cutters, and to give fast cutting and long life. Toolholder bits are produced in square, rectangular, round, bevel, and double bevel sections in lengths to suit all standard toolholders. Special purpose cutting tools are manufactured to specified requirements.

Manufacturing techniques and facilities include sawing, abrasive cutting, turning, friction welding, milling, broaching, grinding, straightening, heat treatment, finishing procedures, jigs, fixtures, devices and all materials handling equipment.

Back-up knowhow is offered covering project management requirements and procedures from a green field start to a fully operational unit including drawings, layouts, diagrams, planning, cost and progress control techniques. Technological and operational guidance and information is available in respect of plant selection, product and material range, product manufacturing routes, product performance, quality standards and control, servicing requirements, production planning and control, cost control, manpower requirements and management organization and staffing.

The processes and technology offered are established and operated by Samuel Osborn's subsidiary company, Osborn-Mushet Tools Limited at Sheffield, England.

(5) Proposed manner and conditions for supplying the technology and/or knowhow:

Implementation sequence

- Step 1. Preliminary exchange between Osborn and recipient to establish mutual interest.
2. Preliminary survey visit to establish specific parameters of requirements.
3. Preparation and submission of written survey, report and proposals.
4. Negotiation and finalization of proposals, financial, commercial and contractual terms.
5. Invitation for recipient to visit Osborn to see and discuss the pertinent techniques and procedures.
6. Osborn to supply reports, documentation, manual instructions, photographs as may be agreed.
7. Osborn to provide and/or arrange for expert assistance as may be agreed.
8. Osborn to train recipient personnel in such techniques.
9. Osborn to service project operation on contractual basis as may be agreed.

Commercial Policy

Step 1 will involve no expense to the recipient.

Steps 2, 3, 4 and 5 will be carried out on an invoice basis for plus expenses reimbursed by the recipient in accordance with requirements.

Steps 6, 7, 8 and 9 will be carried out on an invoice basis for plus expenses, plus paid by the recipient in accordance with requirements and in addition will be open to consideration of royalty and/or joint-venture arrangements.

Reference No.

14/21

JAPAN

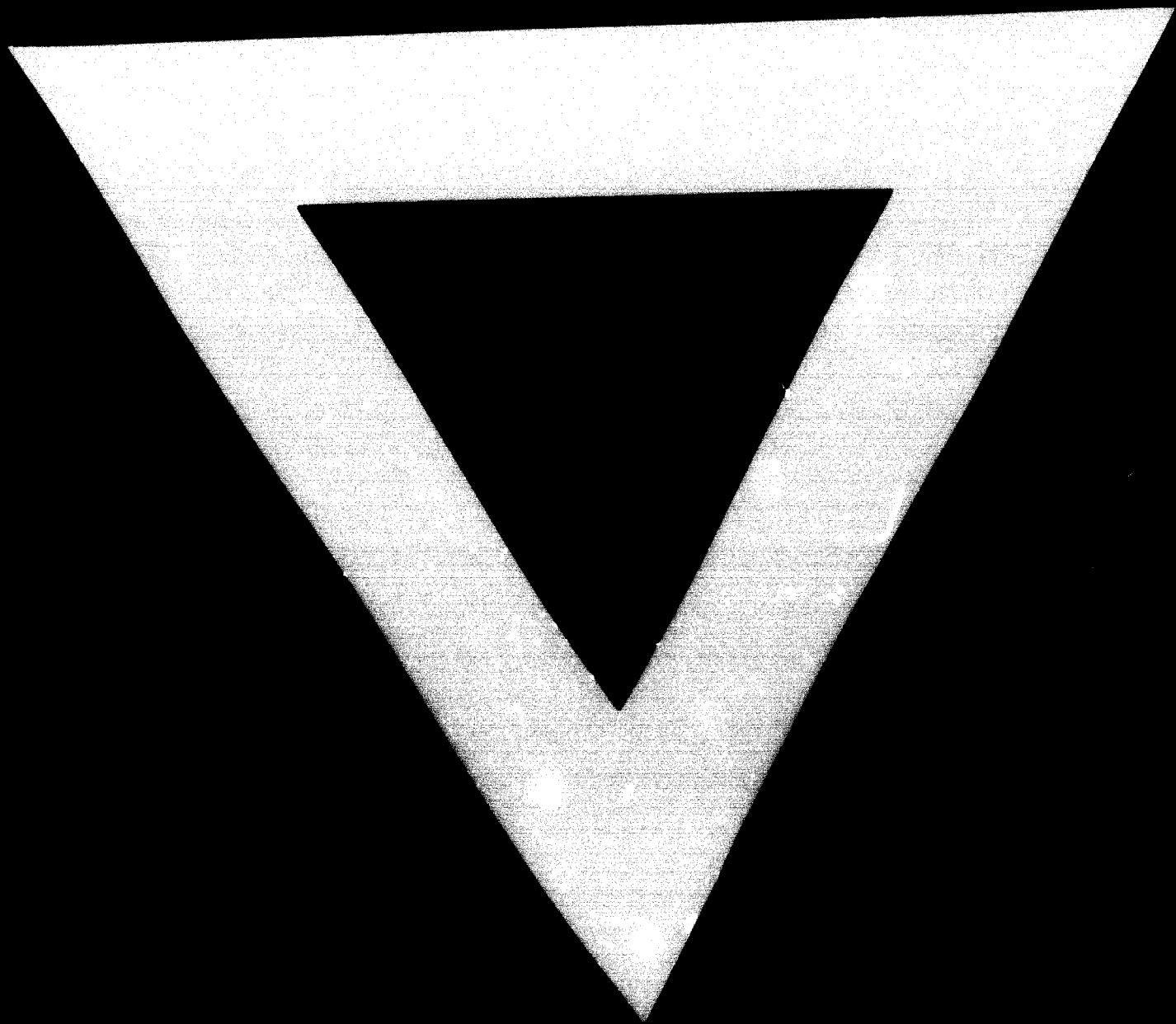
(1) PRODUCTION TECHNOLOGY OF TAPERED POLE

(2) SUMITOMO METAL INDUSTRIES LTD., 15 Kitahama 5-chome, Higashi-ku Osaka, Japan; Cable: SUMITOMETAL OSAKA; Telex: 33490; Phone: 06-226-5111.

(3) Private; Capital: ¥ 2,000,000,000; Sales: ¥ 1,000,000,000 (FY 1987, FY 1988, FY 1989); No. of employees: 10,000 (at end of 1989); Main nature of business: Production and sale of carbon steel rolled products, alloy steel rolled products, forging, casting, rolling stock parts and fabrication.

(4) Production technology of tapered pole, covering V - C forming, edge truing, automatic welding, laminating, special joint, form of base plate, stress relieving at expansion part and winding mechanism.

- (5) 1. Engineering service at the construction of facilities.
2. Technical assistance of operation and quality control.
3. Training at our plant in Japan.



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