OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

23380

Indian Technical Delegation of Building Materials Manufacturers to Italy

13-17 November, 2006

A Report

Building Materials & Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation, Government of India
Core-5A, 1st Floor, India Habitat Centre
Lodhi Road, New Delhi – 110 003, India

International Centre for Advancement of Manufacturing Technology
United Nations Industrial Development Organisation
Core-5B, 1st Floor, India Habitat Centre

Content

Technical Delegation of Building Materials Manufacturers to Italy, 13-17 November, 2006

1. BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL (BMTPC)

The Building Materials and Technology Promotion Council (BMTPC) is an inter-ministerial autonomous body functioning under the aegis of the Ministry of Housing and Urban Poverty Alleviation, Government of India. The Council is primarily engaged in development and promotion of cost effective building materials and construction technologies for housing and building sector. It aims for development and promotion of alternative building materials and housing technologies through interaction with building materials manufacturers, financial institutions, construction agencies, research institutions and NGO's at national and international levels. The focus areas of BMTPC, inter alia, includes the promotion of environment friendly and energy efficient building materials based on agro-industrial wastes and locally available resources, disaster resistant building technologies including those with seismic retrofitting, training and knowledge through dissemination programmes for practicing architects, engineers, builders and grass root construction workers to generate awareness about alternatives building materials and housing technologies.

2. INTERNATIONAL CENTRE FOR ADVANCEMENT OF MANUFACTURING TECHNOLOGY (ICAMT)

International Centre for Advancement of Manufacturing Technology (ICAMT) is an Centre established by United Nations Industrial Development Organization (UNIDO) in India, in co-operation with the Government of India with a view to enhance manufacturing capabilities and competitiveness of building materials and construction industry in developing countries. ICAMT mission is to bridge the technological gap between the developing and developed countries in the area of cost effective housing technologies through organization of seminars, training programs and technical visits. The

centre has taken initiatives to promote proven Indian technologies for manufacturing of alternative building materials based on agro-industrial wastes in the developing countries.

3. Background

During last one and a half decade Building Materials & Technology Promotion Council, Ministry of Housing and Urban Poverty Alleviation, Govt. of India has played a major role for the development and promotion of the cost effective building materials and housing technologies in India. Council had conducted large number of seminars, training programs and exhibitions for dissemination of these technologies at national and international levels. UNIDO has also played an important role by extending technical and financial support to the Council at several occasions for organization of various such activities in India and other developing countries of Asian-African regions. Most of such programs were primarily focused on the scientific & technical deliberations and interactions between various resource persons and the potential users/adopters of the technologies. Few programs in India and abroad were also targeted for setting up the Technologies Demonstration cum Production Centre as per the need of the various developing countries. While conducting these programs it was felt that for apart from these programs some technical industrial visit of Indian Building Industry to have an interaction between developed countries and Indian industry is also required, so that both side can discuss and learn by sharing knowledge from each other experiences. Keeping this objective in mind BMTPC and UNIDO-ICAMT had planned an Indian Delegation to Italy to initiate interactions and explore the future collaborations/cooperation between Indian and Italian building materials industry.

4. Scope and Objectives

The objectives of the visit were to bring small and medium scale building materials industries of both the countries at a common platform. The visit provided an opportunity to representatives from Indian side to show case their products & technologies in Italy at various places at industries level

and at the same time learn from Italian counter part about more advanced plant and machineries related to cement, concrete and ceramic industries. Visit to the construction and demolition waste recycling plant is also an important part of this visit in the light of growing awareness for recycling of wastes in India, fast depletion of the natural resource and scarcity of basic raw materials for production of building materials.

These meetings and visits would provide a chance to building materials industry representative's of both the countries to identify the various materials, products, machines and technologies having potential to get transferred to other country. BMTPC & ICAMT-UNIDO will play an important role as facilitators in the process and extend all technical and administrative support and pursuing the matter at industrial and government levels to start the process of technology transfer.

5. Program details for delegation visit

Day 1 - 12 November 2006	
0230 hrs 1230 hrs 1400 hrs	Departure to Trieste from New Delhi Arrival at Trieste Airport Transfer to Hotel Impero, Trieste
Day 2 - 13 November 2006	
0900-0930 hrs	Departure from Hotel Impero, Trieste & Arrival at Area Science Park, Trieste
0930-1300 hrs	Visits to the ICS-UNIDO and Area Science Park, Trieste
1300-1400 hrs	Lunch Break
1400- 1700 hrs	Introductory meetings with representatives of different organizations/associations and presentation by the Indian Delegation at Area Science Park, Trieste
1700-1730 hrs	Departure from Area Science Park, Trieste & Arrival at Hotel Impero.
Day 3 - 14 November 2006	
0800-0930 hrs	Departure from Hotel & Bus transfer from Trieste &

	Arrival at Udine Industrial Area.
0930-1300 hrs	CATAS, Res.& Dev. Lab. of Wood Based Products
1300-1400 hrs	Lunch Break
1400-1700 hrs	CHENNA, Wood-Plastic Composites Products
1700-1730 hrs	Departure from Udine Industrial Area & Arrival at Hotel Impero.
Day 4 - 15 November 2006	
0800-0930 hrs	Departure from Hotel & Bus transfer from Trieste to Tolmezzo Arrival at Industrial Area Tolmezzo
0930-1300 hrs	EURO HOLZ - Laminated Timber Product
1300-1400 hrs	Lunch Break
1400-1700 hrs	SNAIDERO – Interior Furniture Enterprise
1830 hrs	Departure from Tolmezzo & Arrival at Hotel Impero.
Day 5 - 16 November 2006	
0800-0930 hrs	Departure from Hotel & Bus transfer from Trieste to Treviso Arrival at Industrial Area Treviso
0930-1300 hrs	ENCO – Research. & Development Laboratory for Concrete Products
1300-1400 hrs	Lunch Break
1400-1700 hrs	FASSA BORTOLO – Maintenance, Decoration and Cement Based Products
1830 hrs	Departure from Industrial Area Treviso & Arrival at Hotel Carletto, Treviso.
Day 6 - 17 November 2006	
0800-0930 hrs	Departure from Hotel Carletto, Treviso & Bus transfer from Treviso to Padova Arrival at Industrial Area Padova
0930-1700 hrs	PESCALE ROSE Plant – Debris Materials Recycling Plant
1300-1400 hrs	Lunch Break
1830 hrs	Departure from Industrial area Padova & Arrival at

	Hotel Impero, Trieste
Day 7 - 18 November 2006	
0930-1030 hrs	Closure meeting/concluding remarks/future actions

6. Names and Delegation Composition:

S. No	Name of participant	Technology/product details
1	Mr Nikhil Jain Proprietor ESPEE Industries 1521/B-8,Wazir Nagar Opp. Defence Colony, Kotla Mubarakpur New Delhi-110003	Manufacturer conventional and alternative doors and window farms
2	Mr N N Patel G M manufacturing Neptune Equipments Limited, Mehsana -384004, Gujarat	Manufacturer of plant and machinery for fly ash based building components
3	Mr Nilesh Bhatt Proprietor Shree Sahjanand Enterprises, 2, Parasmani, New Station Road, Bhuj-370001 Gujarat	Manufacture for medium scale fly ash brick manufacturing plant and machinery
4	Mr Sandeep Dave Director Marketing Neptune Equipments, Mehsana -384004, Gujarat	Supplier and manufacturer of plants and machinery for building ceramic manufacturing units
5	Mr Sachin Joshi Chief Executive Officer S K Formulations R-406, TTC Industrial Area, M.I.D.C, Rabale, Navi Mumbai-400701	Manufacture of anti corrosive paint, pigments, coating and admixtures etc.
6	Mr Panchel Hardik Manager-Project Development	Doors shutters and window frame manufacturer including the agro

	Rushil Decor 1,Krinkal Apartments Mahalaxmi Society Paldi, Ahemdabad-380007	waste based doors shutter
7	Dr. Kusum Joshi Director S K Formulations R-406, TTC Industrial Area, M.I.D.C, Rabale, Navi Mumbai-400701	Manufacture of anti corrosive paint, pigments, coatings and admixtures etc.
8	Mr Sunil Aggrawal Proprietor In-Global Resources I-3, Level II, Kirti Nagar New Delhi-110015	company manufacturing Fly ash-lime-gypsum based building products
9	Mr Rishi Pal Manager Technical Euro-Asia Eco-tech I-3, Level II, Kirti Nagar New Delhi-110015	Company manufacturing plant and machinery for producing Fly ash-lime-gypsum based building component
10	Dr Amit Rai Development Officer BMTPC (Ministry of Housing and Urban Poverty Alleviation) Govt. of India, Core 5A, First Floor, India Habitat Centre, Lodhi Road, New Delhi-110003	Development and commercialization of building materials technologies , training, international cooperation
11	Mr N Jaychandran Deputy Director (BSUP) Ministry of Housing and Urban Poverty Alleviation, Government of India 'G' Wing Nirman Bhawan, New Delhi-110001	Dealing with various schemes related to building materials and housing technologies of the ministry

7. Details of the Companies Visited During the Tour:

Company Name:
Area Science Park Consortium

Address:
Padriciano 99
34012 Trieste (Italy)
Ph: 39.040.375 5111
Fax: +39.040.226698
E-mail: info@area.trieste.it
Web: http://www.area.trieste.it

Background:

Since the opening of the first laboratories on the karst hills surrounding Trieste in 1982, the Area Science Park has established itself as one of the leading multi-sartorial scientific parks in Europe. Its main goal is to encourage the development of the surrounding region through the impetus of innovation, by creating a permanent link between research and the business world.

The Area currently has over 1400 persons working in its 60 companies, centers and institutes engaged in R & D, technology transfer, training, and specialized services.

Management and Development of Area Science Park

The park is managed by the Area Science Park Consortium, a public body which members include the universities of Trieste and Udine, the National Research Council, and the leading local and national scientific institutions, as well as the Friuli-Venezia Gulia region and the principal local public organizations of the region.

Within the park, the Consortium is responsible for area-planning aspects of the site and the construction of buildings, equipped laboratories, installations and plants, general services, and the promotion and visibility of the Area Science Park, and establishes links with external institutions and partners. It also offers establishments at the Park services of advanced telematics,

financial advice, marketing of technologies and innovations, and assistance regarding health and safety in the workplace.

The Consortium activities can be grouped as follows:

Promotion of the development of the Science Park

- Establishment of laboratories, research institutes and companies active in the sectors of high technologies and advanced services;
- Activities as business intermediary and supporting co-operative and contract research;
- Promotion of clusters in the sectors of activity of the Park, with the goal of fostering synergies, sharing of resources and strengthening of the technologies offered;
- Development of new branch offices within the region.

Exploitation of R & D activities

- Exploitation of the economic and industrial spin-offs of research, including the creation of scientific and industrial partnerships for projects with international outlook;
- Support for the competitiveness of enterprises in the Friuli-Venezia Giulia region, through services of technology transfer and dissemination of innovation;
- Assistance in the creation of new knowledge-based enterprises and of spin-offs from research activities;
- Promotion and management of national and international R & D programmes and of exploitation of research.

Advanced training for innovation of enterprises and public administrations, with particular reference to specialization on technologies and management with extensive reliance on IT and telematics technologies.

Company Name:
The International Centre for Science and High Technology

Address:
ICS-UNIDO, AREA Science Park
Padricano 99, 34012
Trieste, Italy
Tel +39-040-9228111
Fax +39-040-9228101
info@ics.trieste.it

Background:

ICS is an international technology centre of the United Nations International Development Organization (UNIDO), created to assist countries in their industrial development through technology transfer programmes. ICS operates in Trieste, Italy, under the aegis of UNIDO, the only worldwide organization dealing exclusively with industry from a development perspective. As part of UNIDO, the Centre shares its broad goals to create a better life for people by laying industrial foundations for long-term prosperity and economic strength. UNIDO and ICS have complementary programmes, expertise and instruments. To reach its beneficiaries, ICS works through its own channels as well as UNIDO's global network of industries, governments, organizations, agencies and financial institutions.

Chemistry, the environment, and high technology and new materials constitute the three programme areas. Cross-area support takes the form of advanced IT tools for technology assessment and decision support, IT development and technology management, project promotion, publications and administration.

The three scientific areas of operation are shown here with their subprogrammes:

Pure and applied chemistry

- catalysis and sustainable chemistry
- environmentally degradable plastics

- remediation
- combinatorial chemistry and technologies

Earth, environmental and marine sciences and technologies

- decision-support systems for sustainable industrial development
- coastal zone management
- industrial utilization of medicinal and aromatic plants

High technology and new materials

- laser applications and optical technologies
- new materials
- renewable energies
- telecommunication technologies

Frequent **expert group meetings** are held to give guidance and updates on aspects of the programme.

Company Name:
CATAS SPA

Address:
Via Antica 24/3
33048 San Giovanni al Natisone
Udine Italy
Tel: +390432747211
Fax: +390432747250
E-mail: comunicazioni@catas.com
Web: www.catas.com

Background

CATAS gives certification service since 1993 with the CATAS QUAUTYAWARL label, proving the conformity of products to the relevant standards and technical specifications.

Companies aiming to offer greater added value to their customers, can certify their products through the continuous; systematic intervention of an independent body.

Physical-Mechanical Tests

Physical-mechanical tests are carried out on raw materials, components and furniture fittings. They aim to verify such properties of the massive wood, wooden panels, plastics, metals, textiles, adhesive tapes, laminated wood profiles, pallets, belts. glues, adhesives and glued joints, upholstery foams, mechanical fastening systems, Similar tests can be also carried out on fittings or semi-finished products such as hinges, locks and catches, furniture feet.

Chemical and Microbiological Analysis:

Chemical analyses are carried out in order to identify the composition of materials, to emphasize the safety and their technical suitability to the use. The content and the emission of harmful substance (formaldehyde, heavy metals, etc.) are checked. The constancy of the quality of different materials (coatings, adhesives, plastics, panels and wood preservatives) is also controlled. The tests on the furniture surfaces give information on the behavior of these parts of tables and desks, chairs or shelves which are submitted to impacts, thermal shocks, abrasions, scratches, cigarette burns, stains, corrosion, etc. It is possible and easy /to verify by means of relevant tests, avoiding the raising of defects during use. Natural and artificial weathering tests also represent an important activity. They are used to verify the performance of various materials (wood, plastics, metal) during time.

Fire Reaction Test:

These tests are designed to measure how much one material takes part into the fire to which it is submitted. There is possible to give one of the classes, foreseen by the Italian laws, to the materials such as wood and wooden panels, plastics, fabrics, paints and varnishes or upholstery furniture. CATAS is authorized by home office to issue the test certifications to obtain the home office homologation.

Mechanical Test on Finished Products:

The purpose of the mechanical tests on finished products is to evaluate the safety, strength and durability of chairs, tables, cabinets, beds, mattresses, cots, high chairs, bunk beds, kitchen furniture, moveable partition walls and

screens, ladders, upholstery furniture, outdoor furniture, etc. Another section of this department is dedicated to the tests to check the resistance to wino, to water and opening closing of external blinds and shutters. The performance of the technical aids for persons with disabilities (walking aid manipulating by one or booth arms, hoists for the transfer of disable persons, adjustable beds, wheelchairs) are also verified.

Product Certification:

- Periodic sampling of product in factories by CATAS
- Internal control of the product by the company
- Periodic verification of compliance to the requirements.

Thus certification makes sure that all the production subject to certification satisfies the requirements. While a test report only refers to the sample sent by the company a product certification covers the whole production. Product certification thus reduces the risks due to non-complying products; while simultaneously encouraging improvement of products through monitoring by a qualified institute.

CATAS is able to certify raw materials (raw panels, coating systems), semi-finished products (coated panels and beams), components (domestic furniture surfaces) and furniture (beds and mattresses). The certification activities are chaired by a Certification Committee appointed by CATAS Board of Directors.

Company Name:
FANTONI SPA

Address:
Zona Industriale Rivoli
33010 Osoppo/Udine Italy
Tel. +39 0432 976346
Fax: +39 0432 976546
E mail:info@fantoni.it
Web: www.fantoni.it

Background

Inaugurated in 1996, the Fantoni Research Centre is the driving force behind the Fantoni Group's design strategic and communication activities. An important reference point for ideas in its sector and promoter of intense cultural activities through workshops, conferences and meetings are held in cooperation with numerous personalities from the industrial, design and university worlds. These activities have given rise to a number of already-implemented or ongoing innovations. They are recounted in the "Blue industry" publications, with reports and descriptions of the various projects that round off a 360 research programs.

Fantoni Research Centre

Innovation is "expending the use of renewable materials". A high dependence on other countries for supplies of timber sustainable development and a common agricultural policy aimed at finding alternatives to traditional food crops. These are the factors which encouraged the Fantoni Research Centre to propose to the agricultural industry in our region a project aimed at creating a local source of raw material for producing panels. Regional Forestry Department and Vivai Alsia, a surface area of 30 hectares in the region was planted with the aim of reaching 4,000 within the next 2 years. The tree used was a hybrid poplar (Populus nigra), selected to withstand high planting density and for particularly fast growth. Harvesting is biennial and fully mechanized without removing the root structure. 4-5 harvests are planned for a total duration of cultivation of 8-10 years. The experiments are monitored by the Faculty of Agricultural Science at Udine University.

Wood Recycling Process

Innovation is "giving a value to things others discard". Recycling and eco-sustainability the use of wood discarded by the community (old furniture, floors, doors, window frames etc.) is the most innovative phase in the production of particle board panels. Via an extensive collection network Fantoni recovers around 350,000 tones of wood each year, taking it from dumps and lightening the waste disposal process. The wood collected undergoes various phases of cleaning to separate elements such as iron, aluminum, plastic and silica and to ensure high quality standards for the finished product.

Powder Painting:

Innovation is "simplifying production processes". The powder painting technology, regularly used to colour metal components, has been transferred to the area of wood thanks to research by Fantoni into an MDF panel capable of withstanding this treatment. Metawood, a product 10 times more conductive than other panels yet with the same machine ability qualities, powder painting allows semi manufactures to take on any form, with diversified surface finish and colour solutions also for small production batches. All this is safe and without the emissions caused by the solvents used in traditional finishing processes and eliminating the need for sandpapering.

MDF Applications

Innovation is "making an ordinary object extraordinary". Fantoni has always believed in the extraordinary potential of MDF, a versatile, eco-friendly and competitive material which ahs revolutionized the furniture industry and components for building. Research at Fantoni now aims at extending its performance and uses even further, thanks to special versions such as fire-retardant, water-repellent, lightweight, zero-emission and superconducting MDF. These experiments have further boosted the whole production chain and generated numerous process innovations in the future "Silicon Valley" straddling the provinces of Udine, Pordenone and Treviso, leading to the production of a new generation of doors, plinths and frames.

Environment and Health

The "gas analysis" method enables formaldehyde emissions to be measured in all types of panels, both faced and un-faced. The panel to be tested is placed inside a glass cylinder, in which a controlled air flow is circulated. The air flow, Carrying the formaldehyde and the emission value is thus research by Fantoni and Catas has meant that this equipment can be used to enables very low emissions to be measured fast and effectively and was key to the development of the EO panels-designed specially for the Japanese market-which emit quantities of formaldehyde comparable to that of natural wood.

Company Name:

CERT

Address:

Via Pezza Alta 34
31046 Rustignè di Oderzo (TV)
Tel. +39 0422 852016
Fax +39 0422 852058
E-mail: labpfp@tvtecnologia.it
Web: http://www.cert.tvtecnologia
videoconferenza: +39.0422.852138

Background:

The company has obtained the pre-notification at European level for building products. At the window/door level frames and inner partitions laboratory it is also possible to ask for tests according to the UNI, EN and ISO standards and in collaboration with the Technical Physics Department of Oadua University. C.N.R (Italian National Research Council) and important national and international research laboratories.

At CERT Windows/Doors Frames and Inner Partitions, accredited by Sinai with no. 0170, the following tests can be carried out on windows and doors frames:

Air permeability, water tightness, wind load resistance, calculation of the thermal transmission, acoustic insulation, mechanical tests and burglar resistance; on glasses, inner partitions and room divisors:

Mechanical Tests and Acoustic Insulation

Tests are executed in a laboratory under controlled temperature ranging from 10 to 30°C and humidity ranging from 25 to 75% of RH. The testing reports made by our laboratory are accredited in the following European and non-European countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Ireland, Norway, Holland, Portugal, Spain, Sweden and Switzerland and Australia, Hong Kong, New Zealand, Singapore, South Africa and the two major accreditation bodies in the USA, A2LA and NVLAP. SINAL has signed with the national accreditation organizations of these countries mutual recognition agreements.

Test Performed by the Laboratory:

*UNI EN 1026/01
Windows and doors and air permeability, test method.
*UNI EN 1027/01
Windows and doors and water-tightness test method.
*UNIEN 12211/01
Windows & doors and resistance to wind load, test method.
*BS 6206/81
Flat glasses, impact tests (symmetrical and asymmetrical glasses)
on safety glasses for use in buildings.
*UNI 8201/81
Internal walls housing, soft and hard body, impact tests.
*UNI 8200/81
Internal doors housing, soft body and impact tests.
UNI EN TSO 140-3/97
Acoustics measurement of sound insulation in buildings and of build dings elements. Laboratory measurement of airborne sound insulation of building elements.
UNI ENV 1628/00
Windows, doors, shutters and bang resistance. Test method for the determination of resistance under static loading.

Company Name:
STRATEX SPA

Address:
Sede e stabilimenti
Industria travi lamellari
Via Peschiera 3/5
33020 Sutrio, Udine
Tel +39 0433 778762
Fax +39 0433 778418
E Mail:Info@stratex.it
Web Site: www.stratex.it

Background:

Stratex Spa is one of the leaders in Italy in the glued laminated timber sector; the production management of Stratex has always been characterized by continuous research and quality control, complying rigorously with DIN standards, Stratex has ISO 9001:2000 quality certificate and the class A certificate from the Ottograf Institute of Stuttgart. Actually the company is also certified according to environmental management systems ISO 14001.

Technical Capacities

In its plants of Sutrio (Udine) new equipments work including an advanced machine for manufacturing laminated beams and a completely integrated and automated work centre featuring the most advanced CAD-CAM techniques for finishing products of any shape and size. Thanks to its in-house technical and commercial departments, the company can provides a full range of services from the beginning of the project to the working drawings and calculation reports, the best technical solutions for the design and on-site installation of the structures that Stratex installs.

Company Name:
ENCO Engineering Concrete S. R. L

Address
ENCO Srl
74301
Via delle Industrie, 18/20
31050 Ponzano Vento (TV)
E mail: info@encosrl.it
Web site: www.encosrl.it

Background:

ENCO Engineers Associated was formed in 2004 and work in association with ENCO Engineering Concrete. Both societies work in the field of buildings supporting each other with their respective expertise. ENCO — Engineering concrete is a consultant R&D company with its Material Testing Laboratory founded in 1989 and has a reputation for all building materials and in particular for reinforced concrete structures.

Mario Collepardi, President of ENCO Engineering Concrete, is the author or co-author of more than 300 scientific papers, several books on concrete, and five international patents in the fields of super plasticizing admixtures, silica fume, expansive agents for shrinkage-compensating concretes, and pre-mixed mortars for building repair. ENCO Engineering Concrete (www.encosrl.it) is a member of the Association of High- Qualified Research Bodies according to Art.4 of the law 46/82 of the Ministry of University and Scientific and Technological Research (MURST). It's certified by DNV conforms to the quality management system standard UNI EN ISO 9001:2000.

ENCO Engineering Concrete has a materials laboratory authorized by the Ministry of Public Works with Ministerial Decree number 46263 of 19/05/2000 according to art. 20, law n. 1086 of 1971. It has the following qualifications: IRICAV UNO and CAVET for the study and optimization of materials used in the manufacture of pre-stressed reinforced concrete structures for the Rome Naples lap of the Italian National Railways High Speed Rail Project.

ENCO provides the following activities:

- Tests on cement, aggregates, admixtures, mortars, concretes, steel, bricks, wood, etc.
- Consultant service on the optimization of materials used in new buildings, in the analysis of the state of deteriorating structures and in the selection of materials to be used in structural repair.
- Development of software packages for mix-design and prescriptions for concrete.
- Update-courses and specialist courses on construction materials for technical staff employment in enterprises, management, industries and planning offices.
- Technical consultant in legal disputes.
- Arbitration in disputes between parties (working within construction industries) on a shod timescale (typically 30-60 days) making use of documentary evidence provided by those concerned or made available by further investigation.

ENCO Engineers Associated was founded to answer requirements of static and dynamic analysis of existing structures investigated.

ENCO Engineers Associated (EEA) provides professional services for all building types, and in particular design projects for new building and existing buildings according to the most recently European norms. In particular EEA can make dynamic analysis to investigate the vulnerability of the existing constructions against seismic actions with the support of computer structural analysis design aids and tools including finite element model. Design and drawing is output using CAD facilities. Due to its expertise in the field of building materials, FEA can develop repairing buildings' project with the most modern technique (reinforced wood, fiber reinforced polymer, stainless steel, etc.).

EEA is regularly engaged to undertake surveys and investigations of existing buildings or civil structures and to report upon various specific aspects including building and structural condition, adequacy for proposed use or implications of any proposed structural alteration.

Company Name:
MARCONI SYNTEREDWOOD

Address:
Marconi s.a.s
33050 Lauzacco - Pavia di Udine
Via Palamonova, 29
Tel. 0432/657512-675714
Fax: 0432/675951
E mail: marconit@tin.it

Background:

Plastic wastes are today fundamental issues for those duties that are firmly committed compatible development. And MARCONI has already been 'present and operating in this area for ten years. Ever-increasing public awareness in matters of environmental protection, subsequently translated into direct demand for products that further this cause, gave us the necessary encouragement to proceed with in-depth research, resulting in le creation of SYNTREWOOD YNTREWOOD' is an innovative row material, made en of recycled materials, whose chemical and physical properties make it suitable for a variety of uses. Originally created as a structural base for producing accessories in le furnishing sector and, more specifically, chair seats and back rests for subsequent upholstering, it 'as later successfully applied in the packaging and building sectors, All this naturally taking into account the economic and ecological aspects associated with high-tech processes.

Recovering, Recycling and Processing

So what is unique about SYNTREWOO, at a time when everything is being recycled, from glass to aluminum and from ceramics to a variety of plastic materials?

What the engineers and staff at MARCONI have succeeded in crating is an innovative technological process that is capable of mixing and binding materials which tend to be refractory and which, until now, could not be used in production processes.

Plastic substances that are difficult to amalgamate: plastics taken from differentiated waste recycling con trainers which, by their very nature, accumulate different materials, each with their own physical and chemical

properties and which are hard to identify and separate; inert industrial residues from the washing of plants producing plastic materials; sawdust and wood flour taken from collection silos in the wood industry.

All these are sieved, dried, hot mixed and bound together by means of a process exclusive to and patented by MARCONI. The result is SYNTREW000 a product that looks more like wood than a plastic material, yet adopts the same production processes as the latter, with plants specially designed and built to MARCONI specifications for treating plastics that are heterogeneous and contaminated with other materials such as paper, fabric, wood, etc. The outstanding feature of SYN TREWOOD® is that it combines the best characteristics of wood and of plastic, lends itself to all operations that can be performed on wood, such as milling, turning, drilling, etc. and will take all types of fasteners:

Upholstery clips, self-tapping screws, studs and other. These processes are carried out at MARCONI by computerized robots and mechanical hands which ensure maximum quality and reliability of the product. SYNTREWOOD is water repellent, can be made fireproof by the addition of specific chemical agents, does not contain ureic adhesives or formaldehyde and therefore does not produce toxic vapors as it ages.

Sintered Wood Recycled and Re-used:

The products made of SYNTRE WOOD® which shown in this catalogue have been tested in specialist laboratories and have been found to have mechanical strength and elasticity characteristics superior to those of similar products made of wood. They are clean, ecological and durable.

Famous designers have created objects using SYNTREWOOD®, objects described as eco-compatible', for development that is environmentally-friendly.

It is essential that designers should be ever more committed to creating ranges of consumer products from recycled materials; this will encourage the whole metamorphosis process, being one which seeks to obtain a product from an idea, with a basic assumption that ecology is a primary component to be used in the design.

MARCONI is ready to study new applications, prepare your designs and accept advice and new input for mutual improvement.

Company Name:
FASSA BORTOLO

Address:
Via Lazzaris, 3-31027
Spresiano (Treviso) Italia
Tel: +39-04227222
Fax: +39-0422887509
E mail: fassa@fassabortolo.it
Web: http://www.fassabortolo.it

Background

Fassa has a technologically advanced laboratory offering designers and building operators the value of research and material analysis, which are fundamental activities for creating ,innovative and winning products. The wide range of devices and instruments available for X-ray fluorescence and diffraction, electron microscopy laser granulometry and so on, enables to analyses the material at a microscopic level and evaluate its chemical and physical characteristics in order to select formulations, which best guarantee the quality of the products. The reliability of the materials over time is ensured by special rapid ageing tests, which simulate the most varied environmental conditions and can predict how the products will react. It/s innovative, practical, efficacious and very reliable compared with the product traditionally supplied in bags. This system, used in Italy in the sector of premixed p/asters for the first time by FASSA, is nowadays employed to supply other products, such as mortars for walls and self-leveling floor screeds. This is an excellent solution that does not require labour for unloading the material when it arrives on site, or later to feed the mixer; the plaster is transported directly to the point of application and can be applied continuously without dust; the powder product remains dry and stable; it also ensures a cleaner site since there are no bags or packing of any kind.

A complete range for the building industry

Constant concern for maximum quality guaranteed by rigorous controls throughout the production phase, and the efficiency of a rapid, professional service makes FASSA an expert and reliable partner in any kind of construction or renovation work. Always up-to-date with the evolution of the market, FASSA satisfies widely different operative needs, from the smallest to the largest building site, with is vast array of production ranging from pre-mixed coloured plasters, mortar for brickwork and wall to solutions for restoration, renovation of concrete and thermal insulation. In addition there is a complete line of certified bio-ecological products for building and restoring with natural criteria, according to the canons of the latest bio -architecture.

A Structure in the Forefront of Technology

A guarantee of satisfaction for the customer; the total automation of all the sectors in the paint factory means that the operators can be wholly dedicated to quality control of the production process. In addition, unlike traditional plants where colouring is given to the entire mass of plaster; colouring tin by tin with an industrial colour meter allows the m quantity of an order to be as little as a single tin; respecting the homogeneity of the colour within a single lot, the production cycle proves to be extremely flexible and competitive.

Advanced Technology

From the extraction of the raw materials to the finished product, the production unit at Mazzano, in the Province of Brescia, is the fruit of all the know-how acquired over the years by Fassa 's technicians in the sector of pre mixed plasters and dry mortars. The result is a modern plant with completely computerized control of the production processes and stocking with a daily production of 1,500 tonnes of lime based premixed plasters; this factory is able to offer an unequalled range of products and services to the building industry in Lombardy.

Future Technology

Created in the year 2000, this plant is character by a double line for mixing that guarantees maximum flexibility and allows the possibility of producing different products at the same time. Its geographical position, which is something unique among FASSA's plants, is certainly an important starting point for a medium to long term strategy which foresees the possibility of exploiting means of transport and distribution systems that are not conventionally associated with this type of product.

A Unique Plant of its Type

The factory in Moncalvo, in the province of Asti, has been operative since May 2000 and is the first FASSA plant for gypsum based products with a complete productive cycle, from the underground extraction of high quality gypsum to the modern, highly automated plant using rotating kilns for firing and refining. The result is a unit capable of producing over 800 tonnes of gypsum based products daily with a high quality- productivity ratio and which, above all, pays special attention to the problems of environmental compatibility.

Company Name:
ROSE

Address:
Via Parma, 2-35010
Perarolo di Vigonza (PD)
Tel: +39-049-8097504
Fax: +39-049-8097308
Web: www.bugnoluciano.it

Background:

To create a facility for recovery-rehablitation-reuse and recycling of debries originated from the demoloshion of civil infrastructure and builsings caused either by re-urbanization program or by natural disasater as earth-qucakes.

Process deatils:

The approach has been concieve on integrated system made wiht recoeverd and re-processed debris which have been sized, seived, and selected at the "core system" of the platform.

The production of the core system can be taylored to provide inert "sand" and "gravel" sized from 1 to 70 mm according to the requirments for road construction and ready mix concrete. In order to expand the productivity of the platform unit have been considered. Depending upon the local avialbitlity and traditional building habits, the plateform could recover fired clay products to be crushed and blended wiht natural raw materails and produce stablized earthblocks.

Future Plan:

The plant is planned to become a:

- "Training Centre" of manpower for construction and maintanence of plant equipment and vehicles.
- "Vocational School" for masons, concrete tecnologistes and people trained in materails eveluation and control.
- An outlet market place and reuse compartment to favour local craftman, materails delaers and to encourage the start-up of small and medium enterprises.

8. Outcome of the visit

Area Science Park

The program started with the visit of Area Science Park, Trieste. Ms. Gabriele Gatti, Director, Marketing and International Relation explained briefly about the activities of the Area Science Park. She explained various possibilities to the Indian entrepreneurs to enhance the marketing opportunities of their companies by getting registered with the Science Park. M/S S K Formulations, Bombay discussed about the possibilities of introducing innovative paint and coating developed by their company in Italian market. Mr Nikhil Jain, door manufacturer from Delhi also showed his keen interest to use the Area Science Park facilities to enter into some joint venture with the Italian companies. Dr Amit Rai, Development Officer and Delegation Coordinator and Mr N. Jayachandran, Deputy Director, Ministry of Housing and Urban Poverty Alleviation, GOI and Delegation Manager along with Prof. Sergio Meriani, Consultant, ICS, Trieste emphasized on exploring the possibilities for joint programs with Area Science Park for future cooperation between the building industries of both the countries. Few copies of the Delegation Directory were left with the concerned officer for further dissemination of the information about the Delegation.

International Centre of Science and High Technology

At ICS the delegation members were introduced to the Dr Guisto Sciarraba, Managing Director, ICS and Dr Graziano Bertogli, Head, New Materials. Managing Director, ICS discussed about the long standing relation between BMTPC, ICS and ICAMT-UNIDO and briefed the delegation about the proposed activities between the two countries as well as the possibilities of joint programs in other developing countries. Mr. Bertogli talked about the various initiatives taken by the ICS in the area of new materials and possibilities for Indian building materials manufactures for participation in proposed activities. He discussed about the project on mini cement plant in African countries and asked for Indian participation in this project.

Mr. Sunil Aggrawal, CEO, In-global Resources took the initiative to come out with feasibility reports from established cement companies in India for this project. Deputy Managing Director, ICS has requested for BMTPC & UNIDO participation in implementation of this project. Dr Amit Rai, Development Officer, BMTPC talked about the mini cement plant technologies developed in India at research laboratories and possibilities of a joint project for transfer of these technologies with the support ICAMT-UNIDO.

CATAS SPA (Research and testing centre for MDF/HDF board)

At CATAS spa, testing and research laboratory the delegation members were welcomed by the Dr Angelo, Director and CEO of the company. Mr. Angelo provided a broad view of the company with the presentation about the various testing facilities and the certification producers of the company for various types of medium and high density fibre boards. Delegation members inquired about the possibilities of certification of Indian products from the laboratory and chances of increasing the marketing aspects having the certificate from the company. Dr Angelo showed the three important sections of the company viz. a complete mechanized testing centre for various kinds of boards, other section for chemical and adhesive test for glues used for the production of the boards and a testing laboratory having all important tests as per the European Standards used for providing certification to the companies. He also informed the delegation that at present there are about eleven hundred manufacturing units registered with the company for certification. He expressed his willingness for collaborative work with the Indian companies for certification and standardization of products and technologies.

FANTONI SPA (Plantation timber based board manufacturing unit)

During the visit of the Fantoni spa, the delegation members interacted with the Mr. Andrea Cleani, Export Director and Ms. Elisabetta Pascolo, External Relations Manager, of the company. Both the executives explained the various divisions of the company and talked about the marketing aspects

especially in Indian and Asian market of the products manufactured by the company. This company is the third largest plantation timber based board producing company in Italy. Both the officers of the company showed the delegation the manufacturing process and plant & machinery. The discussion was focused mainly of increasing the marketing opportunities of the company in India with the active participation of the delegation members. Mr Hardik Panchel, Rushil Decor discussed about the long term understanding between Fantoni and Rushil Décor for having Fantoni HDF board for their upcoming door manufacturing plant in Ahemdabad, India. Other participants also inquired the possibilities for some promotional rights of the company to market their product in India.

CERT (Centre for door and window frame certification)

CERT is one of the important centres for testing of the wooden door and window frame in the Treviso industrial area. Mr Alessandro Cibin, Director of the centre explained the working of the centre for the certification of wooden framed door and window. He took the delegation to all the testing facilities and discussed/explained the various important aspects of this special type of product, which is more useful in the cold climate of European region. Delegation members took keen interest and tried to explore the possibilities for export of wood for manufacturing of this special kind of door shutters and window in Italy, since the cost of the wood is quite high as compare to India and other Asian countries.

STRATEX SPA (Roofing solutions with finger jointing technology)

Startex spa is the company having large manufacturing unit for the wooden roofing solutions for stadiums, auditoriums and school buildings using figure jointing technology. Dr Angela Maffione, Director, Startex explained the various technologies involved for the manufacturing of the different types of roofing elements. Delegation members discussed the technology, which is available in India only for the door and window frame manufacturing. The possibilities of adopting this technology in the same units of door shutter with the addition of few more machinery for production of wooden roof for the hilly and cold regions in India has also come up during the discussions.

Company's executive expressed their willingness to provide the technical know how for up-gradation of Indian technologies, so that more diversified products can be manufactured using figure jointing technology.

ENCO S. R. L (Research and development in cement/concrete laboratory)

ENCO SRL is one of the oldest privately managed research laboratory in the area of cement and concrete products. Dr Ms. Selvia, Director of the laboratory explained the different areas of the research laboratory. This laboratory has got the expertise of the various technologies for fly ash utilization including the high performance and high volume fly ash products. Director also discussed the training programs conducted by the laboratory with the other international organizations. All the participants showed keen interest in the various testing facilities of the laboratory. Mr Sandeep Dave, Director Marketing, Neptue Engineering Company and Mr Nilesh, CEO, Sahjanand Company discussed various aspects of the fly ash based products to improve the quality of the final products. Delegation members also inquired about solution to indicate the mix design using software developed by the laboratory to improve the quality of the end product. Dr. Ms. Selvia, has expressed willingness to organize training programs and seminars jointly with the Council in India.

MARCONI SYNTEREDWOOD (Recycled Plastics Board)

Visit to Marconi Syntered Wood Plant, recycling polyethylene bags for production of different kind of panels and boards for building applications was one of the most focused visits from new technology point of view. This pilot plant facility is using only the waste plastic materials and converting it into the granules for production of various types of planes. The same unit is also being used for producing the various other panels and board for building applications. The whole delegation showed a keen interest for adoption of this technology in India. Mr. Giancarlo Garzitto, Director of the company also expressed his willingness to set up a joint venture in India. Participants also talked about the marketing rights for promotion of this technology in India. The participants also inquired about the cost of the recycled granules so that it

can be marketed in India. This technology has got lot of potential and Council along with the support of Ministry of Environment and Forest and ICAMT-UNIDO may like to create a platform for adoption in India.

FASSA BORTOLO (Producing paint, coating and admixtures)

Fassa Bortolo is a group of companies having large number of units for production of paints, pigments, gypsum, lime and cementities binders. Mr Bungo Luciano, Director of the company gave the over all presentation and explained the working of the company. He also discussed the details of the research centre including the units for the producing different kind of building materials. The delegation members got the chance to visit the testing laboratory of the company and see the two units which were located in the premises of the company for producing paint and ready mix mortar for production of different kind of building materials on sit. The visit provided the chance to delegation to understand the various quality control steps and process for large scale mechanized production of these kinds of building materials.

ROSE (Construction and demolishion waste recycling unit)

The visit to the ROSE, constrcution and demolsihion waste recycling plant was the main highlight of this visit. This visit to ROSE plant was kept on the last day and almost full day was devoted on the site with the technology inventor, plant machinery manufactuere and plant owner to explain the technology to the delegation members. Mr Elio Menzine, Mayor of the Podova Province, Italy was also present at ROSE plant to welcome and discuss with the delegation about the possibilities for propagation and transfer of the ROSE technology in India. Mayor insured the cooperation from government side to support any joint effort by the industrialist of the two countries for adoption of this technology. The delegation members from Gujarat, India which was severely affected few years back due to earth quake found the technology very useful in their state. It was felt that this technology could be best utilized for setting up a plant and machinery in the Bhuj area at Gujarat, still having large number of unutilized debris of the last earth quake. Council's

and Ministries representatives also expressed the willing ness and support for any effort in this direction.

The visit ended with a closer meeting with Prof. Sergio Meriani, Consultant, ICS, Trieste, Italy. Prof. Meriani expressed all support and cooperation form ICS-UNIDO for any further follows up action of this delegation. Delegation Coordinator, Dr Amit Rai, Development Officer, BMTPC and Mr N Jayachadran, Deputy Director, Ministry of Housing and Urban Poverty Alleviation & Manager of delegation also thanked all the participants and expressed support and willingness of BMTPC and ICAMT-UNIDO and Ministry to strengthen collaboration between the building materials industry of both the countries.

9 Follow-up actions:

- Success of the delegation emphasized on the importance of technical delegations between developing and developed countries and need to organize similar programs with other developed countries.

- Active interaction with the industrial association of Treviso Province is required since they are planning to organize a delegation of Treviso industrial area to India in middle of 2007.

- Immediate action for technical as well as administrative support for transfer of technology related to the Debris Recycling Plants (ROSE) since both the side have showed a keen interest for transfer and adoption of this technology.

- Technical tie-ups between the interested entrepreneurs of both the countries for adoption of Plastic Waste Recycling Technology (SYNTERWOOD) in India with necessary modifications in plant and machinery to suits Indian industry.

- Organization of international seminars/conferences in India with special focus on the technology presentation through participation of up-coming technology providers from developed countries in order to provide them a chance to explain the products/technologies in details.

10. Comments and conclusion:

The technical delegation and program was organized as per planned schedule with the active technical and administrative guidance/support of BMTPC and ICAMT-UNIDO. Large numbers of industries have approached the organizer for participation and only short listed industries were invited to join the delegation. Selection was done keeping in mind to have a group representing fairly large and diversified building materials and housing technologies from India. At the same time the industrial visits in Italy were selected to provide information about advanced technologies in Italy and industries having more focused approach towards the waste management and energy saving through recycling of materials were covered. Delegation members got the chance to interact with experienced researcher, consultants, technologies providers, standardization agencies and industrial associations actively working in the area of building materials.

Delegation members showed a great interest in the whole program and thanked the organizers for providing them a chance to join the delegation. Most of the entrepreneurs showed their willingness to participate in such delegation in future also and requested BMTPC and ICAMT-UNIDO to play an active role for transfer of the identified building materials technologies in India.

Annexure – I

Photographic view of the Visits to various industries

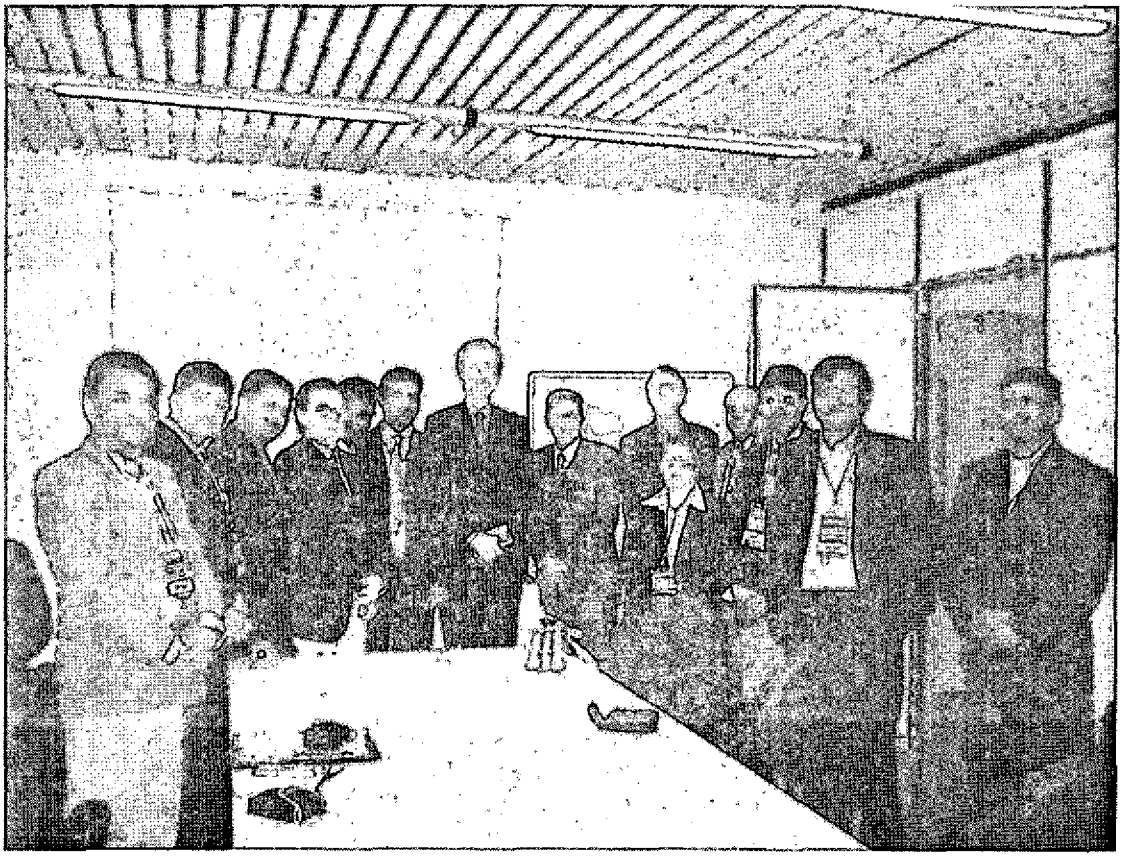
Annexure – II

Pre-visit Participation Form

Annexure – III

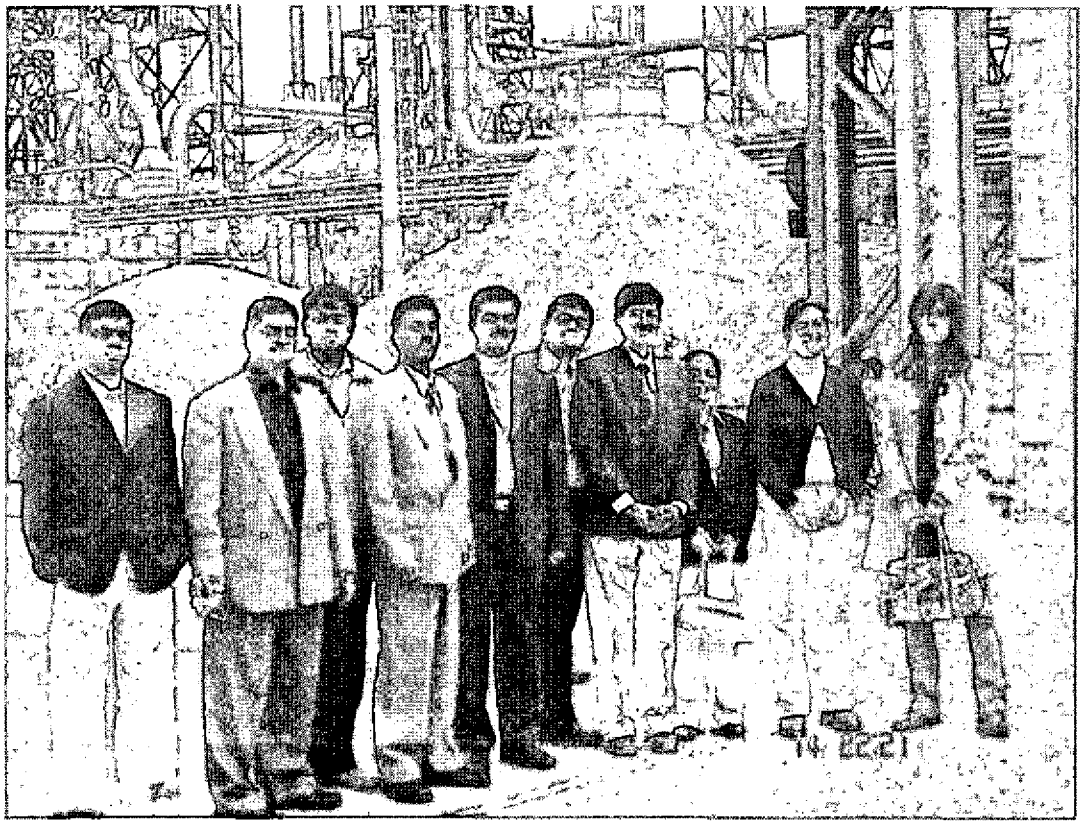
Post-visit Feedback Form

Delegation at Area Science Park, Trieste, Italy



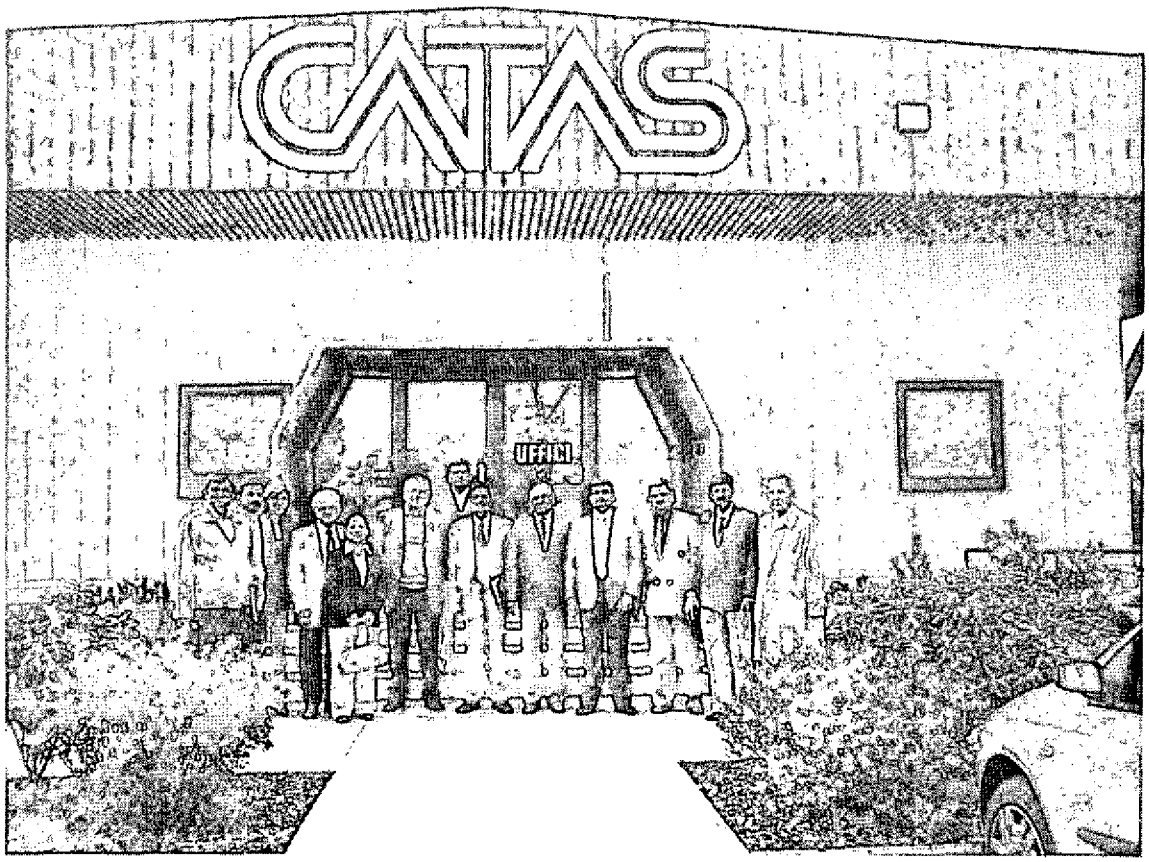
Meeting with Managing Director of International Centre of Science and High Technology

Discussion with Deputy Managing Director of ICS and other consultants

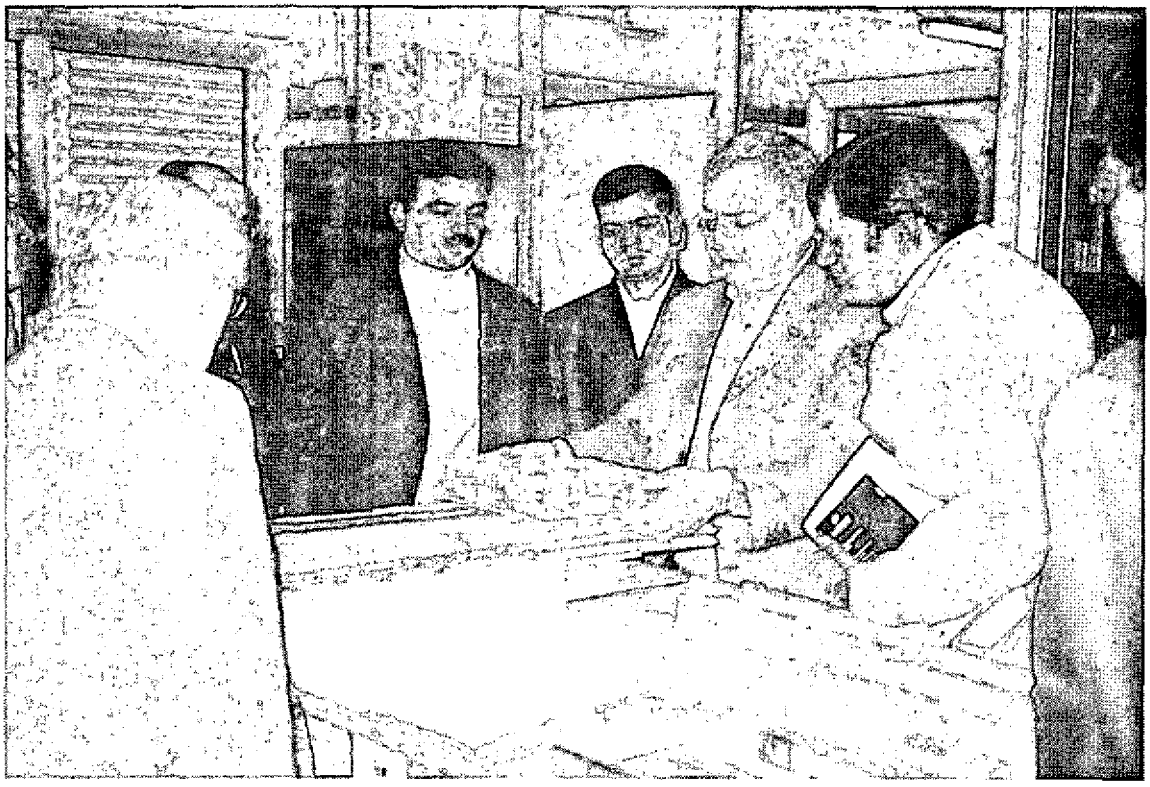


Visit at Fantoni, producing MDF board from plantation timber

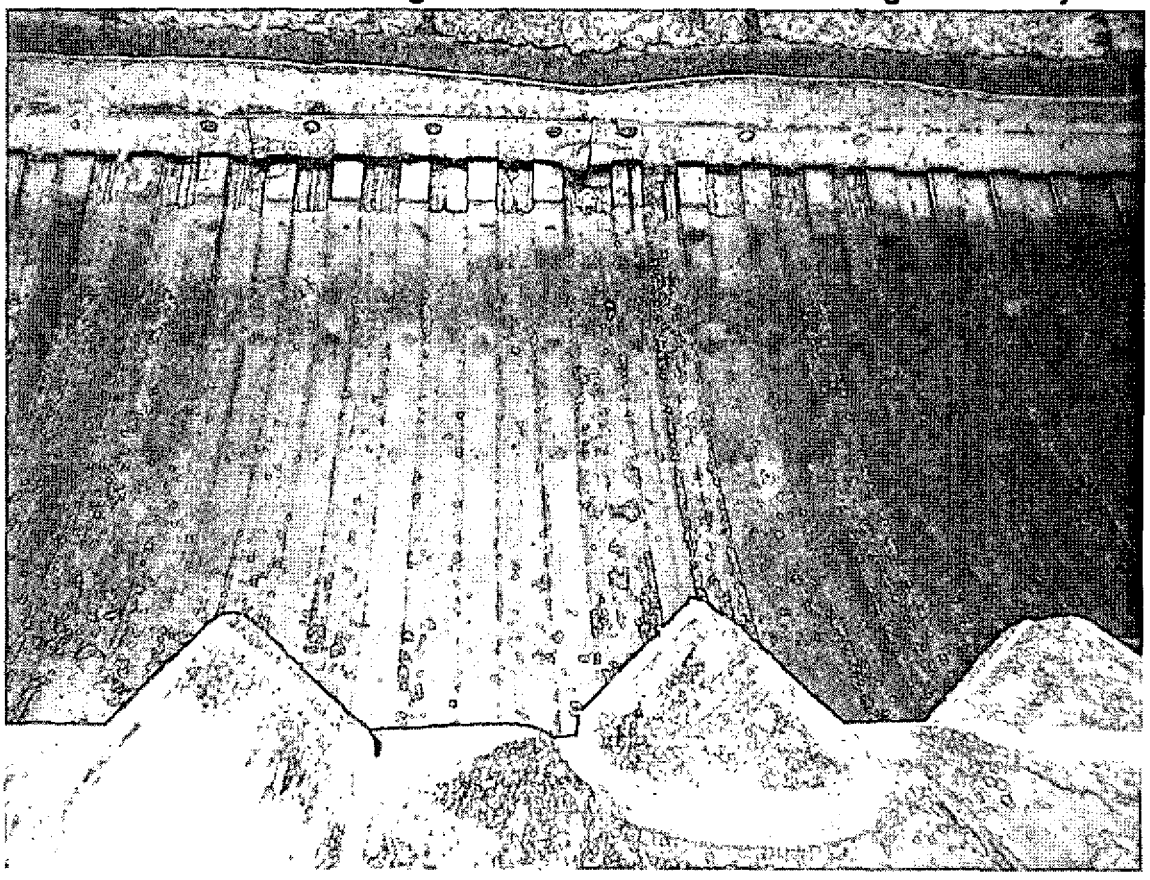
Display Centre at Fantoni with products using MDF board



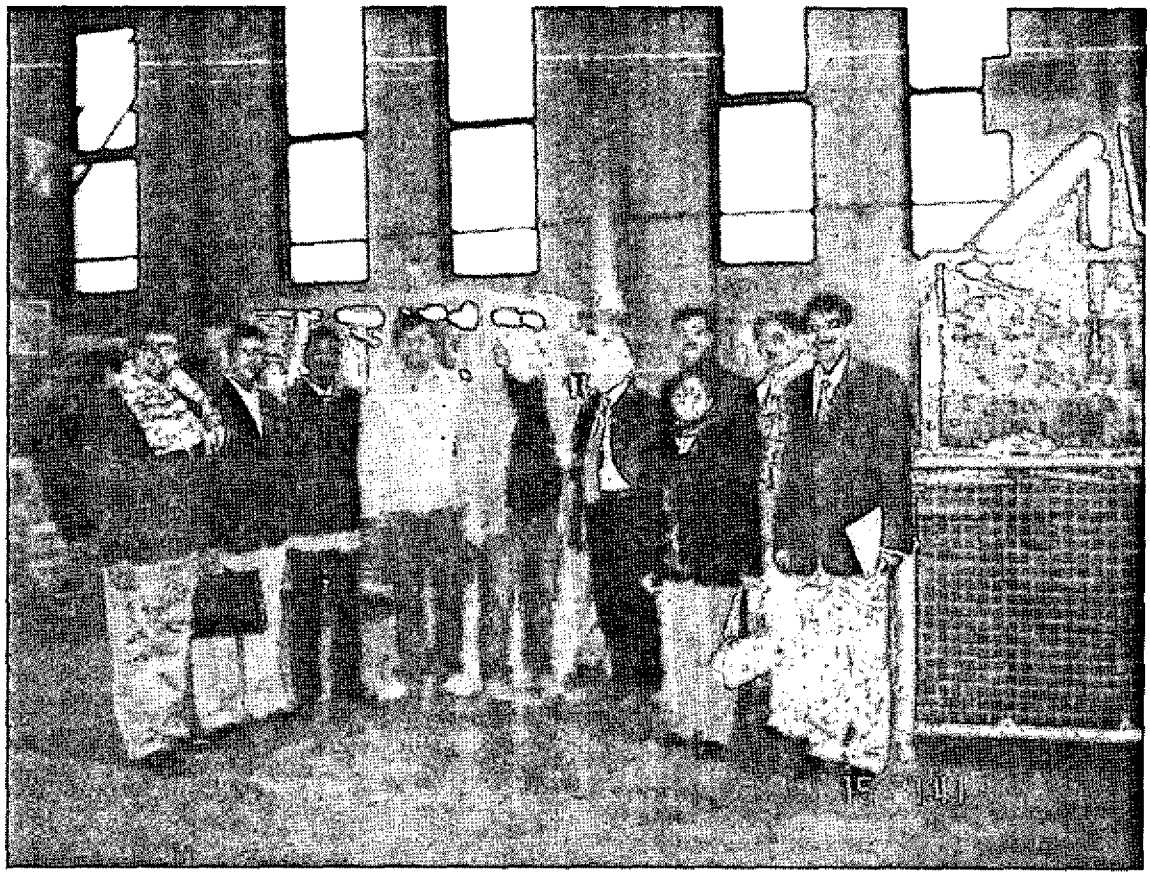
Visit to CATAS Research, Development and Certification Centre



Discussions during visit at CATAS Product Testing Laboratory



Plastic waste recycling process at MARCONI



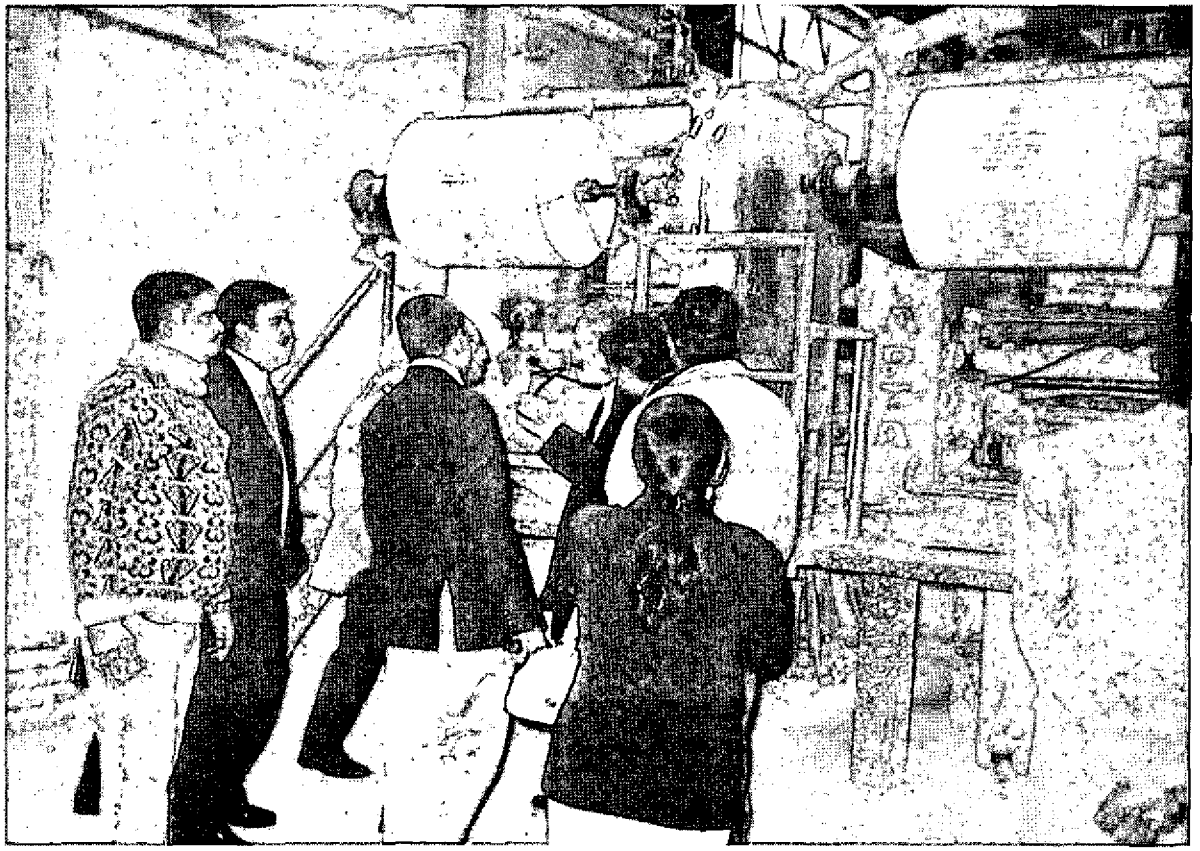
Delegation at MARCONI, recycling plastic waste for producing panels

Visit at Stratex Company producing finger jointed roofing products

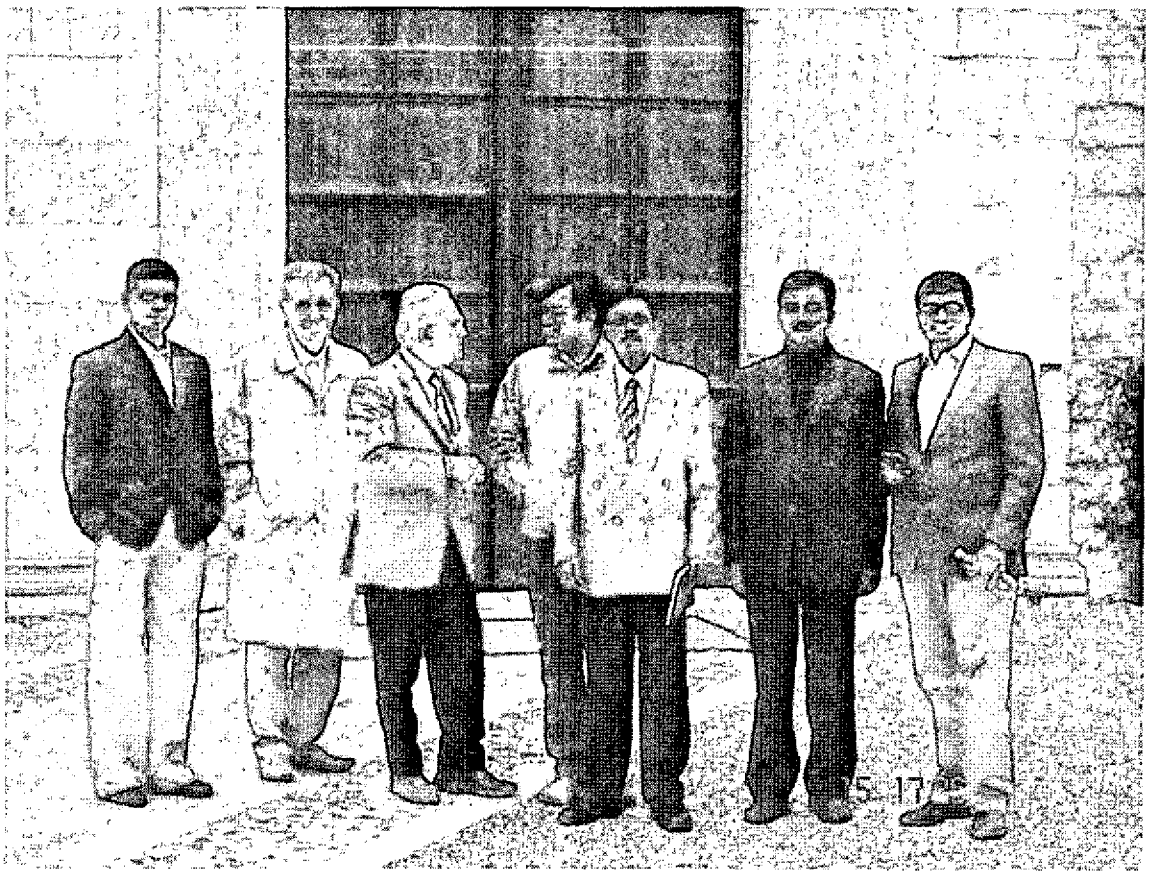
Discussion at Fassa Bortolo Company's Testing Centre

Visits to Fassa Bortolo Plant producing gypsum based coatings

Delegation at Fassa Bortolo paint producing unit

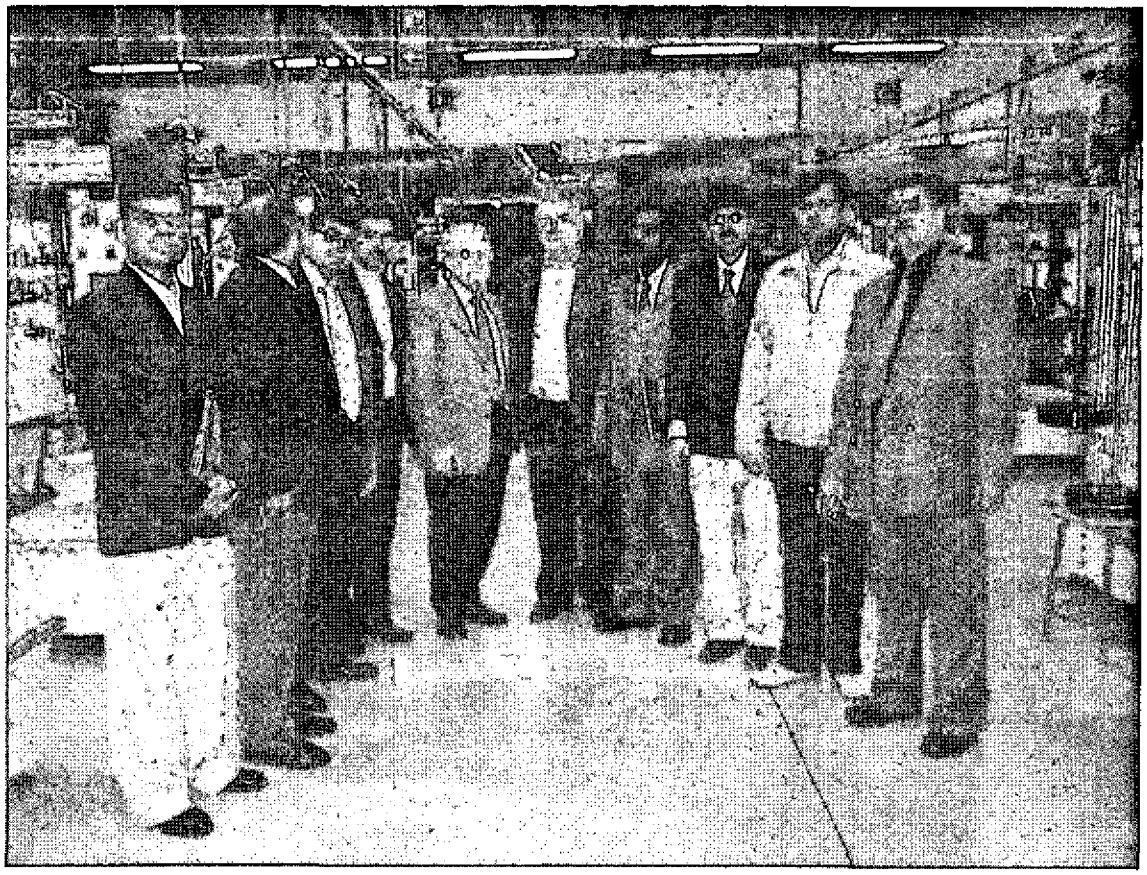


Delegation members with Chief Executive Officer of Fassa Bortolo

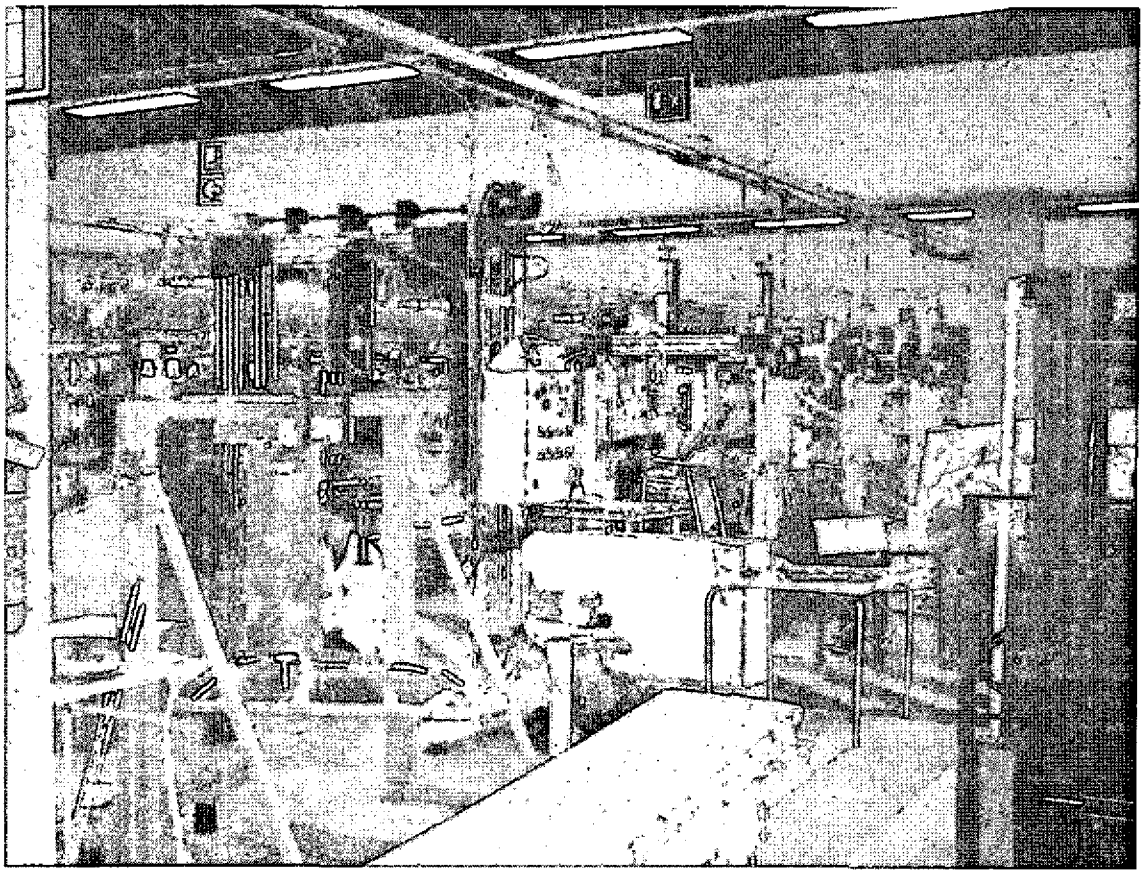


Visit to town rehabilitated after earthquake

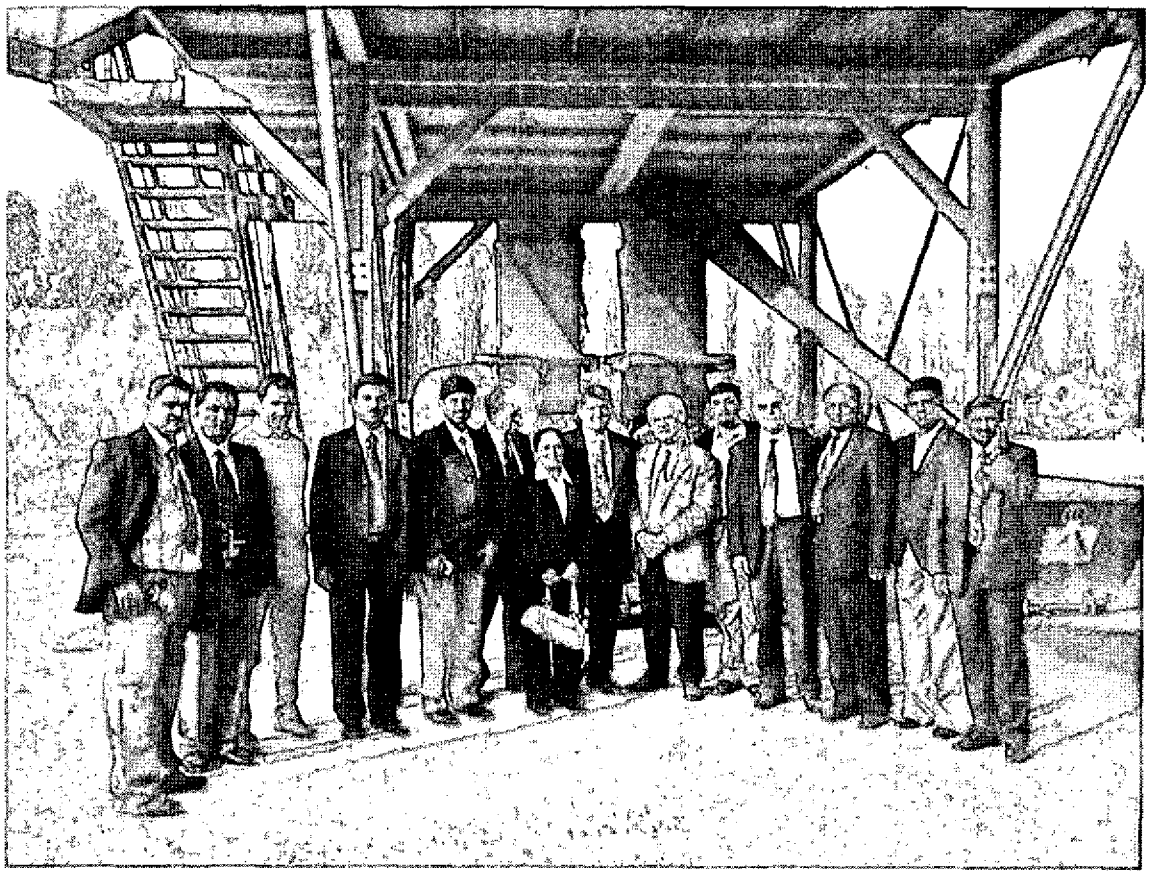
Church building rehabilitated after the earthquake



Testing Laboratory at CATAS for MDF board

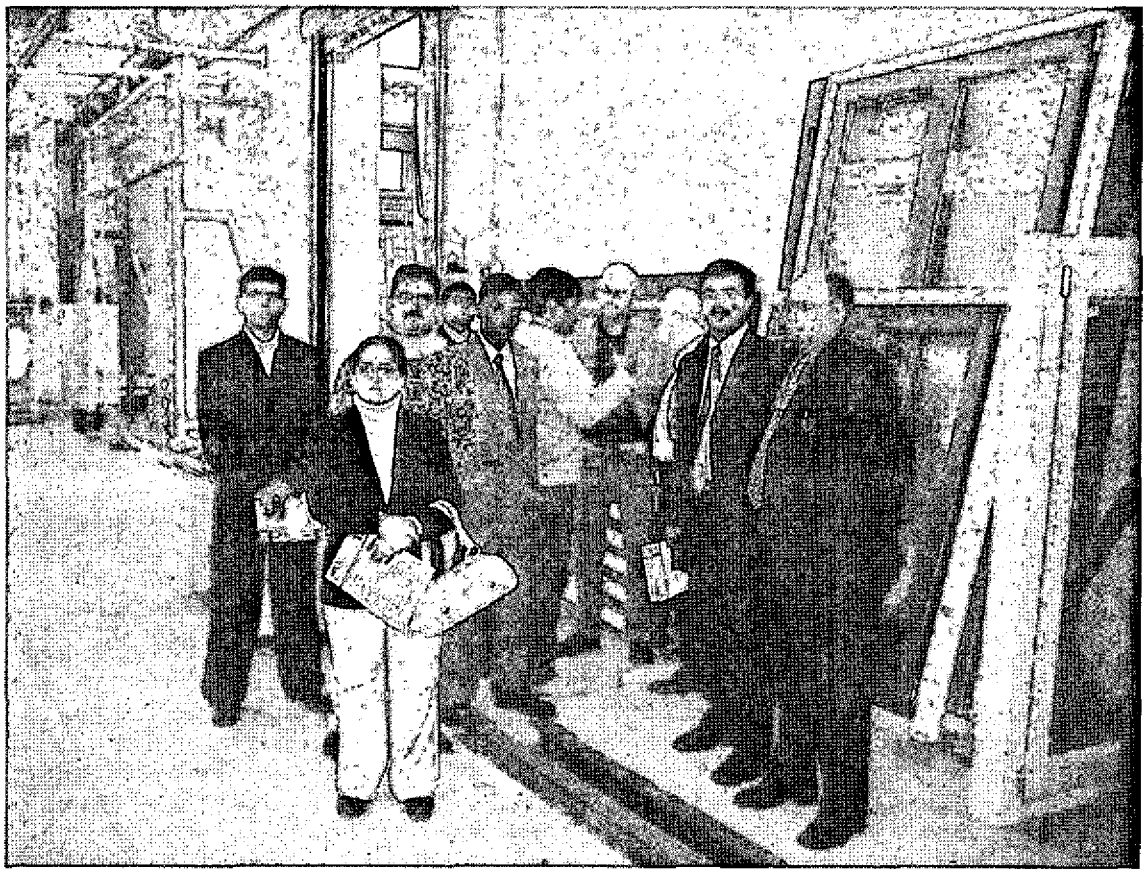


Various other product testing facilities at CATAS

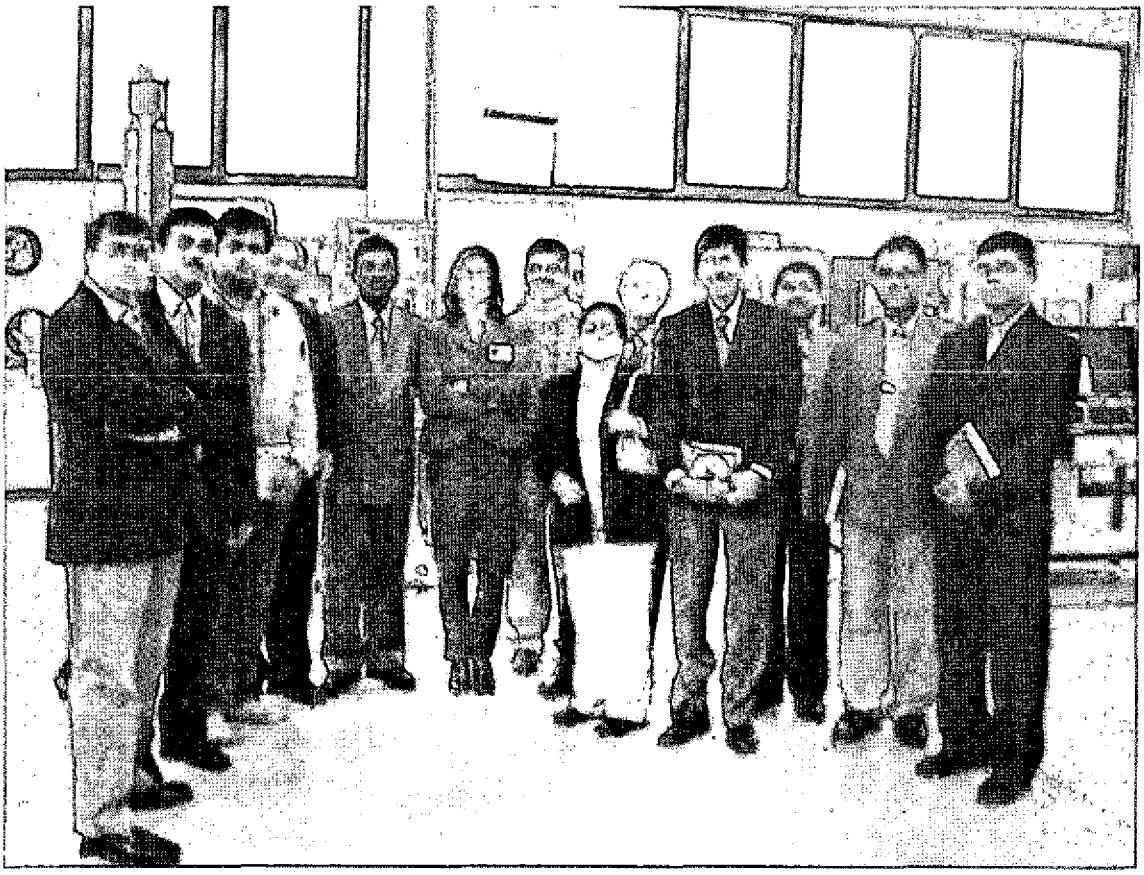


Delegation with technology inventors at ROSE Plant

Delegation at CERT, Organization working for door and window certification



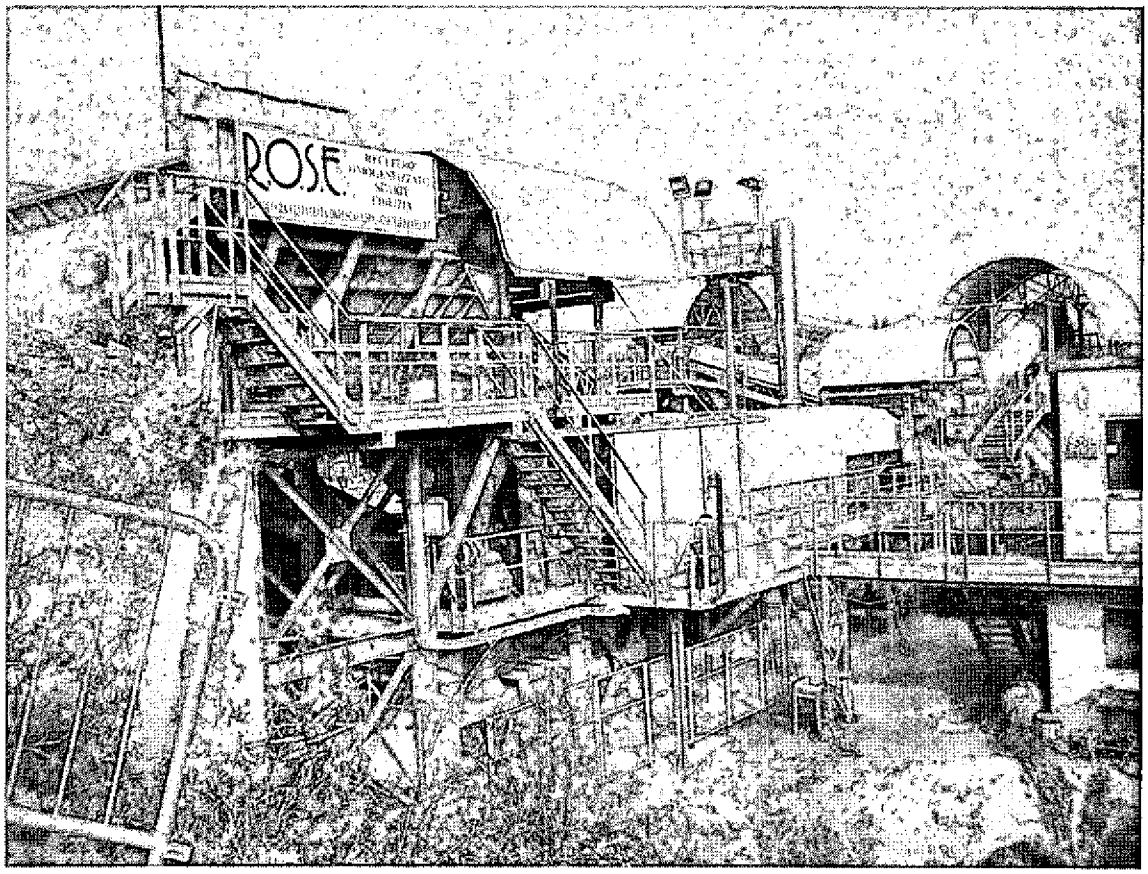
Discussions at CERT Testing Centre for doors and window frame



Delegation during the visit of ENCO Engineering Company

Discussion with Director of ENCO Engineering Company

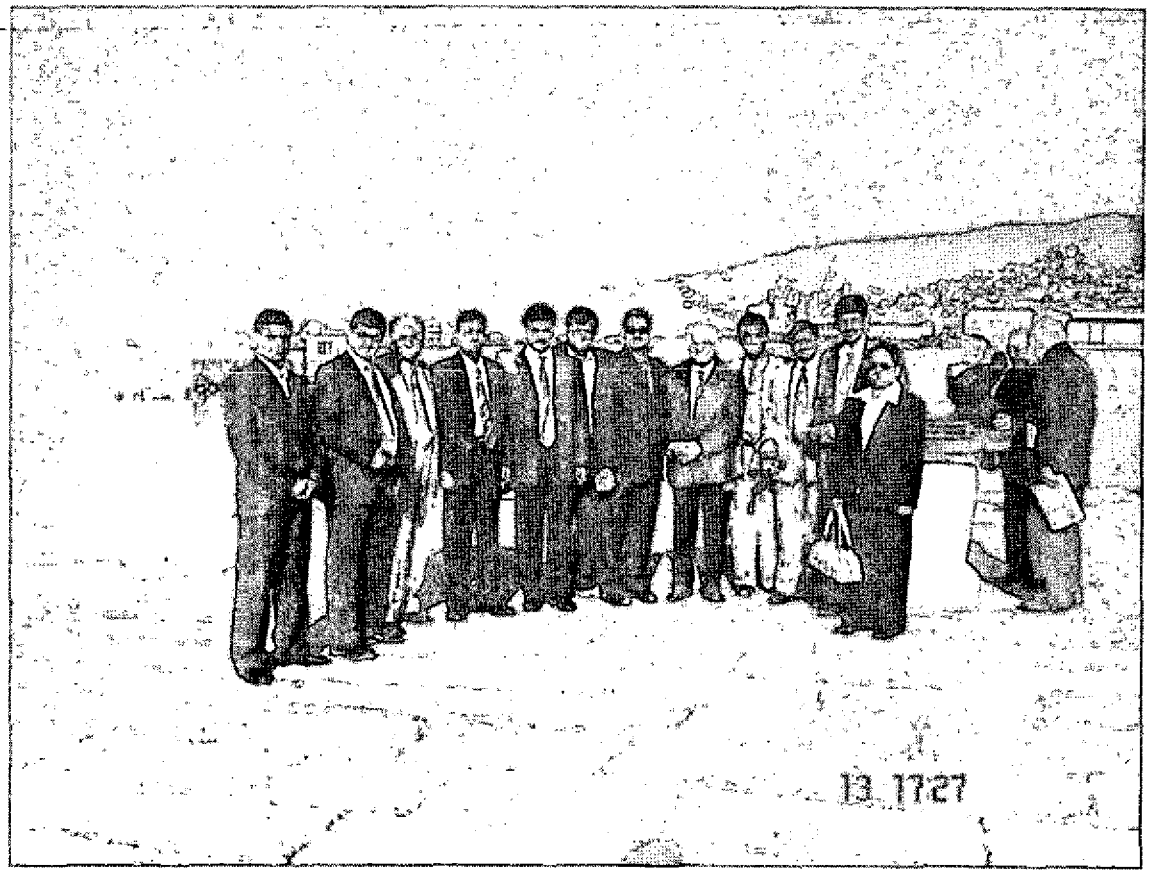
Construction and demolition waste at ROSE recycling plant



Plant for recycling and reuse of the construction and demolition waste

Technical discussion about the various steps for debris recycling plant

Delegation with the Mayor of Podova province at Debris recycling plant



Delegation during the site visit