



TOGETHER
for a sustainable future

OCCASION

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



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

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

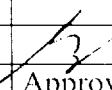
For more information about UNIDO, please visit us at www.unido.org

222/3

Cannon polyuretane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

DRAFT FINAL REPORT

RETROFITTING OF THE REFRIGERATOR
 CABINET AND DOOR FOAMING PLANTS
 FOR THE REPLACEMENT OF CFC WITH
 CYCLOPENTANE AS BLOWING AGENT

D			1		
C					
B					
A	26/04/99	FIRST ISSUE	M. BARALE		
Rev.	Date	Description	Prepared	Controll.	Approv.

Cannon polyuretane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

11. INTRODUCTION

With the present document the Contractor wants to describe the works performed at the plant site for the conversion of the Middle East Company factories to phase out the use of CFC in the production of Domestic Refrigerators

Here below it is briefly summarised the activities performed under the Contract step by step according to The terms of Reference

Cannon polyurethane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

2. LAY OUT OF THE PLANT /REDISIGN OF EXISTING

After the award of the order the Contractor visited the Counterpart between May 10th and 11th 1997 in order to verify the conditions of the site and to identify the best engineering solutions for the conversion of the existing foaming lines.

During the visit, the Contractor discussed and checked with the Counterpart the following main subjects:

A - Technical details regarding the supply of the equipment; in particular The Contractor emphasised the Premix Unit, the Polyol Module, Safeties of the plant (as i.e.: gas sensors, exhaust system with fan groups), cyclopentane storage tank and relevant accessories .

B - The suitable site where the new equipment had to be installed and the required modification to the new layout.

Regarding the C5 storage tank, The Contractor inspected and defined the area where it had to be positioned.

After the visit the Contractor prepared the first progress report including the preliminary lay-out and the Basic requirements and specifications for the site Preparation.

The first progress report covered all the subjects listed during the discussion and gave to the Counterpart, as much as detailed as possible at that phase of the project, a list of all the works and materials to be provided by them.

Cannon polyurethane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

3 REDISIGN OF EXISTING EQUIPMENT/ AWARD OF SUBCONTRACT FOR MODIFICATION OF THE PLANT

In October 1997 the Contractor provided the Final Technical Documentation for the Conversion of the plant.

The above mentioned documentation included the following kind of detailed drawings and specifications:

- civil works for the storage tank and foaming lines
- grounding of the equipment
- piping arrangements and support details
- piping sketches
- box buildings construction
- ventilation construction
- cable run lay-out
- gas sensor positioning
- electrical drawings
- safety requirements

All the documentation was discussed with the Counterpart and some modifications have been agreed during the next period.

Cannon polyuretane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

4. DELIVERY OF EQUIPMENT/INSTALLATION

In December 1997 all the new equipment have been shipped.

A team of engineers attended the training at Contractor site (abroad)

The installation started in May1998 , after the customs clearancce of all the equipment.

The Contractor engineers followed the installation phase with the supervision of the job at Counterpart charge.

The Contractor's actions basically concerned the following zone of the modified plant:

- Cyclopentane storage tank area
- Wet area
- Process fluid connection piping between wet and dry areas
- Cabinets /doors foaming areas

The installation phase was completed in July 1998

Cannon polyurethane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

5. COMMISSIONING. TRIAL PRODUCTION OF THE FIRST MODELS, TEST RUN OF PRODUCTION

After the installation phase the Contractor performed the Commissioning phase of the modified plant in accordance with the contract.

In November 1998 the commissioning phase has been completed.

The training on the job activities has been carried out during the commissioning phase

The commissioning , trial production and test run phases mainly concerned the following operations:

- Pneumatic and Electric circuit check
- Grounding check
- Flushing of the tanks and the piping with nitrogen
- Pressure test
- Check of the operating sequences
- Operating test
- Service simulation test
- Setting start-up parameters
- Foaming quality check
- Performance test

The training on the job activities has been carried out during the commissioning phase.

Cannon polyuretane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

6. SAFETY CERTIFICATION

The safety inspection has been performed in July and October 1998 by TUV ULM .

Enclosed please find the TUV final report and the TUV safety certificate.

Cannon polyurethane technology	DOC N.	CR98/103
	Object	Phasing out of CFC's at MEE
	Contract	UNIDO N. 97/097

7. STARTING MASS PRODUCTION

After the commissioning phase the Contractor performed the starting of the mass production in November 1998.

On our next visit (foreseen in May 1999) we will monitor the performance of the whole plant installation.