



**TOGETHER**  
*for a sustainable future*

## OCCASION

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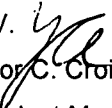
Sankt Augustin  
2002-12-20



Subject: Final Report, to contract 2001 / 151 our reference A 0100-1023

**FINAL REPORT PHASING OUT CFC-11 IN THE MANUFACTURING OF  
FLEXIBLE PU-SLABSTOCK FOAM THROUGH THE USE OF CO2 BLOWING  
TECHNOLOGY AT SAFOAM CO.**

Prepared by:

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Igor C. Croiset  
Project Manager

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1. INTRODUCTION

The equipment was shipped end of December 2001 and arrived in Iran in January 2002.

The actual installation of the NovaFlex® CO2 block equipment started in October 2002 due to the fact that the customer has not installed the CO2 tank.

Some changes have been applied to the original installation plan but in full agreement with Hennecke and the client Safoam Co..

2. INSTALLATION

The installation has been performed by a mechanical and electrical specialised personnel of Hennecke.

Safoam Co. had already placed the CO2 tank before our arrival and the installation has been performed according to plan.

The total installation time took 3 weeks for the mechanical parts and 1 week for the electrical connections.

### 3. DRY RUN

After the installation of the mechanical and electrical connections a process engineer has performed the dry run start up and commissioning with the support of a software engineer for quick troubleshooting.

The dry run is performed with all the raw materials loaded whereby the pumps are tested for:

- Leakage
- Pressure output and stability
- Calibration of the pumps and flowmeters
- Electrical and software test

No problems incurred during the dry run testing, the time required was app. 5 days.

### 4. START-UP and COMMISSIONING

The commissioning with good foam produced has been completed on the 27 of November 2002. The total time our Process engineer followed the foaming was app. 2 weeks whereby he also provided the training in use of the machine, maintenance etc.

We have produced several grades of foam with the following density:

15 and 18 kg/m<sup>3</sup>

whereby the total output of the machine was app. 180 kg/min.

Furthermore, we have produced with our equipment foam densities of app. 25 and 30 kg/m<sup>3</sup>. These foam do not require CFC or LCD but are part of the normal production of Safoam and required for their sales.

The length of runs for the several densities was app. 1 hour.

Due to the fact that during the Dry-Run we had already tested all the equipment, Safoam Co. provided the right raw materials and we had the formulations no problems with regard to the foam quality occurred.

Further to the problem which will incur when changing the raw materials from the ones proposed by us. For the future they will seek advice from us and from the raw material suppliers in order to enhance their product palette.

We believe, as also stated by Safoam Co., that the conversion to CO<sub>2</sub> has been very well accepted also because the working environment has improved substantially. During their previous production with CFC the exhaust gasses reached unbearable levels. For this environmental benefit Safoam Co. should be very grateful to UNIDO for implementing LCD and not MC conversion.

#### 5. EXISTING EQUIPMENT DISMANTLING

The existing metering units have been dismantled and removed. Furthermore, our equipment does not contain pumps with which CFC can be used and being high pressure units the existing low pressure CFC pump cannot be used, this pump has been in any case dismantled.

#### 6. RECOMMENDATIONS FOR FUTURE PROJECTS

End user companies should have well trained chemists so that in case the requested raw materials from the supplier are not available the formulations can be corrected. Note that there are many raw material suppliers and often the proper composition is not known and therefore the supplier of the equipment can not know how to modify the formulations.

NovaFlex® Acceptance Certificate

Date: 27.11.02

Customer: Safoum

54,002

LC / Contract Number:

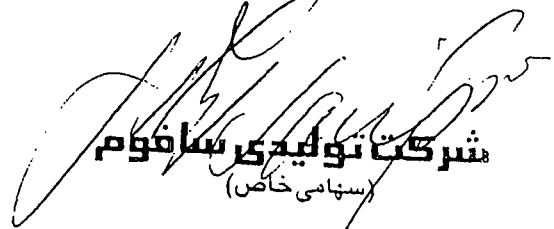
Hennecke order number: A0100... - 1023

1. Metering units
  - Piping connections leakage test
  - Functional verification all metering units parts
  - Verification metering capacity pumps
2. Electrical cabinets
  - Input-Output test
  - Software test
  - Hardware test
  - Functional testing prior to foaming
3. Mixing head and creamer
  - Verification installation creamer
  - Mixing head test prior to foaming
  - Functional testing mixing head and creamer system
4. System
  - Functional test all electrical interface connections
  - Functional test mechanical interface connections
  - General functional test foaming
5. Performance test
  - Foaming test at density 15 kg/m<sup>3</sup> +/- 1
6. Documentation review

Hennecke Installation Manager

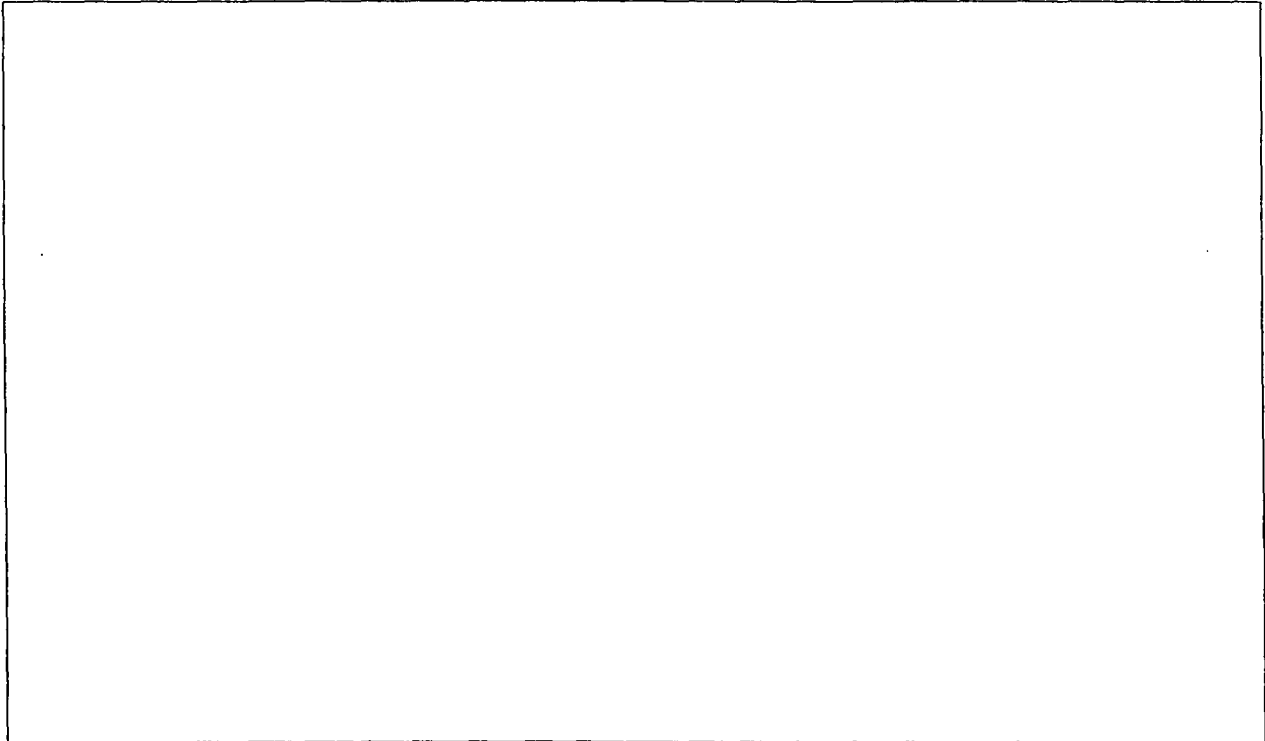


Customer



شرکت تولیدی سافوم  
(سهامی خاص)

Space for Clarifications or amendments.



Note: Minor amendments/clarifications are considered when the functional working of the system are not affected and the machine can be used for production

Major amendments/clarifications are considered when the functional working of the retrofitted equipment is incorrect and no production is possible

In case of minor amendments/clarifications the supplier shall provide inside a fixed time scale solutions or modifications to the machinery, these minor amendments /clarifications shall not be reason to rejection or not signature of the acceptance certificate.

In case of major amendments/clarifications the supplier shall provide all the necessary modifications before signature of the release of payment.