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Demonstration of low-cost options for the conversion to non-ODS technologies in polyurethane foams at very small users



Objectives

The project's objectives were to develop low cost foam dispensing units that demand low to no electrical power for low-volume pour-in-place (PIP)/spray rigid foam applications, as well as a variable ratio foam dispenser for PIP rigid or integral skin foam (ISF) applications that could be used by very small users; and to explore the options for pre packaged PU foam systems that are sealed, have a long lifetime and can be used upon demand.

Description

Technical specifications for specific dispensers featuring modifications for very small users were sent to interested equipment suppliers for bidding. After the open bidding, equipment was selected, purchased, and tested by systems houses using locally available water-based methyl formate and methylal formulations for rigid polyurethane foam (PU) and integral skin foam (ISF) applications. Baalbaki Egypt for Chemical Industries evaluated a Tecmac dispenser (PIP/Spray), Dow Middle-East evaluated a Pumer dispenser (PIP), and Technocom Commercial Agencies evaluated a Transtecnica dispenser (variable ratio for ISF).

Options for pre-packaged PU systems with stable storage for infrequent PU users were not explored, as there were no systems houses identified for participation.

Project title: Demonstration of low-cost options for the conversion to non-ODS technologies in polyurethane foams at very small users

Country	Egypt
Agency	UNDP
Sector	Foam
Sub-sector/ application	Rigid polyurethane (PU), pour-in-place (PIP) foam
Enterprise/ systems house	n/a
Baseline technology	HCFC-141b
Alternative technology	Methyl formate (MF), methylal
Global Warming Potential (GWP) of the baseline and alternative technology	HCFC-141b: 725 MF, Methylal: negligible
Potential safety issues	MF: flammable as pure
Ozone Depleting Substances (ODS) phase-out in mt	40
ODS phase-out in Ozone Depleting Potential (ODP) tonnes	4.4

Results

► Adapting existing equipment through technical specifications tailored to very small users resulted in suppliers providing basic foam dispensers that fulfilled the equipment requirements for PIP, PIP/Spray and ISF applications for those users at a lower cost and with overall positive equipment performance. However, the Temac and Pumer equipment operated on a fixed 1:1 ratio (polyol:MDI), which was incompatible with the Baalbaki Egypt for Chemical Industries and Dow Middle East systems houses. Water-based formulations require more MDI, which

leads to ratios of between 1:1.5 and 1:1.7. This makes variable-ratio foam equipment important for processors who want to keep their supply options open.

- Project follow-up showed that some equipment producers might be able to offer adjustments to the foam dispensers to allow them to be used with variable ratios of chemical systems.
- Project findings showed that systems houses were not interested in pre-packaged, fully developed polyol systems as these were very expensive and were for applications not prevalent in Egypt.



Cost analysis

► The costs gathered from the project showed that a basic high-pressure spray/PIP dispenser could be purchased for US \$7,000 rather than US \$10,000 (Temac); a basic low-pressure sole PIP foam dispenser could be purchased for US \$5,500 rather than US \$10,000 (Pumer); and a basic low-pressure ISF dispenser could be purchased for

US \$20,000 instead of US \$25,000-30,000 (Transtecnica) (all excluding costs for delivery, warranty and servicing). This could potentially reduce equipment costs of future foam projects for small and very small foam manufacturers. However, despite being less expensive, the basic ISF dispenser would likely only be affordable for very small users through funding from

the Multilateral Fund, as part of eligible costs in a submitted conversion project.

- For pre-packaged chemical systems, the related investment would be too high considering the risk of non-acceptance by systems houses and end-users.

Conclusions

With clearly identified minimum-level technical specifications for a basic foam dispenser, equipment suitable for very small users can be obtained from equipment suppliers for 30-50 per cent less than standard dispensers. Safety measures should be in place when

processing polyols, and training is required for technicians despite equipment being of simple design.

Where the market offers different ratios for the same application, the capacity to work with variable ratios is needed. A fixed rate dispenser is not well suited to such

markets but is suited to homogenous very small users' markets.

There was no interest for pre-packaged PU foam systems in Egypt at the time of the project given the high related investment. ■

Final report and Secretariat's comments:

<http://www.multilateralfund.org/84/English/1/8422.pdf>
Paragraphs 148-160 and Annex I



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