

DOW CORNING

## Site Improvement Winner

**D**ow Corning at its plant in Belgium produces solvent/silicone-based products for use in industrial applications. Solvents used are aromatic and aliphatic hydrocarbons. The solvent-based unit is dedicated to the production of paper coatings and defoamers.

The process consists of mixing and dilution of high molecular weight silicone polymers into solvent. The main raw materials, apart from the silicone, are the solvents. Since the unit was first installed there has been a continuous process of risk assessment and minimisation, especially regarding the risks associated with solvents.

The unit is classified to be flame and explosion proof (in accordance with regulation) and includes a sprinkler system. There is a general ventilation system (extraction) throughout the production unit as well as local extraction points where solvent concentrations are highest. There is also a nitrogen blanketing system for the mixing kettle. In addition to these local regulations further measures have been taken in the areas of environmental protection and industrial hygiene.



### Environmental Protection

**A** major source of solvent waste originates from the cleaning operation required between production of different types of end product, to prevent cross-contamination.



**This has been dramatically reduced via:**

- Improvement of the production schedule to minimise the cleaning frequency
- Implementation of novel cleaning procedures whereby the cleaning solvent for one type of product is retained for the next production batch of the same product family (the cleaning solvents are stored in external containers between production batches).

As a result the quantity of waste solvent has been significantly reduced. The nitrogen blanket used on the system for reasons of fire prevention is also a source of solvent release as the flow of nitrogen across the mixing unit has the tendency to evaporate some of the solvent. A study was carried out with the support of an external laboratory to monitor solvent emissions and optimise the nitrogen blanketing system so as to minimise them.

The types of packaging that have typically been used for these solvent-based products were one way packages. These packaging types would mean a small but significant level of solvent-based product being left in the packaging waste. To reduce this level of solvent contaminated waste packaging, returnable metallic packaging (1 ton) is used to ship solvent-based products to the end user.

### Industrial Hygiene

**A**s part of the Responsible Care commitment and as required by European Directive EEC/98/24 a Chemical Risk Assessment was performed and as a result of this evaluation, several actions have been implemented to minimise risks associated with production of solvent based products. These actions have focused on reducing the opportunity for contact with the solvents through reduction of manual handling of the products and raw materials.

#### These actions include:

- Bulk storage of solvent and raw materials as well as solvent based finished products thus reducing the frequency of contact with solvents.
- Installation of automatic charging systems for raw materials and discharging systems for finished products (further reducing the frequency of contact with solvent)
- Establishment of contaminated areas to include the entire production unit (Plus charging and discharging points), in order to prevent potential pollution of the environment through accidental spills.

A key point in the development of these actions and the establishment of new procedures was to include the production operators in the process, such that they have 'ownership' of the process.

