DOCUMENT REFERENCE: B3.007

SUBJECT: Waste statement

1. Chemical waste

In the operation of metal finishing systems it is essential to rinse components between process stages. The purpose of rinsing is to ensure that residual chemicals are removed from the surface to minimise cross contamination of the process stages (drag out) and to ensure the highest level of quality and performance. The amount of chemical retained on the surface from process stages depends upon the component design, fluid retained by surface tension and the time allowed for draining over the process stage. The volume of water used to maintain rinse water chemical will depend upon the amount of retained solution and the number of rinse stages available as outlined in the BREF Document covering the "Best available Techniques for the Surface Treatment of Metals and Plastics". Lotus has incorporated the concept of eco-rinsing to reduce water consumption whilst maintaining rinse quality. Other areas that introduce waste chemical cover the following:

1. The production of high purity final rinse water. Traditionally this has been generated by the use of de-ionisers requiring regular regeneration using sodium hydroxide solution and hydrochloric acid. An alternative approach is to use reverse osmosis membranes which require no corrosive chemicals to operate. Lotus has introduced a total reverse osmosis system to remove the need for chemical regeneration.

2. When alkali etching aluminium the base metal is dissolved in a solution of sodium hydroxide. The solubility of aluminium in this basic solution is 12g/l and above this figure alumina is precipitated producing a rock hard sludge which in turn produces severe operational problems. If this system is operated it is essential to discard part of the highly alkaline solution on a regular basis. To overcome this significant waste it is possible to operate long life etches which are designed to keep high levels of aluminium in solution and allow a steady state to be achieved. Lotus uses this etching technology on both lines to remove the need for continual discarding of the solution.

3. With sulphuric acid anodising it is essential to control the amount of aluminium in solution. This is required to overcome the precipitation of aluminium sulphate. To achieve this, the simple approach is to partially discard the sulphuric acid solution on a regular basis. An alternative approach is to include an ion exchange column to remove the aluminium. This removes the need to discard sulphuric acid anodising solution and this is equipment has been installed.

All chemical waste generated by the two finishing plants is contained in the rinse water. This water is passed directly to the effluent plant for treatment, precipitation of the metals and pH correction prior to entering the foul sewer. The precipitate is removed using a desludging system which generates a filter cake with a solids content of 30%. This filter cake is stored in a bulk container prior to disposal via a registered Waste Contractor. The filter cake has been analysed and classified as non hazardous.

The waste generated is a by-product of the finishing process and it is not possible to reclaim the material due to technical, cost issues and the content of the waste. In

controlling the waste water is used and the rinsing techniques used by Lotus minimise the water consumption. Studies have been carried out to establish if it is possible to recycle the waste water however this has highlighted significant technical and cost issues. One approach is to use an evaporator however the energy consumption and costs are significant and thus not viable.

Any other hazardous waste held onsite will be suitably bunded and, in line with duty of care requirements, removed by a licensed carrier and sent to an appropriately permitted disposal / treatment site.

2. Packaging waste

Packaging is used in the supply of chemicals and for components presented to the plants. The packaging for the products can be split into two categories:

1. Re-usable (IBC's and commodity chemicals and component packaging)
2. Recyclable via a suitable Waste Contractor.

Packaging waste for LLSA is considered as part of our wider producer return as required under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007. Lotus uses a compliance agent (Valpak) to support with this obligation.

3. Production rejects

Product rejection occurs for a variety of reasons, mainly cosmetic resulting from the quality of the paint finish. In most instances it is possible to rework the components. In the event that parts cannot be reprocessed they are recycled as aluminium waste. The level of rejection is monitored and if it increases above the norm action taken to identify the cause and act accordingly.

4. Storage of waste

The waste for storage is categorized and split into:

i) Effluent filter cake (non-hazardous)
ii) Non hazardous general office waste.
iii) Aluminium scrap metal
iv) Wood waste for recycling

All work to be processed is stored in re-usable plastic packaging and hence the waste generated is very low. Wooden and plastic grates alongside road transport stillages are used to transfer parts to and from the factory

The filter cake waste has been analysed by a third party and classified as non-hazardous waste.

5.0 Minimisation of waste

Every effort is made to minimise waste and in the case of the surface finishing operations. Whilst it is inevitable that waste will be produced the design of the systems reduces the amount of chemicals entering the effluent system. Solution control and maintenance is of paramount importance to the working life of a process and Lotus operates a system that ensures the need to discard process solutions is kept to an absolute minimum.