



**HYDRO**

## **2. ENVIRONMENTAL ASPECTS**

More than 65 years ago - in 1948 - Hydro Aluminium AluCoat (Now Hydro Aluminium Rolled Products AS), inaugurated a new era for aluminium coils. The pioneers in Holmestrand, Norway, succeeded in finding a surface finish which could withstand salt and acids of fish in cans.

In fact it started 11 years before that. In 1937 continuous electrolytic oxidation was tested and introduced to the fishcan industry. The research continued, and in 1948 our first continuous coil coating line was built. Basically, the technology used is the same today. The annual capacity of Line no.1 was 800 metric tons; this AluCoat needs less than a week to produce today.

Since 1948 we have built six continuous coil coating lines. The first lines have reached pension age. Today Hydro Aluminium have two high speed coil coating lines in Holmestrand. The capacity to produce are more that 50000 tons of lacquered materials, mainly to the building industry and for canning - and automotive products.

### **Environmental Aspects**

Hydro Aluminium Rolled Products AS was the first coil coater in the world (1997) to receive the ISO 14001 environmental certificate. For the last 10 years, the coil coating industry has worked hard to improve the environmental standards. This development has been for the last years more and more a market driven process with an increasing number of interested parties who have taken into account the environmental aspects of the process, the business and the final products. These interested parties does not just include customers and authorities, but neighbours, pressure groups (NGO's), owners, competitors, banks and insurance companies as well as the media.

The environmental awareness and consequential requirements from the end users and the society, is an important opportunity for the coil coating industry to promote an ecologically acceptable surface treatment process.

### **Anodising as pre-treatment**

Hydro Aluminium Rolled Products AS has anodising as the only pretreatment before applying coating to the surface. The process is electrochemical in nature using diluted sulphuric acid and alternating current electricity. Heavy metals like chromates or any other toxic chemicals are not used at all. The process combines both degreasing and pre-treatment within the same piece of equipment.

The aluminium strip is immersed in the electrolyte, normally sulphuric acid, and becomes one of the electrodes in a cell. When it is cathodic, gas is produced on the surface. This gas in combination with the chemical dissolution of aluminium oxide, give a cleaning action which remove oxide from the metal surface together with rolling oils and other contaminants. When the strip is made the anode, an oxide layer is built up, the anodic film.

The two stages described above are combined into one operation when the electrical current in the process is alternating. The polarity of the strip changes 50 times per second.

very thin oxide film in the range of 100-400 nm, with a specific physical structure designed to provide good adhesion to lacquers and optimum corrosion resistance.

### **Effluent treatment**

In contrast to the traditional pre-treatment processes there is no problem with the treatment of effluent from this "Hot AC process". There are no heavy metals, toxic or carcinogenic materials to worry about and the only significant by-product of the process, aluminium sulphate, is removed and has other immediate end uses such as water purification processes. The anodic pre-treatment is therefore the "greenest" possible from the environmental point of view.

The process can be represented by the sketch below and in practice the total process time including rinsing is approximately seven seconds.

