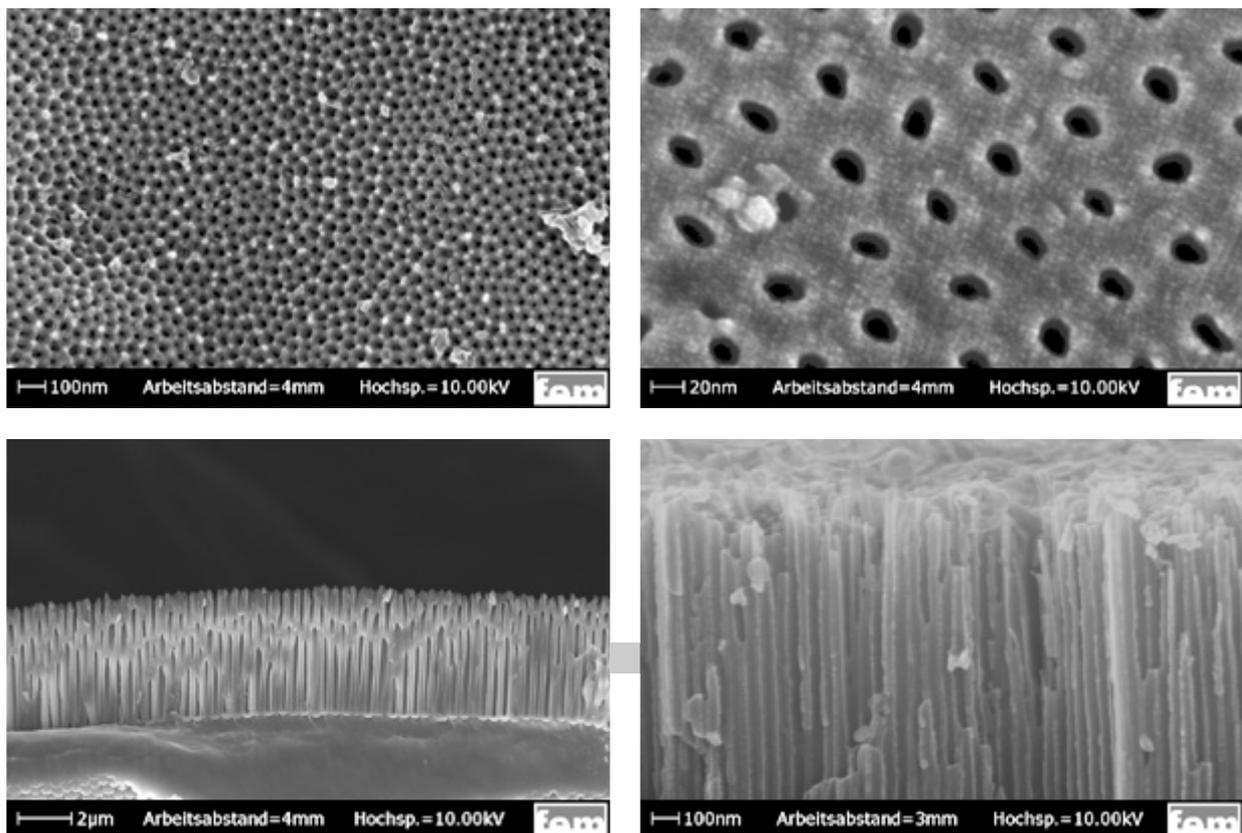


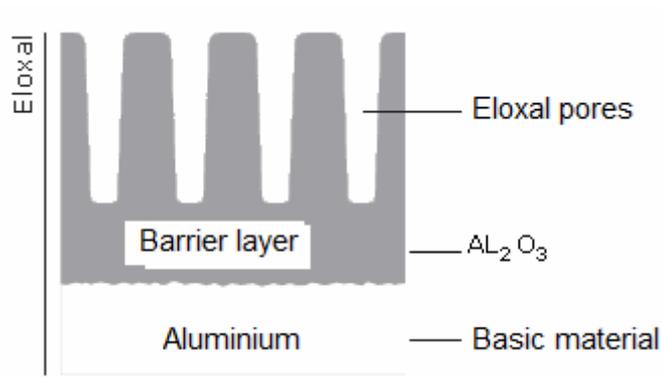
## The Eloxal process

Within the scope of a natural process, aluminium forms an oxide film which as a rule will protect the material against further attacks. This process is optimised under technical conditions in the Eloxal bath. This is the reason why aluminium is the only material which may be anodised. The natural oxide film of an aluminium component is only 0.1 – 0.5 µm thick, it is not decorative and has no particular hardness. On the contrary, a technologically generated Eloxal film has precisely specified characteristics concerning film thickness, film structure, hardness and optical homogeneity.



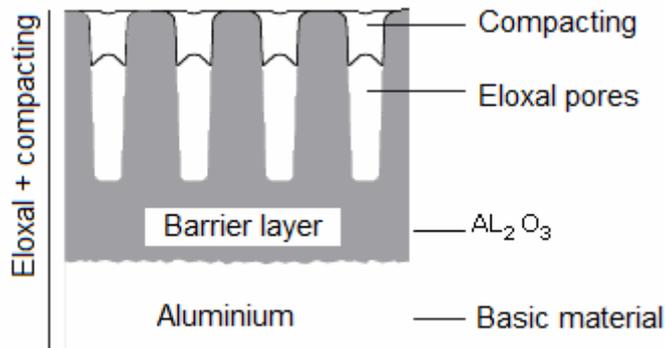
The Eloxal film is generated within an electrolyte, e.g. sulphuric acid. The material which must be anodised is used as an anode in the electrolytic bath, and submitted to a continuous current. The cathodes are situated at the edge of the bath. The Eloxal film, consisting of  $\text{Al}_2\text{O}_3$ , is formed during a very complex electrochemical reaction. To start with, a rather thin but closed barrier layer is formed. When the thickness of this layer increases, pores similar to capillary tubes are generated (see graph).

Graph: aluminium surface with empty Eloxal pores:



The parameters selected during the anodizing process allow defining characteristics such as hardness and pore size of the Eloxal layer. The open pored layer succeeding to the Eloxal bath offers the exclusive possibility of introducing different colours (gold, brown, black, blue, red, yellow, turquoise, etc.) into the pores. Thus, the colour is not on the surface, but is introduced into the Eloxal pores, so that it is completely protected (see also Colour Eloxal. The last step of the process is the compacting of the pores. In this step, aluminium oxide hydrate is formed under the effect of completely demineralised water at 100 °C. The transparent aluminium oxide hydrate is formed in the pores, closing them hermetically, thus supplying a supplementary protection for the colour (see graph).

Graph: aluminium surface with Eloxal pores and compacting



Compacting is an essential step for anti corrosion protection and assuring of long life for the aluminium surface.