

Lead bath and fluidized bed systems have served their time - the future belongs to the new

CPA AEOX Convection Film Cooling System with two-phase soaking furnace

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## **THE AEOX PRINCIPLE**

### **LESS ENERGY MORE QUALITY**

The revolutionary heat treatment technology by CPA

Lead is still said to be the ideal quenching medium for achieving a ductile pearlite structure within the patenting process. However, the days of the lead bath are numbered, as there are much more disadvantages coming up with this it. Environmental reasons and reasons of industrial safety because of the hazardous fumes speak against the lead bath. But most of all the high costs due to the preheating and energy losses, high service and maintenance efforts as well as the high costs of the melting material which has to be replaced again and again make the lead bath no longer up-to-date. Further arguments against the usage of the lead bath are the very inconvenient handling in the field of operation and maintenance, the lead dragging occurring at higher wire velocities and inappropriate scale which again can lead to higher efforts in the following pickling and cleansing baths up to necessary frequent and costly exchanges of the galvanic baths.

The same applies to Fluidized Bed Quenching systems. Here the main problem lies in the inefficient quenching velocity which again leads to unsatisfactory tensile strength results. Due to the usage of sand as abrasive heat transfer medium not only the surface of the wire but also the interior of the furnace, especially the required sand transport piping, is affected and becomes worn-out. Apart from that a frequent emission of sand and particulate matter can hardly be avoided which is now and in the future in no way compatible with a high quality manufacturing process in the field of galvanic coating, e.g. such as in the production of steel cord and saw wire.

The days of the lead bath and the Fluidized Bed Quenching systems are numbered. The company CPA Wire Technologies GmbH, a sister company of the control technology, MES and galvanic control system provider CPA Computer Process Automation GmbH and leading provider of high tech brass plating lines as well as payoff and take-up systems for the steel cord production offers a real alternative. The company succeeded in developing a completely new technical solution on the basis of the film boiling process with significant qualitative and economic advantages - within the framework of a research project funded by the Republic of Austria. This solution not only obviates the need for lead baths and fluidized bed quenching systems but also represents a significant quality improvement of so far applied water patenting systems.

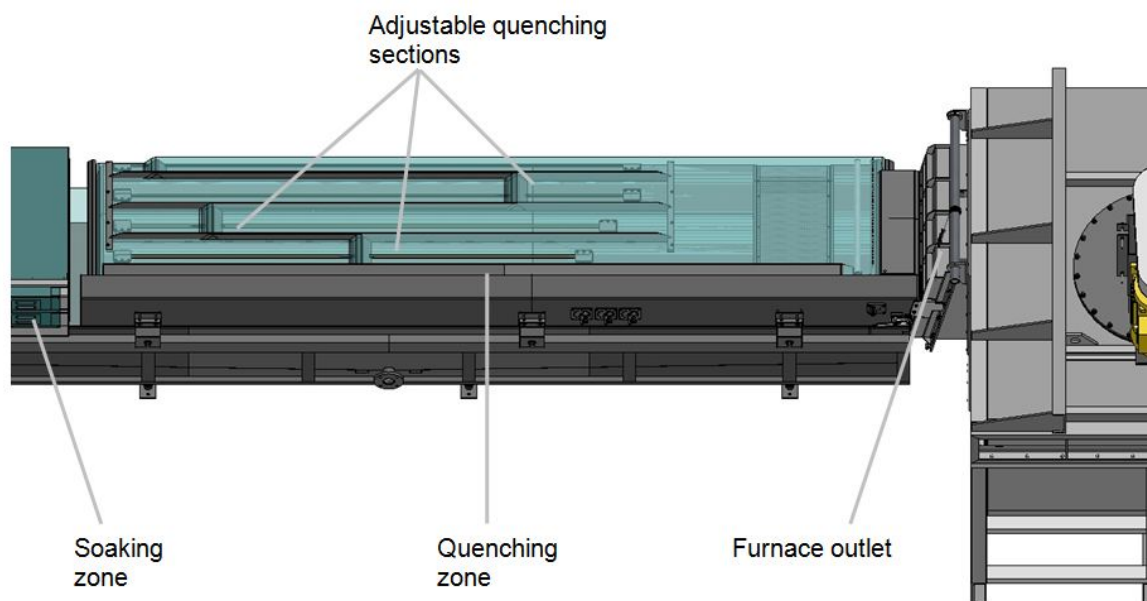
The required quenching for the patenting process after the austenitization is carried out in a water bath which is divided into several groups. The length of the water bath can be adjusted

manually or automatically and it is directly connected to a temperature-controlled two-stage soaking zone. This arrangement makes it possible to reach stable microstructural transformation results which can be qualitatively compared to lead baths, but without having to accept their disadvantages. Due to a significantly steeper temperature profile during the quenching period in contrast to fluidized bed systems the required tensile strengths can easily be reached without any problems and the problematic usage of sand can be completely omitted.

The new system of CPA (patent pending) can be used with larger wire dimensions as well as for very small diameters in the field of the final patenting of wires.

The CPA AEOX Convection Film Cooling System with two-phase soaking furnace can be combined with the new energy-efficient Convection and Recuperation Turbo Austenitization furnaces of CPA which provide energy savings of up to 40% and an adjustable part load capacity between 30 and 115% of the nominal furnace load. The CPA furnaces can also be combined with all other furnaces offered on the market and traditional existing furnaces.

### **AEOX Austrian Energy Optimized XFlow furnaces**



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