

RED CERAMICS FOR THE WATCH INDUSTRY

Problem – Challenge

With increasing cost pressure from globalization and the strong Swiss franc, innovation is becoming a key competitive factor for Swiss companies. This is one more reason to step up the collaboration between industry and research institutions in order to bring innovative ideas onto the market sooner.

Empa set about developing a red ceramic material that meets the high demands of the watch industry. The new material had to be non-toxic, which ruled out any compounds containing lead or cadmium for color schemes. A glaze on the ceramics was also unsuitable as it could chip off. The bezel therefore needed to be produced from colored ceramics that would also survive the subsequent engraving of the letters and numerals unscathed.

Solution

And so the Empa team opted for aluminium oxide as their material of choice – a common, white ceramic material used in artificial hips or as a seal in taps, for instance. Months of experimenting followed, where the researchers specifically mixed tiny amounts of chromium as well as inorganic additives into the ceramics. The multi-stage process to produce red ceramics was co-developed by the Swatch Group and Empa in a CTI project. The extremely complex production path has been protected by a patent application in March 2016.

