

## **KALMETALL Wear Protection for Heavy Impact and Sliding Wear**

For many years, Kalenborn have been known to successfully solve wear problems by the use of mineral and ceramic materials. These materials offer excellent operating results for predominantly sliding wear. However, in practice sliding wear is frequently associated with impact wear or combined sliding and impact wear occurs.

This is where metallic materials offer significant advantages and it is the reason why Kalenborn have extended their range of corresponding materials. The result of these efforts is a comprehensive array of KALMETALL wear protection products which include:

### **KALMETALL-W Hard Overlay Welding**

Hard overlay welding consisting of alloys of very high chromium and carbon contents applied to tough basic material of structural steel or corrosion and heat resistant steel. Tailor-made shapes of flat sections are feasible but also lining of individual components. This solution is particularly suitable for specific applications and for large surfaces. KALMETALL-W can be used as a construction material.

### **KALMETALL-C Hard Casting**

The Kalenborn range of products includes both hard chromium castings and hard manganese castings. The different shapes and geometries are cast in special moulds. This solution is of particular benefit for series-produced items. And, it can be realized for complex geometries. Hard castings are highlighted by a very good wear protection reserve.

### **KALMETALL-HM Hard Metal**

These are sintered tungsten-carbide shapes characterized by a good hardness/toughness ratio. They are soldered on tough basic material. Most varying surfaces and sizes can be lined . KALMETALL-HM suggests itself above all for specific applications subject to extreme wear.

### **KALMETALL-S Hard Metal Spray**

Hard to very hard plasma-sprayed nickel-chromium layers with an optional addition of tungsten carbide are sintered onto a tough basic material. There is practically no limitation with respect to surface, shape and size. Even existing items can be reliably protected against wear. The material can be exactly matched to the surface to be lined.

## **KALMETALL-HB Hard Steel**

KALMETALL-HB are quenched wear resisting steels that have been subjected to a special thermo-mechanical treatment. The flat plates can be cut and shaped for the specific application without difficulty. KALMETALL-HB enables cost-effective solutions for moderate wear. The material is also suitable for use on large surfaces. KALMETALL-HB can be used as a construction material.

Material combinations are of particular interest for plant operators. The point is to find solutions which on the one hand enable the required duty cycles and are moreover economically acceptable. Consequently, it is not always necessary to use the hardest and therefore most expensive material. The decisive aspect is the individual stress that acts on the various surfaces. Extending the metallic product range allows the use of a variety of ceramic materials, the combination of metallic materials or the combination of metals and ceramics.



Typical applications of KALMETALL-C hard casting are pipe systems; here the pulverized-coal pipe of a power plant in South East Asia



KALMETALL-HM with sintered tungsten carbide shape to protect a vertical roller