

## KALMETALL AND KALCAST: THE OPTIMAL SOLUTION EVEN FOR COMPLICATED WEAR PROBLEMS

## METALLIC WEAR PROTECTION: PREFERRED CHOICE FOR IMPACT WEAR AND ABRASION

### Preferred use of metallic wear resistant materials

Use	Examples	Material
High temperatures	Clinker chutes, clinker coolers Sinter crushers, sinter coolers	KALMETALL KALCAST, KALMETALL
Intense temperature changes	Coke benches (skirting boards)	KALMETALL, KALCAST, KALMETALL HB
Heavy impact stress	Impact zones in bunkers Belt transfer points Mill lining Crusher linings	KALMETALL KALCAST, KALMETALL, KALMETALL HB KALCAST, KALMETALL, KALMETALL HB /CB KALCAST, KALMETALL, KALMETALL HB
Strong dynamic forces acting on the components	Fan blades Separator blades	KALMETALL, KALMETALL TC KALMETALL, KALMETALL TC, KALMETALL HB
Self-supporting structures	Screens	KALCAST, KALMETALL, KALMETALL HB
Attachment problems	Flights of screw conveyors	KALCAST, KALMETALL, KALMETALL HB KALMETALL TC

### KALMETALL well suited for material combinations



KALCAST and KALCRET  
Use in a shredder system for plastic waste

A bucket wheel as an example of tailormade  
KALMETALL welded construction

KALMETALL TC combined with KALOCER  
high alumina ceramics as pipe brick material



KALENBORN OFFERS A COMPREHENSIVE RANGE OF METALLIC WEAR PROTECTION WHICH INCLUDE:

➤ **KALMETALL**

**Hard Overlay Welding**

Composed of alloys characterized by very high chromium and carbide content on a tough substrate made of structural steel or special steel

➤ **KALCAST**

**Hard Casting**

Chromium hard casting or manganese hard casting with high resistance to sliding and/or impact wear

➤ **KALMETALL TC**

**Tungsten Carbide**

Sintered tungsten carbide tiles with a good hardness / toughness ratio. The shaped elements are soldered on a basic steel body.

➤ **KALMETALL HB**

**Water-hardened Steel**

Hardened wear resistant steel plates subjected to a special thermo-mechanical treatment. KALMETALL HB is equally suited for forming and welding.

➤ **KALMETALL CB**

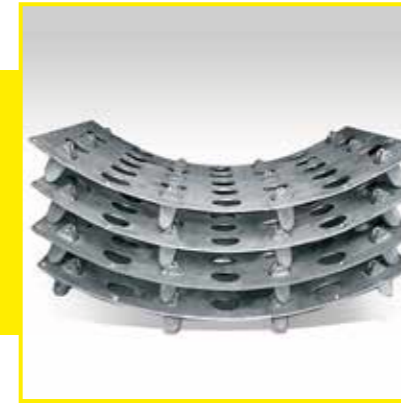
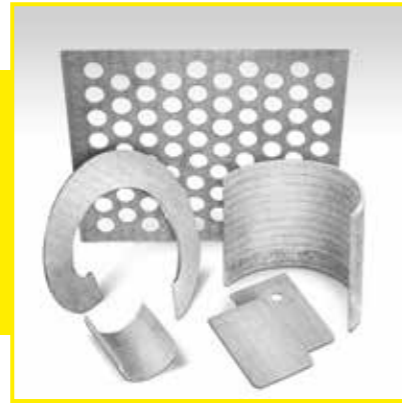
**Cast Bars**

Hard chromium casting plates KALCAST soldered on a tough substrate made of steel

➤ **MULTIPLE MATERIALS**

The best and most economical wear-protection often involves a combination of multiple materials. Metallic wear protection is well suited for material combinations with oxidceramic KALOCER or hard compound KALCRET. The choice of materials is dependent to the different wear conditions.

> FULL RANGE OF  
**METALLIC WEAR PROTECTION**



	<b>KALMETALL Hard Overlay Welding</b>	<b>KALCAST Hard Casting</b>	<b>KALMETALL TC Tungsten Carbide</b>	<b>KALMETALL HB Water-hardened Steel</b>	<b>KALMETALL CB Cast Bars</b>
	Very good wear protection on large surfaces	Very good wear protection for series-produced items or for complex geometries	Extreme wear protection	Cost-effective wear protection on large surfaces	Easy installation solution for heavy impact and abrasion
DESIGN	Hard overlay welding made up of alloys with very high chromium and carbon content on tough substrate of structural steel or corrosion and/or heat resistant steel Cuts and tailor-made shaping of the flat sheets are just as feasible as the lining of individual components	Chromium hard casting or manganese hard casting  The various shapes and geometries are cast in individual moulds	Sintered tungsten carbide shapes with a good hardness/toughness ratio which are soldered on a tough substrate  Complex surfaces and sizes can be lined	Hardened wear resistant steel plates having been given a special thermo-mechanical treatment  Cuts and tailor-made shapes of the flat sheets are feasible	High chromium white iron plates
ALLOY OF WEAR PROTECTIVE LAYER	Basic iron alloys of very high chromium and carbon content enabling further wear inhibiting alloys to be added	Basic iron alloys of very high chromium, manganese and carbon content enabling further wear-inhibiting alloys to be added	Sintered parts made of tungsten carbide and cobalt/nickel	Close grained treated steel of approx. 0.2% carbon and approx. 1% chromium	Basic iron alloys of high chromium white iron, metallurgically bonded to a mild steel plate
HARDNESS	700 to 820 HV	580 to 700 HV	1 800 HV	400 to 600 HB	700 HB
WEAR RESISTANCE	Very good	Good to very good	Very good	Good	Good to very good
IMPACT STRENGTH	Good to very good	Good	Very good	Very good	Very good
MAXIMUM TEMPERATURE	Up to 750 °C / 1,382 °F	Up to 350 °C / 662 °F	Up to 350 °C / 662 °F	Up to 250 °C / 482 °F	Up to 200 °C
THERMAL SHOCK RESISTANCE	Good	Medium	Good	Good	Good
DIMENSIONS	Sheets up to 1,900 x 3,900 mm Hard overlay welding from 3 to 18 mm Substrate from 5 mm upward	Wall thickness from 15 mm upward Total weight ranging from 20 to 3,500 kg	Dimensions 20 x 20 mm Thickness ranging from 2 to 5 mm	Sheets from 1,000 x 1,350 Thickness from 4 to 130 mm	Thickness from 23 to 100 mm
TYPICAL APPLICATIONS	Lining of mixers, bunkers, chutes, pipes, screens, hoppers, etc.	Mixer linings, mixing tools, hammers, grinding rollers and grinding plates	Mixing tools, scrapers, fan blades, housing linings	Screens, mixer linings, fan blades, housings, chutes	Chutes, silos, hoppers, pipes, etc.
ADVANTAGES	Well suited for special solutions Wear protection on large surfaces May be used as structural material	Well suited for series-produced items Wear protection for complex geometries	Well suited for special solutions in case of extreme wear stress	Cost-effective solution for moderate wear Wear protection for large surfaces Can be used as structural material	Easy to work, best solution for combined type of wear: abrasion and impact