

Industeel



ArcelorMittal

Creusabro®

Unique, Best, Proven



Creusabro® is a complete range of advanced abrasion resistant steel plates bringing added value to the various industries exposed to abrasive wear conditions.



A complete range to meet any situation

Abrasion resistance is not exclusively connected to the hardness of the steel in its delivery condition. Its composition and structure strongly influence the actual performance in service.

Creusabro® steels are genuinely different than classical low alloyed martensitic abrasion resistant plates. Creusabro® is designed to provide a cost effective combination of wear resistance and easy fabrication.

The original chemical composition and manufacturing processes applied to Creusabro® provides a unique combination of distinctive metallurgical features that extend the lifetime of wear parts in critical applications compared to classical wear plates.

COMMERCIAL GRADE	HARDNESS LEVEL, HB
Creusabro® Superten	300-380
Creusabro® 4800	340-400 → 410-470 ⁽¹⁾
Creusabro® 8000	430-500 → 500-570 ⁽¹⁾
Creusabro® Dual	430-500 → 500-570 ⁽¹⁾
Creusabro® M	180-220 → 520-600 ⁽¹⁾

⁽¹⁾ Surface hardness after in-service work hardening

Key metallurgical features

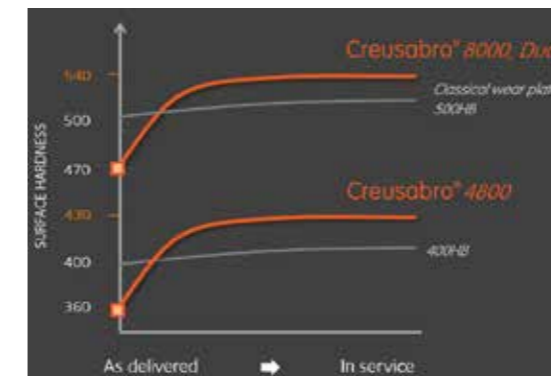
- In-service surface hardening effect up to +70 HB
- Fine dispersion of hard micro-alloyed carbides
- Deep-hardening, whatever the plate thickness
- High mechanical strength
- Tough and crack-resistant
- Uniform properties and low residual stresses
- Softening resistance up to 450°C

A unique concept

Properties of **Creusabro® 4800, 8000, Dual** result from the combination of an optimum alloying content and specific heat treatment procedures.

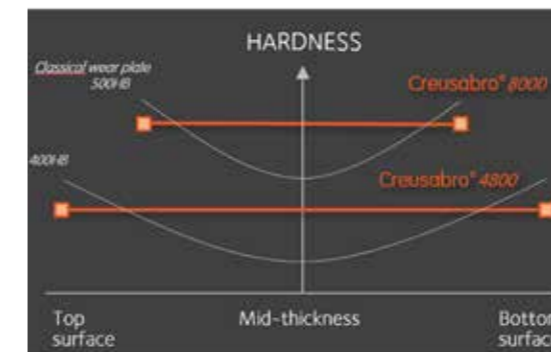
The soft quenching rates used in the mill fabrication practice:

- develop a bainite-martensite mixed microstructure with **retained austenite** with special properties.
- stimulate a fine dispersion of **hard micro-alloyed carbides**, which enhance the resistance to sliding abrasion
- produce a uniform **through-hardened** plate and low level of **residual stresses** within the plate.



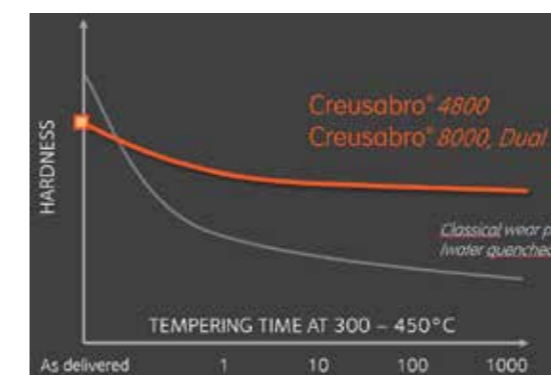
A REACTIVE SURFACE

Creusabro® 4800, 8000, Dual strongly improve their wear resistance in service by a surface hardening effect **up to +70 HB** under the action of local plastic deformations caused by impact with rocks or pressure by the abrasive particles. This is known as **TRIP-effect** (Transformation Induced Plasticity).



DEEP HARDENING

The soft quenching rates used in the mill fabrication practice produce a uniform **through-hardened** plate and low level of **residual stresses** within the plate.



HIGH TEMPERATURE RESISTANCE

The grades are suitable for continuous **operating temperatures up to 450°C**. Specific chemical composition and initial microstructure result in a high resistance to softening compared to classical water quenched steels, which lose their hardness above 220°C.

The choice of Creusabro® steels during product design or maintenance repair will bring multiple benefits, including:

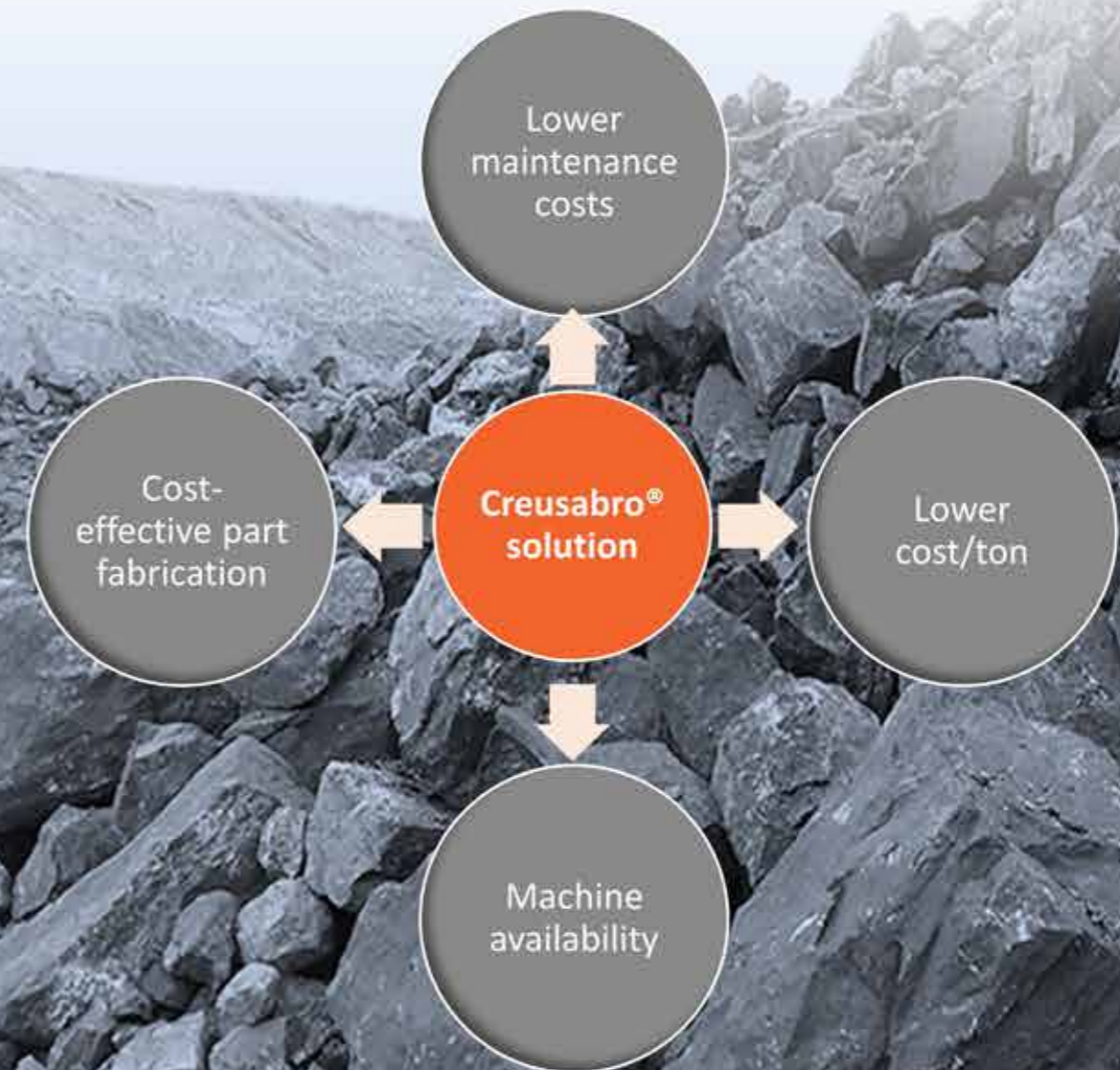
1	Longer service life by +50 to 100%	<ul style="list-style-type: none"> • Creusabro® 4800 outlasts classical 400-450 HB plates • Creusabro® 8000 & Dual outlast classical 500-550 HB plates, overlay products, chromium cast irons... • Substantial weight savings and increased payload potential (lower thickness is required) for the same wear life as standard water quenched plates
2	Structural capacity in a wear plate	<ul style="list-style-type: none"> • It offers the toughness and weldability necessary to perform not just as a wear liner, but as a construction material capable to withstand complex structural loads
3	Workshop-friendly	<ul style="list-style-type: none"> • Softer material in the as-delivery condition without compromising on the wear resistance in service conditions • "Dead flat" plate → excellent flatness with no residual stresses • Uniform properties over the whole plate and thickness • Excellent forming and welding characteristics
4	Heat and wear resistance	<ul style="list-style-type: none"> • In-service temperature up to 450°C • Reduced Heat Affected Zone on thermal cut edges and welds • Can be hot formed without any subsequent heat treatment
5	Corrosion and wear resistance	<ul style="list-style-type: none"> • Outperforms classical wear plates or stainless steels exposed to the combined effects of abrasion and corrosion in wet or mild corrosive environment

Optimum performance, long-term savings

For many years, Creusabro® abrasion resistant steels provide optimal solutions that translate into significant reduction of total cost of ownership and improvement in operational profitability.

Correct materials selection offers the potential to translate into major savings in fabrication and maintenance costs, increased payload and productivity, and enhanced machine performance.

The minor initial cost difference in the base material is far outweighed by the direct costs of part fabrication, consumables and labor for repairs/replacements, as well as the even higher indirect costs such as inventory costs and production losses due to machine unavailability.



We can support you on the road to success

- Wide dimensional program and extensive industrial experience
- Worldwide distribution and prefabrication services
- Technical assistance from our dedicated team of specialists
- In-house R&D to keep our products at the leading edge of innovation



Dimensional program

It all starts with advanced metallurgical processes to produce premium steel.

Creusabro® plates are produced by low CO₂ process in Belgium and France by ArcelorMittal Industeel, a leading European producer for industry specialty steels. They are available in a wide dimensional range from 3 to 180 mm thick depending on the considered grade. Standard plate sizes are typically 6000, 8000 or 12000 mm long and 2000 or 2500 mm width. Tailored dimensions are available upon inquiry within the limits given in the table.

	Max width (mm) per thickness (mm)															
	3	4	5	6	8	10	12	20	25	50	60	100	130	150	180	
Creusabro® Superten												2500				2200
Creusabro® 4800	1500	2000	2250	2500	3000	3500					2500				2000	
Creusabro® 8000		1500								2500						
Creusabro® Dual										2500						
Creusabro® M			2000	2500						3000					2500	

Worldwide presence

Our success is driven by partnerships with specialized steel service centers.

- Extensive inventory of available stock plates
- Unparalleled experience with multiple applications across various markets and industries
- On-time delivery of fabricated parts precisely designed to meet customer specifications

To find your nearest distributor or Industeel sales office, please visit <https://industeel.arcelormittal.com/products/wear-resistant-steels/>

Creusabro® M The genuine fine-grained 12-14%Mn austenitic manganese steel

The outstanding strain hardening capacity of austenitic manganese steel (**Hadfield steel**) has been recognized for a long time. In its delivery condition, Creusabro® M hot-rolled plate is virtually carbide-free and exhibits a moderate hardness of typically 220 HB. When subjected to impact loads in service, the surface layer of Creusabro® M steel work hardens considerably **up to 500 HB and above**, while keeping excellent ductility and impact resistance in the bulk of the plate.

Creusabro® M has found many applications in crushing and earthmoving equipment, in railways and in the shot blasting industry. Due to its wrought structure, Creusabro® M offers enhanced properties compared to standard cast Mn parts.



Which grade suits you best ?

Besides the high versatility of the original 4800 and 8000 grades, complementary special grades are also available to meet all situations. Because there is no one-size-fits-all solution to the abrasion challenges.

Creusabro® Superten Extra-thick wear plate with enhanced crack resistance

- production range 50 to 180 mm
- nominal delivery hardness of 340 HB
- guaranteed tensile and impact properties

Creusabro® Superten is an abrasion resistant steel with ultra-high tensile properties and enhanced crack resistance for massive structural parts submitted to heavy loads in service.

Typical applications: **lip blades** in large buckets, **ripper tooth** for excavators, **demolition and scrap shears** and any component where high resistance to abrasion is required together with high toughness, crack resistance and a good workability.



Creusabro® Dual Extra hard titanium carbides in a wrought steel

Creusabro® Dual is alloyed with **high titanium content**. The combination of a pre-hardened matrix (comparable to the C8000 grade) with the additional abrasion resistance of **coarse titanium carbide particles** provides superior abrasion resistance under sliding wear conditions, while remaining immune to impacts.

This innovative grade is mainly dedicated to severe applications where conventional 550 to 600 HB steels, hard-facing, overlay plates or hard-cast parts are usually implemented despite their poor fracture properties. Creusabro® Dual has found multiple applications such as transfer chutes, vibratory feeder liners, screens, truck tray liners, bucket wear bars...



COMMERCIAL GRADE	UTS MPa	CVN (0°C) J	C %	Mn %	Cr %	Ni %	Mo %	OTHERS
Creusabro® Superten	1100	70	0.18	1.2	0.7	1.5	0.5	Q&T
Creusabro® 4800	1200	45	0.15	1.0	1.6	0.3	0.3	+ Ti, Si, Cu
Creusabro® 8000	1600	50	0.25	1.2	0.7	0.5	0.3	+ Ti, Si, Cu
Creusabro® Dual	1600	15	0.40	1.2	0.7	0.5	0.3	+ 0.6%Ti
Creusabro® M	950	140	1.1	12	-	-	-	

For detailed technical description of the grades characteristics, please refer to our product datasheets and Creusabro® user guide available at <http://industeel.arcelormittal.com>

Creusabro® solutions for Excavation and bulk handling



Excavation, hauling and bulk material handling are the foundation of the mining, quarrying, and mineral industries. Hard rocks and heavy impacts are often the cause of important wear issues. Creusabro® extends the service life of critical components and avoid costly machine downtime. In mobile equipment, payload and weight are also of primary concern. The lower thicknesses required with Creusabro® for the same wear life as standard water quenched plates, offer substantial weight savings and increased payload potential.



Komatsu PC3000 Bucket Liner Kits in Hard Rock Gold Mine

Creusabro® 8000 liners replacing classical 450 HB water quenched plate, Australia

450 HB : 2500 hours
C8000 : 5600 hours

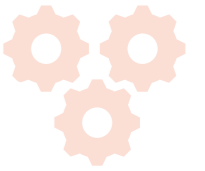
+125% improvement in liner wear life.

Estimated Bucket Maintenance Cost Saving:
~ \$ 96,000 / bucket / year

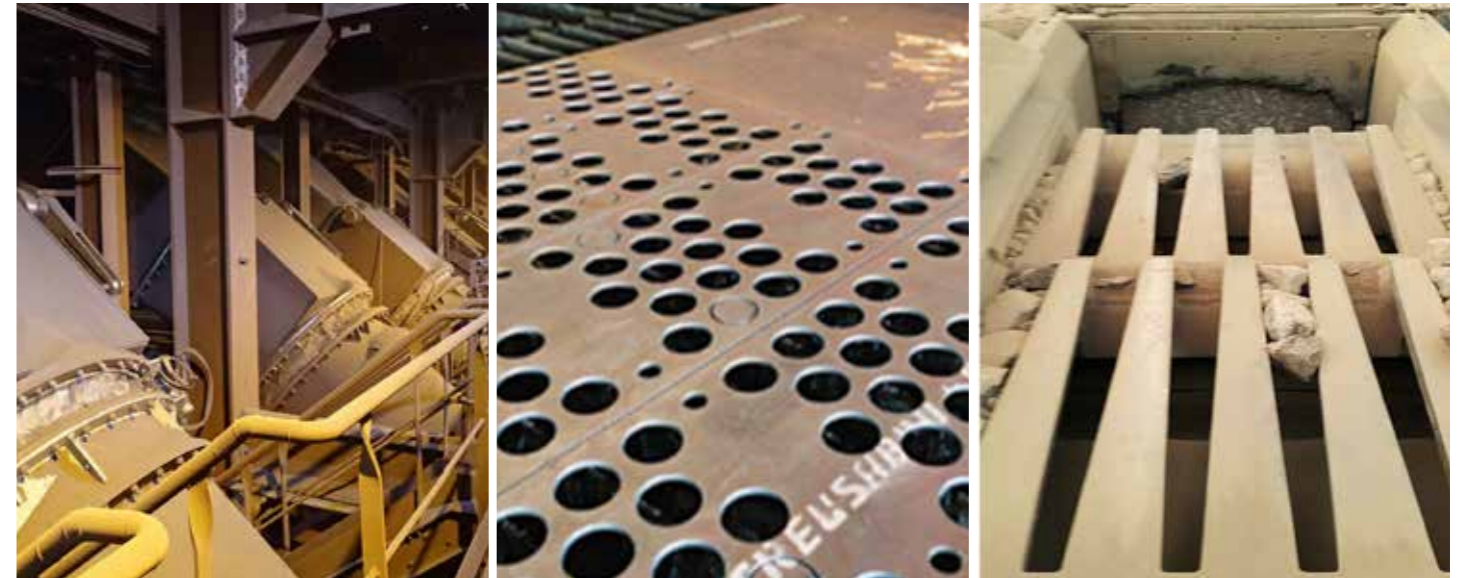
The minor initial cost difference in the base material is far outweighed by the direct costs of kit fabrication and installation



Creusabro® solutions for Crushing and screening



Raw mineral processing includes a large number of technologies for comminution and sizing. In operations where coarse and fine particles of different materials are processed, excessive wear occurs due to the combined effects of high impact, compression load and sliding of abrasive feed. Creusabro® prevents excessive wear and ensure smooth and cost-effective industrial operations.



Iron Ore Mine Crusher Feed Chute Application

Creusabro® DUAL liners replacing weld overlay plate, Australia

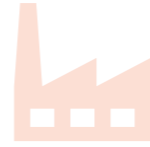
Original 19+12 mm weld overlay studded crusher feed liners failed due to impact load from isolated rocks.

The feed chute relined with CDUAL in 30 mm bolted liners solved the problem as the material was able to handle both the high abrasion wear and impact loads.

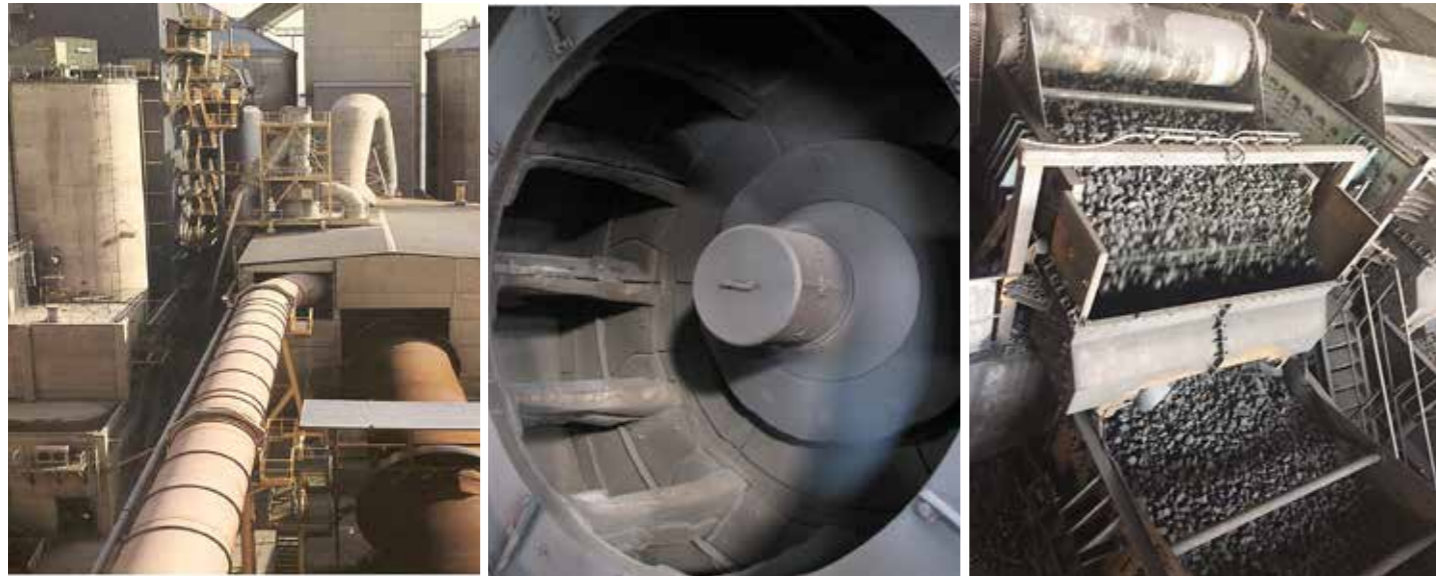
Wear through the full liner thickness has **prolonged the overall lifetime by +250%**.



Creusabro® solutions for Cement & industrial applications



After extraction, industrial transformation of minerals generally involve high temperature processes that only worsen the abrasion. Creusabro® is suitable for all types of abrasion, dry or wet environments, including operating temperatures up to 450°C. Power plants, Iron and Steel plant, Cement works, Asphalt or Glass industries all benefit from the unique characteristics of our Creusabro® abrasion and temperature resistant steels.



Wear Components for Raw Vertical Roller Mills

Creusabro® 4800 replacing weld overlay plates, Morocco - Indonesia
Operating temperature ~ 300 °C

Original weld overlay solution provided a limited service life due to its excessive brittleness under repetitive impacts. In addition, the high operating temperatures in service up to 300°C inevitably result to an opening of existing surface cracks, thereby speeding up the erosive wear.

Creusabro® 4800 combines a higher formability required for complex part fabrication, and higher wear and heat resistance resulting to an **increase in service by 30 – 50%**.



Creusabro® solutions for Demolition, waste and recycling



Waste recycling plays a growing role in modern economies as a way to reduce the use of natural resources and energy consumption. Heavy duty demolition equipment, waste, and recycling machinery are subject to very severe service conditions. Abrasion and fatigue are often induced by the heavy cyclic loads in these operations. Creusabro® provide a unique combination of wear resistance, toughness, crack resistance and fatigue strength.



Heavy Duty Shredder Knives and Anvils

Creusabro® 8000 replacing 500 HB water quenched plate or tool steels, Germany

Homogeneous material properties (through hardened), high strength and toughness improve resistance of the cut edge surface against wear and cyclic loads.

Reduced HAZ during plasma or oxy-cutting improves edge sharpness and longevity.

As a result, **+50% longer lifetime** was achieved. C8000 enables to close the gap with tool steels at a lower cost/ton of fragmentized material.





ArcelorMittal

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