

# CREUSABRO® 4800®

EASIER TO TRANSFORM, HARDER IN SERVICE

— **CREUSABRO® 4800®** is a high performance wear resistant steel exhibiting on average a wear resistance 40 - 45 % higher than conventional 400 HB water quenched steel in optimised conditions (sufficient impact or pressure).

— **CREUSABRO® 4800®** offers the best possible balance between exceptional wear resistance and improved workability. Application markets of **CREUSABRO® 4800®** are: mining, quarrying, cement industry, steel production, public works...

## Chemical composition

C	Mn	Ni	Cr	Mo	S	P
≤ 0.20	≤ 1.6	~ 0.20	≤ 1.9	≤ 0.4	≤ 0.005	≤ 0.018

## Mechanical properties in delivery condition (indicative values)

Hardness (HB)	YS (MPa)	UTS (MPa)	A (%)	KCVL - 20 °C (J / cm <sup>2</sup> )	Elasticity modulus (GPa)
370	900	1200	12	≥ 40	205

— **Hardness:**  
340 - 400 HB (at delivery condition).

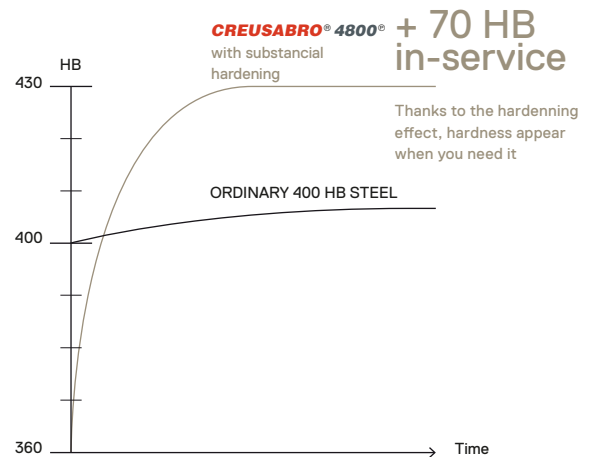
— **Toughness:**  
KcvL -20 °C (-4 °F): ≥ 40 J / cm<sup>2</sup> (≥23.6 ft.lbs).

## Metallurgical concept

— Abrasion resistance is not exclusively connected to the hardness of the steel in its as delivered condition. Its composition and structure strongly influence the actual performance in service. The Chemical composition and manufacturing processes applied to **CREUSABRO® 4800®** develop a metallurgical structure, which contributes strongly to the improvement of its wear resistance through the following effects.

— **CREUSABRO® 4800®** originality is to be delivered at an intentionnal limited hardness in order to bring to subcontracter and manufacturer an easier way to work with. Bending in easier conditions (limited power requested), rolling in easier way (once again limited power requested), machining easier due to homogeneous micro-structure.

— **Surface reactive:**



# Processing information

## — Drilling:

Can be done with high speed tools, HSSCO type. (ex. AR.2.9.1.8 according to AFNOR, M42 according to AWS) Lubrification with soluble oil diluted to 20 %.

## — Cold bending:

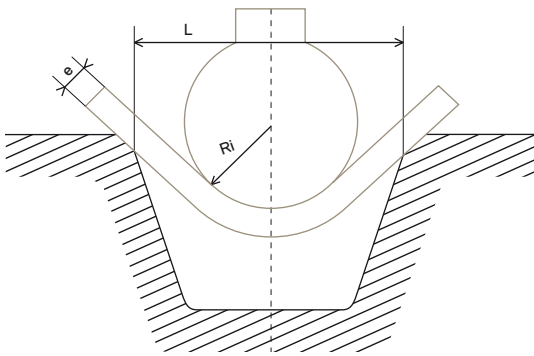
Can be done without any problem when the following conditions are met:

- No mark or scratches in shaped zones, mainly on extrados face;
- Beveling by grinding of edge angle specially on extended skin;
- Eventually grinding to remove cutting slight defects;
- Minimum internal bending radius (table below);
- plate temperature > 10 °C.

	Internal minimum radius	Die opening minimum
Perpendiculaire	3 x th	12 x th
Parallèle	4 x th	12 x th

— The strength necessary to bend depends on UTS and plate thickness as well as length bend and die opening V.

Thickness (mm (in))	Bending strength per meter (tons/m)
5 (0.20)	70
10 (0.39)	130
20 (0.78)	250



## — Flame cutting:

All the classical flame cutting processes can be used: oxygas, plasma, laser. whatever the flame cutting process used, the following conditions are good enough to avoid any risk of cold cracking.

products temperature	Thickness ≤ 60 mm	Thickness > 60 mm
≥ 10 °C	without preheating	preheating : 150 °C
< 10 °C	preheating : 150 °C	preheating : 150 °C

## — Hot forming:

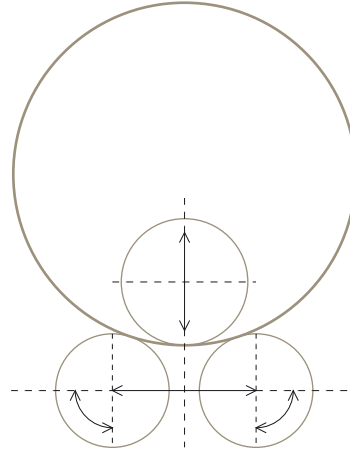
Please refer to our technical documentation.

## — Milling:

Shall be done with HSSCO tools (AR.6.5.2.5. according to AFNOR, M35 according to AISI or AFNOR AR.12.0.5.5 / AISI T15).

## — Rolling:

Has to be done using the following conditions:  $\varnothing \geq 30 \times th$  (temperature of the piece  $\geq 10 \text{ °C}$ .) Power necessary to roll a plate will be about double than a S355 type steel.



## — Welding:

**CREUSABRO® 4800®** can be welded by all traditional welding processes: manual, semiautomatic under gas, automatic under fluxes. For welds non exposed to wear, the following welding rods can be used.

— Allow for a tight bending angle to compensate spring back effect.

Processus	AFNOR	DIN	AWS
Manuel electrode	A81-309	DIN 1913 Class E51 43 B10	AWS 5-1 Class E7016 ou 7018
	A81311 GS2	DIN 8559 SG2	AWS A-5-18 Class ER 70S4 ou ER70S6
Semi-automatique sous flux	A81350 TGS	DIN 8559 SGB1 CY 4255	AWS-520 Class ER 71T5
	51 BH		
	TGS 47 BH		

Process	input (kJ/cm)	pre/post heating thickness (mm)						
		30	40	50	60	70	80	90
Gas metal arc welding	15							
	30							
Shield metal arc welding	10							
	20							
Submerged arc welding	20							
	30							

without pre heating
  pre/post heating a 75 °C
  pre/post heating a 125 °C

— For weld bead exposed to wear, please ask for advice on the choice of welding products and processes and parameters. Welded area must be free of grease, water, oxides... Electrodes and flux shall be dried according to supplier recommendations. The following preheating conditions shall be met (weld without excessive stresses).

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## Dimension tolerance

— According with EN 10051 (December 1997).

Thickness range	Size range	Delivery condition
3 to 150 mm	Width 1000 to 3000 mm	5 up to $\leq$ 20: termomechanical treated
	Lenght up to 6 000 mm	> 20 $\leq$ 50: oil quenched
	Other sizes: please contact us	> 50: WQI water quenched

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## General note

— If further informations are required, please request a copy of our technical guide.

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## Contact

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