

# Conventional High-Speed Steel Evoloop® C8

# ERASTEEL

**Evoloop® C8 is a conventionally manufactured cobalt-alloyed High-Speed Steel, characterized by a high resistance to high temperatures, and a very high hardness.**

## STANDARDS

> EN 10027-1: HS 5-6-2-8

## DELIVERY HARDNESS

- > Typical soft annealed hardness is 260 HB
- > Cold-drawn and cold-rolled material is typically 10-40 HB harder

## CHEMICAL COMPOSITION

Safety datasheet available

C	Cr	Mo	W	Co	V
1.05	4.0	6.0	5.0	7.8	1.6

## APPLICATIONS

- > End mills
- > Milling cutters
- > Twist drills

## FORM SUPPLIED

- > Square bars
- > Round bars
- > Flat bars

Available surface conditions: drawn, ground, peeled, hot-rolled, turned.

## HEAT TREATMENT

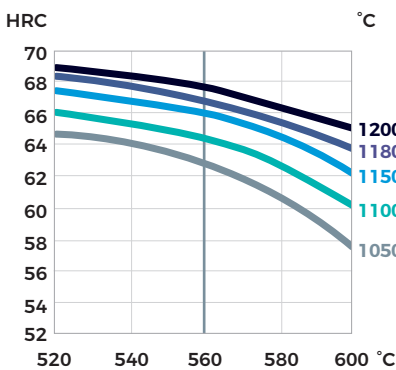
- > Soft annealing in a protective atmosphere at 850-900°C for 3 hours, followed by slow cooling 10°C per hour down to 700°C, then air cooling.
- > Stress-relieving at 600°C to 700°C for approximately 2 hours, slow cooling down to 500°C.
- > Hardening in a protective atmosphere with pre-heating in 2 steps at 450-500°C and 850-900°C and austenitising at a temperature suitable for chosen working hardness.
- > Tempering at 560°C three times for at least 1 hour each time.

## PROCESSING

Evoloop® C8 can be worked as follows:

- > machining (grinding, turning, milling)
- > polishing
- > hot forming
- > electrical discharge machining
- > welding (special procedure including preheating and filler materials of base material composition)

## GUIDELINES FOR HARDENING



Tempering temperature in °C.

Hardness after hardening, quenching and tempering 3 x 1 hour

## GRINDING

During grinding, local heating of the surface, which may alter the temper, must be avoided. Grinding wheel manufacturers can provide advice on the choice of grinding wheels.

## SURFACE TREATMENT

The steel grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

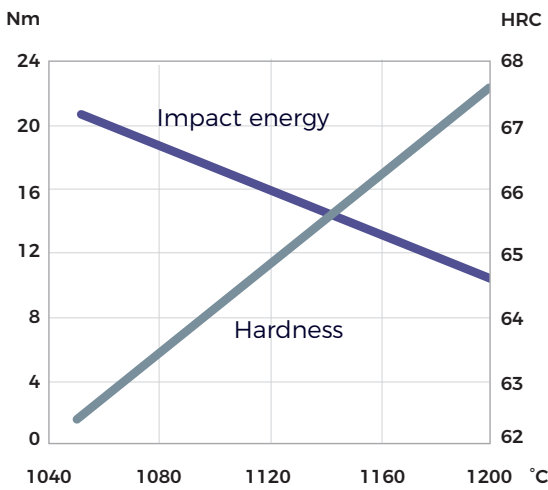
Tool	Hardening	Tempering
Single-edge cutting tools	1200°C	550-570°C
Multi-edge cutting tools	1150-1180°C	550-570°C
Cold work tools	1050-1150°C	550-570°C

**PROPERTIES**

**PHYSICAL PROPERTIES**

Temperature	20 °C	400 °C	600 °C
Density g/cm <sup>3</sup>	8.1	8.0	7.9
Modulus of elasticity kN/mm <sup>2</sup>	230	205	184
Thermal expansion ratio per °C	-	11.5x10 <sup>-6</sup>	11.8x10 <sup>-6</sup>
Thermal conductivity W/m°C	24	28	27
Specific heat J/kg °C	420	510	600

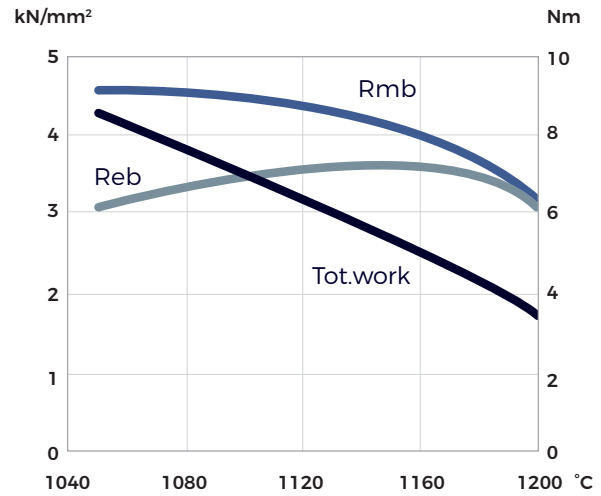
**IMPACT TOUGHNESS**



Hardening temperature in °C

Tempering 3 x 1 hour at 560 °C  
Unnotched test piece 7 x 10 x 55 mm

**4-POINT BEND STRENGTH**



Hardening temperature in °C

Tempering 3 x 1 hour at 560 °C  
Dimension of test piece Ø 4.7 mm

Rmb = Ultimate bend strength in kN/mm<sup>2</sup>  
Reb = Bend yield strength in kN/mm<sup>2</sup>  
Tot. work = Total work in Nm

**COMPARATIVE PROPERTIES**

