

## AISI : O1 – W 1.2510

**O1** is a general purpose cold working tool steel, it combines an easy oil hardening process with very low deformation, deep hardening properties, a fine grain structure along with very good toughness and a good polishability.

O1 has a better wear resistance than O2 without any decrease on the toughness thanks to its 0.6% V content.

This grade is typically used for:

- > Knives, cutting blades, shearblades.
- > Cutting tools in wood industry, paper industry or plastic industry.

It is also recommended for:

- > backing plates, rails, measuring devices and inserts for plastics molds.

### PROPERTIES

#### STANDARDS

- > **EURONORM**            100 MnCr W4
- > **WERKSTOFF**        W1.2510
- > **ASTM A681-9**        AISI O1

#### CHEMICAL ANALYSIS

Heat analysis in weight %		C	Si	Mn	W	Cr	V	S	P
<b>O1-2510</b>	Min	0.85	0.10	1.00	0.40	0.40	0.10	-	-
	Typical	0.95	0.40	1.20	0.50	0.50	0.10	< 0.030	< 0.030
	Max	1.00	0.50	1.40	0.60	0.60	0.10	< 0.030	< 0.030

#### MECHANICAL PROPERTIES

This grade is delivered annealed with hardness  $\leq 212$  HB.

Typical values for plates air quenched and tempered (thickness 45 mm - 1.8").

Elastic Modulus	
GPa	KSI
210	30

#### PHYSICAL PROPERTIES

Thermal conductivity $W\ m^{-1}\ K^{-1}$	Thermal expansion coefficient $10^{-6}\ C^{-1}/10^{-6}\ K^{-1}$		
100°C 212°F	20-100°C 68-212°F	20-200°C 68-392°F	20-500°C 68-932°F
30	11.5	12.0	12.8

## PLATE PROCESSING

### METALLURGICAL PROPERTIES

O1-2510 has an excellent deep hardenability resulting in good geometry and great toughness.

O1-2510 is suitable for hard chrome plating, PVD or CVD Coating (Do not exceed 30° below latest tempering temperature).

Internal soundness:

All plates are ultrasonically tested according to SEP 1921 Ed 1 12/84 Gr4 Class D/d.

### HEAT TREATMENT

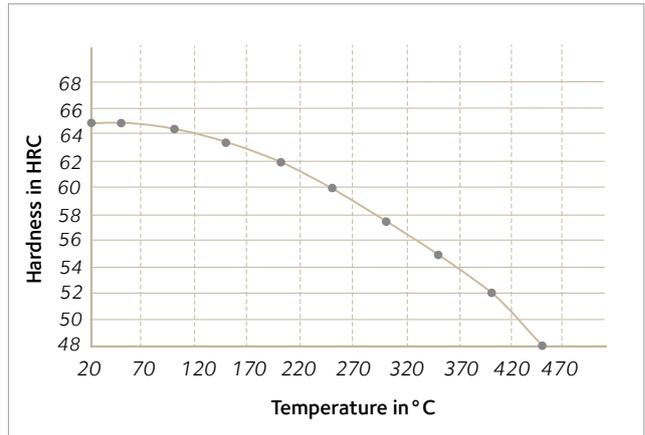
- > **Heat up** to 650°C
- > **Heat up** to 780-820°C with a sufficient holding time (30min after temperature equalize)
- > **Then quench immediately** in warm thin agitated quenching oil at 55°C or salt bath at 180-220°C. Hardness after quenching 64 HRC.

**Tempering:** Heat O1-2510 at least two hours per 25 mm thick according to desired final hardness\*. It is essential to make a double temper, heating temperature cycles 150°C to 250°C.

**Annealing:** Heat O1-2510 at 750-780°C at least 2 hours per 25 mm thick. Then cool down at a rate of 10/20°C per hour to 600°C, the cool in Air.

\* (see tempering curve)

Tempering curve O1-2510



**Stress relieving:** Heat O1-2510 at 50°C below the last tempering temperature, then slow cooling in furnace. If complex shape hold on in neutral atmosphere for a couple of hours.

## DELIVERY CONDITIONS

### DIMENSIONAL PROGRAM

Thickness	
10 - 125 mm	Ingot casting hot rolled

## YOUR CONTACTS

**Perrine Lavalley**  
Tel. +33 3 85 80 52 56  
[perrine.lavalley@arcelormittal.com](mailto:perrine.lavalley@arcelormittal.com)

<http://industeel.arcelormittal.com>

**Industeel France**  
Le Creusot Plant  
56 rue Clemenceau  
F-71202 Le Creusot Cedex

Technical data and information are to the best of our knowledge at the time of printing. However, they may be subject to some slight variations due to our ongoing research programme on steels. Therefore, we suggest that information be verified at time of enquiry or order. Furthermore, in service, real conditions are specific for each application. The data presented here are only for the purpose of description, and considered as guarantees when written formal approval has been delivered by our company. Further information may be obtained from the address opposite.