

## UR™ 64

### UR™ 64: A non magnetic high strength stainless steel

UR™ 64 is a non magnetic stainless steel combining:

- > excellent pitting corrosion resistance in marine environments
- > high strength
- > excellent ductility

### PROPERTIES

#### STANDARDS

> EURONORM: EN 1.3964 X2 CrNiMnMoNNb 21-16-5-3 according to SEW 390/W1.3964

#### CHEMICAL ANALYSIS - WEIGHT %

Typical values

C	S	P	Si	Mn	Cr	Mo	Ni	N	Nb
<.030	<.005	<.025	<1.0	4.0 - 6.0	20 - 21.5	3.0 - 3.5	15 - 17	.20 - .35	<.25

#### PHYSICAL PROPERTIES

Temperature interval (°C)	Thermal expansion ( $\alpha \times 10^{-6} \text{ K}^{-1}$ )	Thermal conductivity ( $\text{W.m}^{-1}.\text{K}^{-1}$ )	Relative permeability	Young modulus E (GPa)
-196 - +20	12.0	13.9	$\leq 1.01$	195
20 - +100	15.7			
20 - +200	17.0			

## PROPERTIES

### MECHANICAL PROPERTIES

Temperature	$R_{p0.2}$ (YS 0.2 MPa)	$R_m$ (UTS MPa)	A % (Elongation %)	KCV T (1) J/cm <sup>2</sup>
°C	(YS 0.2 MPa)	(UTS MPa)	(Elongation %)	J/cm <sup>2</sup>
20	> 430	700 - 950	> 35	> 70

(1)  $th = 8 - 12 \text{ mm}$        $KCV > 55 \text{ J/cm}^2$

### Low temperature properties (Typical values)

Temperature	$R_{p0.2}$ (YS 0.2 MPa)	$R_m$ (UTS MPa)	A % (Elongation %)	Young Modulus GPa
°C	(YS 0.2 MPa)	(UTS MPa)	(Elongation %)	GPa
-269 °C	1340	1750	20	213
-196 °C	900	1400	25	-
-78 °C	550	900	30	195

### Fatigue strength

> in air : 250 - 300 N/mm<sup>2</sup>

> sea water (base metal) : 200-250 N/mm<sup>2</sup>

> sea water (welds) : 150 - 200 N/mm<sup>2</sup>

## IN SERVICE CONDITIONS

### CORROSION RESISTANCE

Thanks to its high content in Cr, Mo, N, UR™ 64 has good resistance to :

> intergranular corrosion in the delivery and as weld condition

> pitting corrosion in chloride containing media

> crevice corrosion  
Consult in case of doubt.

## DELIVERY CONDITIONS

### SIZES

Thickness	Width	Length	Weight
≤ 100 mm	up to 3200 mm	up to 12000 mm	up to 6 T

Consult for dimensions as all values are not compatible.

## PLATE PROCESSING

### HEAT TREATMENT

Heating between 1020°C and 1100°C followed by rapid quenching in water. Air cooling can be applied to the thinner products.

### CUTTING

By plasma, or other techniques applicable to stainless steels.

### WELDING

UR™ 64 is welded without preheating nor postheating.

As for all fully austenitic steels, precautions should be taken to limit the risks of hot cracking: controlled heat input and travel speed, filler diameter...

### Welding fillers

> Electrodes :

- Thermanit 20/16 SM
- Fox AM 400

> MIG wire :

- Thermanit 20/16 SM
- Fox AM 400 IG

> Submerged Arc :

- Novonit 3954 + OP76S
- Fox AM 500 UP + OP76S

Consult producers for details.

## PLATE PROCESSING

### FORMING

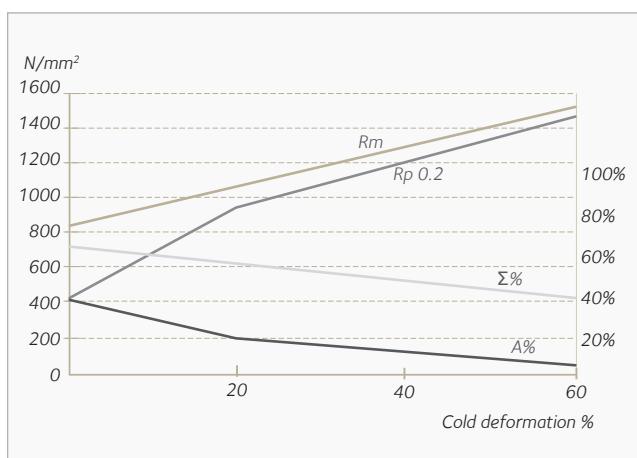
UR™ 64 can be cold or hot formed using the usual precautions for stainless steels.

The relative permeability of UR™ 64 remains low after cold deformations up to 80%.

In the case of hot forming, care must be taken to maintain the mechanical properties : heating before forming and final heat treatment conditions must be studied.

### Surface finishing

UR™ 64 should be cleaned and descaled after welding. Nitric/hydrofluoric acid mixtures (15% HNO<sub>3</sub>, 1% HF) can be used between 20°C and 55°C. Rinse after pickling.



## APPLICATIONS

### Non magnetic steels

Industeel currently delivers non magnetic stainless steels for nuclear physics and military applications. Consult to determine the best available grades.

### Low temperatures

UR™ 64 is also used for the liquid oxygen and hydrogen tanks.

## YOUR CONTACTS

### Sandra Le Manchet

Tel. +33 6 19 72 53 61

[sandra.le-manchet@arcelormittal.com](mailto:sandra.le-manchet@arcelormittal.com)

<https://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.