

NIMET

WHERE
INNOVATION
LIVES



ICT

INDUCTION HARDENED AND CHROME PLATED STEEL TUBES

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ICT

NIMAX ICT - E355+SR
NIMAX ICT - P460N+N
NIMAX ICT - C45E+N
NIMAX ICT - 20MnV6

Extensively used for those applications requiring a high surface hardness and excellent resistance to surface impact (eg. mining equipment).

The surface does not withstand though a high, direct and continuous pressure, but only the one of hydraulic seals.

STEEL GRADES CORRESPONDENTS

EN	Werkstoff	DIN	B.S.	UNI	JIS	GOST	AISI / SAE / ASTM
E355	1.0580	St52	CFS5	Fe510	STKM19A	St6sp	1524 / 1024
P460N	1.8905	StE460	55C	FeE460KG	-	18G2AF	-
C45E	1.1191	Ck45	080M46	C45	S45C	45	1045
-	1.5217	20MnV6	55M	-	-	-	A572

CHEMICAL COMPOSITION - IN % BY WEIGHT

Steel grade	C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu	N
E355	max. 0.22	max. 0.55	max. 1.60	max. 0.025	max. 0.025	-	-	-	-	-	-
P460N	max. 0.20	max. 0.60	1.00 ÷ 1.70	max. 0.025	max. 0.020	max. 0.30	max. 0.10	max. 0.80	max. 0.20	max. 0.70	max. 0.020
C45E*	0.42 ÷ 0.50	max. 0.40	0.50 ÷ 0.80	max. 0.030	max. 0.035	max. 0.40	max. 0.10	-	-	-	-
20MnV6	0.16 ÷ 0.22	0.10 ÷ 0.50	1.30 ÷ 1.70	max. 0.035	max. 0.035	-	-	-	0.08 ÷ 0.20	-	-

*Cr+Mo+Ni = max. 0.63

MECHANICAL PROPERTIES

Steel grade	Tensile strength	Yield point	Elongation (longitudinal)	Impact energy (longitudinal direction)	Hardness ***	Norm
	R _m N/mm ²	R _{p0.2} N/mm ²	A ₅ %	KV ₂ J	Brinell N/mm ²	
E355+SR	min. 580	min. 450	min. 10	(min. 27J / -20°C)**	min. 175	EN 10305-1
P460N+N	560 - 730	min. 460 *	min. 19	min. 40J / -20°C	170 - 220	EN 10216-3
C45E+N	min. 540	min. 340	min. 18	-	min. 163	EN 10305-1
20MnV6+N	550 - 800	min. 450	min. 22	min. 27J / -20°C	165 - 240	Technical data according to internal norm

SR = stress-relieved, N = normalized

* Wall thickness ≤ 12 mm

** On request

*** The hardness values is for information only

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Outside diameter - OD	Ø40 - 125 mm
Inside diameter - ID	see standard dimensions range
Outside tolerance - OD	ISO f7 / ISO f8 / other, on request
Roundness - OD	max. 1/2 from diameter tolerance
Standard lengths	5.000 - 7.500 mm
Special lengths	On request we can offer cut to fix lengths pieces and special lengths
Surface roughness - OD	Ra: max. 0.20 µm
Chrome layer thickness	OD < 20 mm: min. 15 µm OD ≥ 20 mm: min. 20 µm
Chrome layer microhardness	min. 900 HV0.1
Straightness	max. 0.25 mm / 1000 mm

TABLE OF DIMENSIONS OD TOLERANCE

Diameter mm	ISO f7 µm	ISO f8 µm
30 < Ø ≤ 50	-25 / -50	-25 / -64
50 < Ø ≤ 80	-30 / -60	-30 / -76
80 < Ø ≤ 120	-36 / -71	-36 / -90
120 < Ø ≤ 140	-43 / -83	-43 / -106

STANDARD DIMENSIONS RANGE

Outside diameter mm	40	45	50	55	60	63	70	75	80	85	90	100	110	120	125
Inside diameter mm	20	25	30	35	45	43	50	55	50	65	70	80	90	100	100
Wall thickness mm	10	10	10	10	7.5	10	10	10	15	10	10	10	10	10	12.5
	7.5	7.5	7.5	7.5	5	6.5	7.5	-	-	-	-	-	-	-	-

CORROSION RESISTANCE LEVELS

Production	Diameter mm	Mild corrosion resistance NIMAX 120		Medium corrosion resistance NIMAX 200		High corrosion resistance NIMAX 500	
		NSS	AASS	NSS	AASS	NSS	AASS
		rating 9 after 120 h	rating 9 after 48h	rating 9 after 200 h	rating 9 after 80h	rating 9 after 500h	rating 9 after 200h
Regular	Ø ≥ 20	rating 10 after 120 h	rating 10 after 48h	rating 10 after 250 h	rating 10 after 100h	rating 10 after 500h	rating 10 after 200h

Tested in our own laboratory according to ISO 9227, evaluated according to ISO 10289.

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CORRESPONDENCE BETWEEN STEEL GRADE AND SURFACE HARDNESS

	NIMAX ICT E355+SR / P460N+N / 20MnV6	NIMAX ICT C45E+N
Surface hardness beneath the chrome layer	42±4 HRC	58 ±3 HRC

HARDENING DEPTH (SHD)

Diameter	E355+SR / P460N+N / 20MnV6	C45E+N
mm	mm	mm
40	1.0-2.0	1.7-2.3
45	1.3-2.5	1.7-2.3
50 - 80	1.3-2.5	2.2-2.6
85 - 100	2.0-3.0	2.2-3.2
110 - 120	2.0-3.0	2.5-3.5
125	2.0-3.5	2.5-3.5

The hardening depth is defined as the distance from the surface, beneath the chrome layer up to the point where the hardness value has dropped to the value of the steel core hardness, depending on the steel grade.

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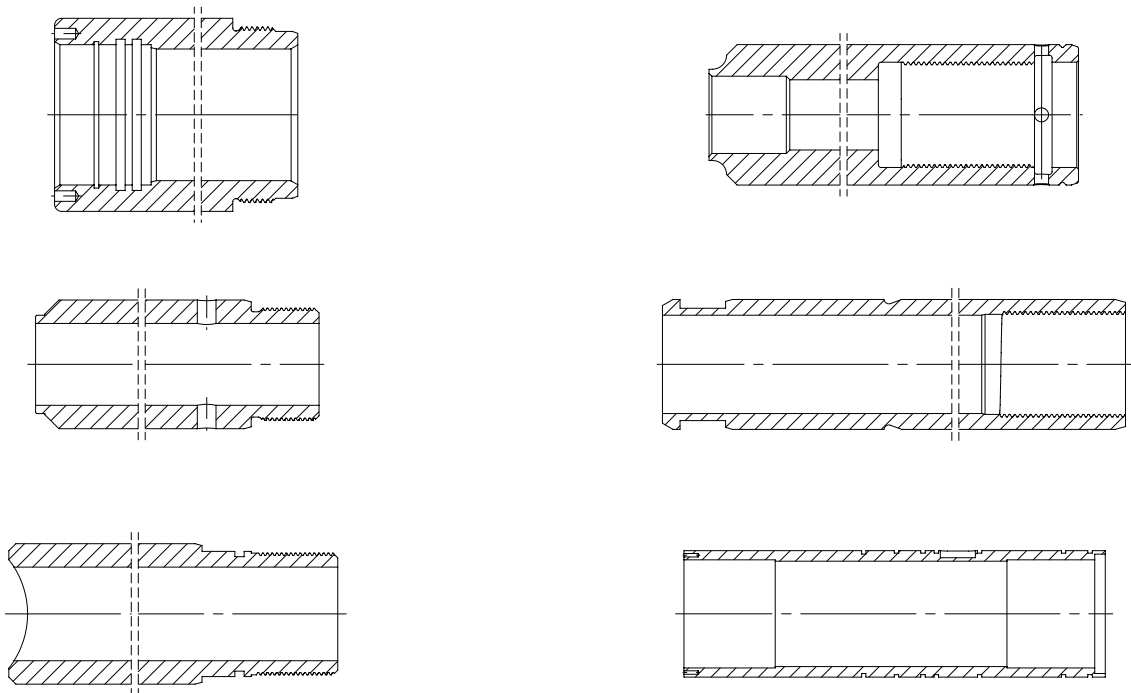
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CUSTOMIZED MACHINING



STORAGE AND HANDLING RECOMMENDATIONS

- Keep the products stored in dry and covered spaces.
- Do not expose for a long time the bars or tubes to the sunlight or to very low temperatures.
- For storage, preferable to use rubber supports or wood lined supports; direct contact with the floor and steel supports that are not lined with soft materials must be avoided.
- Whenever possible, please use the crane to load or unload the bundles; when you use the fork lifts please avoid the direct contact of the forks with the products.
- Always lift the bundles using textile slings. Don't use metal slings during handling of bundles.
- Always keep dry the cardboard tubes that protect the chromed products.



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