NIMET

INCT

INDUCTION HARDENED AND NICKEL-CHROME PLATED STEEL TUBES

TECHNICAL SHEET / NiCro-INCT-TS-2024

INDUCTION HARDENED AND NICKEL-CHROME PLATED STEEL TUBES

NiCro INCT

E355+SR | P460N+N | C45E+N | 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.

INCT

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 [1]	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	-	-

[1] Cr+Mo+Ni = max. 0.63

MECHANICAL PROPERTIES

Steel grade	Tensile strength	Yield point	Elongation (longitudinal)	Impact energy (longitudinal direction)	Hardness [3]	Norm
	R_m	$R_{p0.2}$	A_5	KV_2	Brinell	
	N/mm²	N/mm²	%	J	N/mm²	
E355+SR	min. 580	min. 450	min. 10	(min. 27J / -20°C) [2]	min. 175	EN 10305-1
E355+C	min. 640	min. 540 [4]	min. 4	-	min. 185	EN 10305-2
P460N+N	560 - 730	min. 460 [1]	min. 19	min. 40J / -20°C	170 - 220	EN 10216-3
C45E+N	min. 550	min. 340	min. 18	-	min. 163	EN 10305-1
20MnV6+N	550 - 800	min. 450	min. 20	min. 27J / -20°C	165 - 240	Technical data according to internal norm

SR = stress-relieved, N = normalized, C = cold drawn
[1] Wall thickness ≤ 12 mm
[2] On request
[3] The hardness values is for information only
[4] The Yield Point value 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	5000 - 6400 mm
Special lengths	On request we can offer cut to fix lengths pieces and special lengths up to max. 6.400 mm
Surface roughness - OD	Ra: max. 0.20 µm

	NiCro 150	NiCro 350	NiCro 500
Nickel layer thickness	min. 10 µm	min. 20 µm	min. 30 µm
Chrome layer thickness	min. 20 µm	min. 20 µm	min. 20 µm
Nickel layer microhardness	min. 300 HV0.1		
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
	25	30	35	40	50	50	55	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-

CORRESPONDENCE BETWEEN STEEL GRADE AND SURFACE HARDNESS (INCT)

	NiCro INCT E355+SR / P460N+N /20MnV6	NiCro INCT C45E+N
Surface hardness beneath the chrome layer	42±4 HRC	54 ±3 HRC

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. Generally, the hardening depth is between 1.0 - 3.5 mm, depending on diameter and steel grade.

CORROSION RESISTANCE LEVELS

Diameter mm	NiCro 150		NiCro 350		NiCro 500	
	NSS	AASS	NSS	AASS	NSS	AASS
Ø40 - 125	rating 10 after 500h	rating 10 after 150h	rating 10 after 1000h	rating 10 after 350h	rating 10 after 1500h	rating 10 after 500h

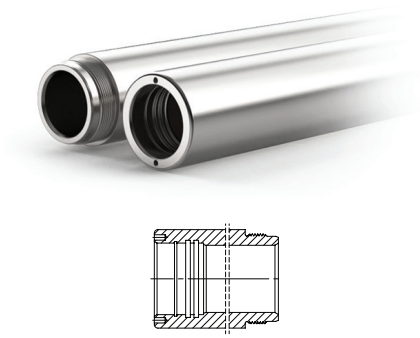
Tested in our own laboratory according to ISO 9227, evaluated according to ISO 10289.

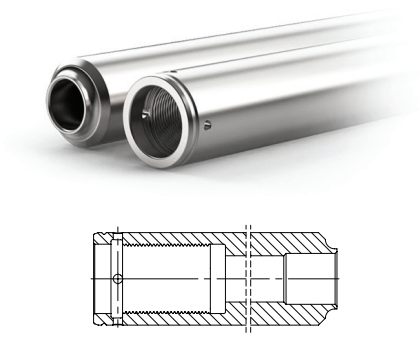
CUSTOMIZED MACHINING

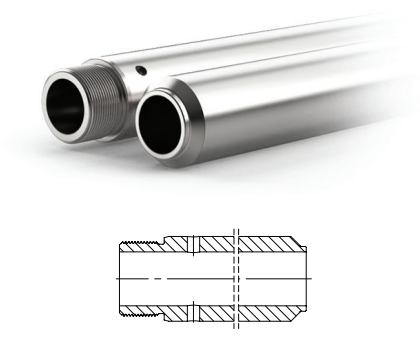
INCT

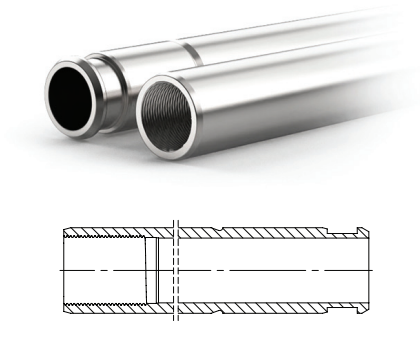
On request we can perform customized cutting and machining according to drawing. We work with the latest technology and our CNC machines can perform high quality turning, milling, threading and drilling.

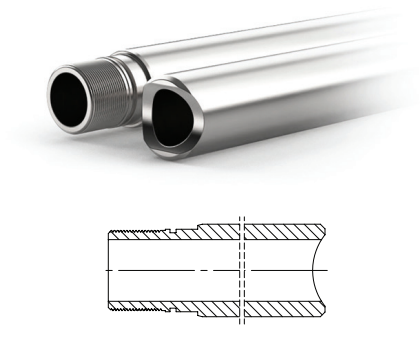
Precision customized parts machined according with customer's drawings: chamfers, inner/outer radius, inner/outer threads, axial/radial holes, inner/outer grooves for seals.

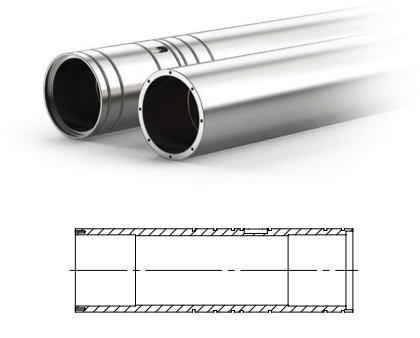




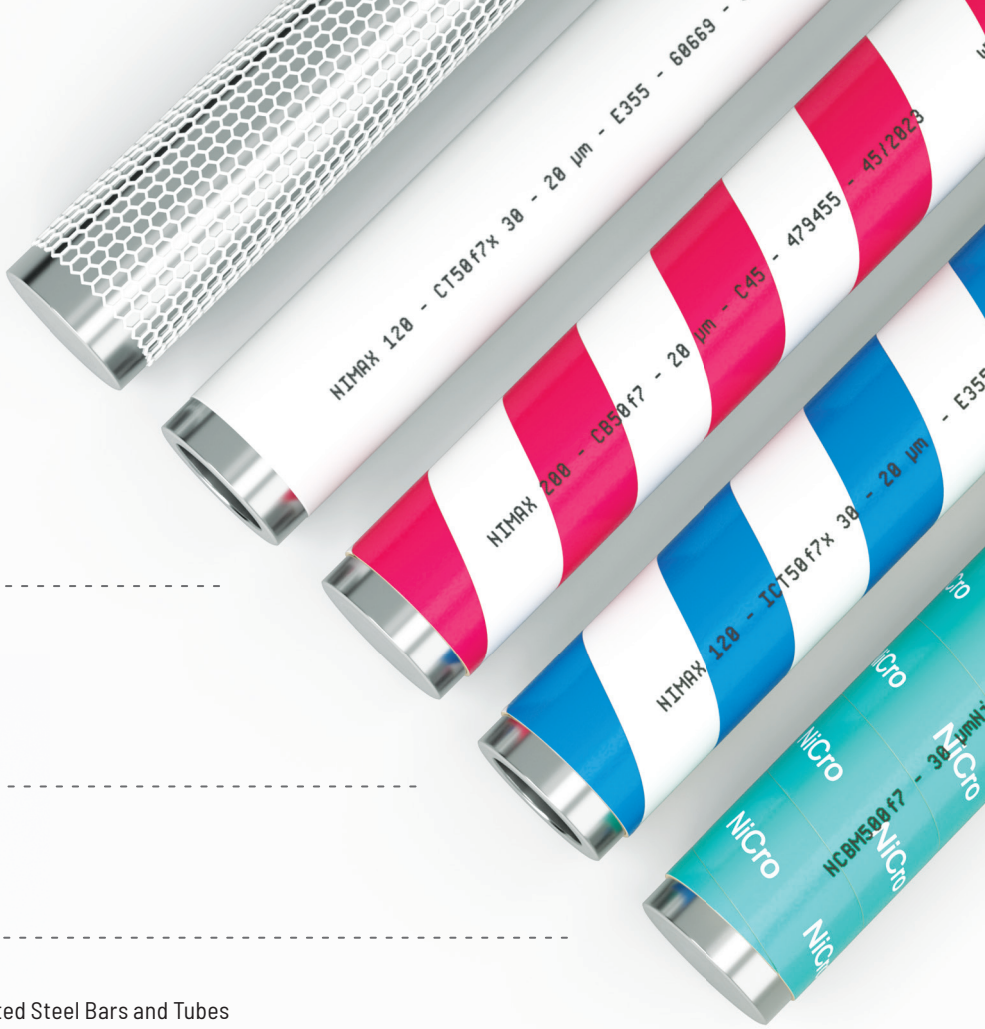








PACKAGING



Plastic Sleeves

WHITE Plastic Sleeves
Ø16 .. 105 mm - Recyclable plastic sleeve.
For sizes less than 16 mm - plastic net,
aluminum bubble foil and wooden cases.

Cardboard Tubes

Chrome Plated Steel Bars and Tubes
RED striped tubes

Induction Hardened and Chrome Plated
Steel Bars and Tubes
BLUE striped tubes

Nickel-Chrome Plated Steel Bars and Tubes
Induction Hardened and Nickel-Chrome Plated Steel Bars and Tubes
GREEN striped tubes

Marking on the cardboard tube or on the plastic sleeve:

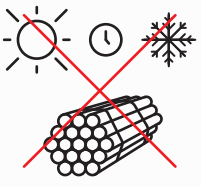
Product Code - Diameter - Tolerance - Chrome layer - Material - Heat Number - Calendar Week/Year - www.nimet.ro

NIMAX 200-CB125f7 - 20µm - C45E - 479455 - 45/2023 - www.nimet.ro

STORAGE & HANDLING

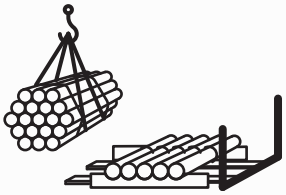
RECOMMENDATIONS

Keep the products stored in dry and covered spaces.

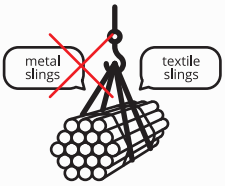


Do not expose the bars or tubes for a long time to the sunlight or to very low temperatures.

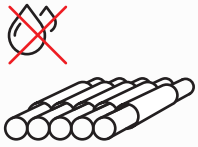
Direct contact with the floor and steel supports that are not lined with soft materials must be avoided; preferable to use rubber or wood lined supports.



Whenever possible, please use the crane to load or unload the bundles; when using the fork lift please avoid the direct contact of the forks with the products.



Always lift the bundles using textile slings. Do not use metal slings during handling of bundles.



Always keep dry the cardboard tubes that protect the chromed products.

NIMET srl

HEADQUARTERS AND PRODUCTION FACILITY 1 / NIMET 1

Targului Street 103, 137121
Lazuri, Dambovita, Romania

PRODUCTION FACILITY 2 / NIMET 2

Laminorului Street 52, 130089
Targoviste, Dambovita, Romania

+40 245 607 000 / office@nimet.ro
WWW.NIMET.RO