

Series	Description
NICRO 1000-NCT	External Nickel and Hard Chrome Plated Steel Tubes with Utmost Corrosion Resistance steel grade: E355, P460N / OD: Ø30 - 140 mm

#### Steel grades correspondents

EN	Werkstoff	DIN	B.S.	UNI	JIS	GOST	AISI SAE ASTM
E355	1.0580	St52	CFS5	Fe510	STKM19A	St6sp	1524
P460N	1.8905	StE460	55C	FeE460KG	-	18G2AF	-

#### 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. 0.040	-	-	-	-	-	-
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

#### Mechanical properties

Steel grade	Tensile strength $R_m$ N/mm <sup>2</sup>	Yield point $R_{p0.2}$ N/mm <sup>2</sup>	Impact energy KV J	Elongation $A_5$ %	Hardness *** Brinell N/mm <sup>2</sup>	Norm
E355+SR	min. 580	min. 450	(27 J / -20° C) **	min. 10	min. 175	EN 10305-1
P460N+N	560 - 730	min. 460 *	27 J / -20° C	min. 19	170 - 220	EN 10216-3

SR = stress-relieved, N = normalized

\* Wall thickness ≤ 12 mm

\*\* on request

\*\*\* The hardness values are for information only

## Nickel and Hard Chrome Plated Steel Tubes

steel grade: E355 / P460N



Series **NICRO 1000-NCT - E355+SR / P460N+N**

Outside diameter - OD	Ø30 - 140 mm
Inside diameter - ID	see Standard dimensions range
Outside tolerance - OD	ISO f7
Roundness - OD	max. 1/2 from diameter tolerance
Standard length	up to 6000 mm / on request: cut lengths
Surface roughness - OD	Ra: max. 0.20 µm
Nickel layer thickness	min. 30 µm
Chrome layer thickness	min. 25 µm
Nickel layer microhardness	min. 300 HV0.1
Chrome layer microhardness	min. 900 HV0.1
Straightness	max. 0.25 mm/1000 mm

- ✓ *Chrome rods corrosion, is always to be considered in the design and the function of the hydraulic cylinders, especially in aggressive conditions.*
- ✓ *The nickel layer is completely free of cracks, pores and by this, the base material is isolated from the atmospheric corrosion, while the chrome layer ensures a very good wear resistance.*
- ✓ *The nickel and chrome plating technology is the solution to extreme environments with intense corrosion:*
  - \* offshore, marine conditions
  - \* military applications, wind, solar and aerospace sector
  - \* agriculture, mining industry, oil and gas industry.

### Table of dimensions - OD tolerance

Diameter mm	ISO f7 µm
Ø = 30	-20 / -41
30 < Ø ≤ 50	-25 / -50
50 < Ø ≤ 80	-30 / -60
80 < Ø ≤ 120	-36 / -71
120 < Ø ≤ 140	-43 / -83

### Standard dimensions range

Outside Diameter mm	30	32	35	40	45	50	55	60	63	65	70	75	80	85	90	100	110	120	140
Inside Diameter mm	15	16	25	20	25	30	35	40	43	45	50	55	60	65	70	80	90	100	120
Wall thickness mm	20	20	20	25	30	35	40	45	53	50	55	60	65	75	75	85	95	-	-
	-	-	-	30	35	40	45	50	-	55	60	65	70	-	80	90	-	-	-
	7.5	8	5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	5	6	7.5	7.5	7.5	7.5	7.5	7.5	5	7.5	7.5	7.5	7.5	5	7.5	7.5	7.5	7.5	-
	-	-	-	5	5	5	5	5	-	5	5	5	5	-	5	5	-	-	-

### Corrosion resistance

Outside Diameter mm	Standard product NICRO 1000-NCT
Ø30 - 140	rating 10 after 1000 h in NSS rating 10 after 350 h in AASS

Tested in our own laboratory according to ISO 9227.  
Evaluated according to ISO 10289.