

Series	Description
<b>NIMAX-ICT</b>	Induction Hardened and External Hard Chrome Plated Steel Tubes steel grade: E355, C45E / OD: Ø45 - 125 mm

### 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

### 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
C45E	0.42 ÷ 0.55	max. 0.40	0.50 ÷ 0.80	max. 0.035	max. 0.035	max. 0.40	max. 0.10	-	-	-	-

### 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
E355+C	min. 640	min. 540	-	min. 4	min. 185	EN 10305-2
P460N+N	560 - 730	min. 460 *	27 J / -20° C	min. 19	170 - 220	EN 10216-3
C45E+N	min. 540	min. 340	-	min. 18	min. 163	EN 10305-1

SR = stress-relieved, N = normalized, C = cold drawn

\* Wall thickness ≤ 12 mm

\*\* on request

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

# Induction Hardened and External Hard Chrome Plated Steel Tubes

steel grade: E355 / C45E



Series **NIMAX 120-ICT - E355+SR / C45E+N**

Outside diameter - OD	Ø45 - 125 mm
Inside diameter - ID	see Standard dimensions range
Outside tolerance - OD	ISO f7 / ISO f8 / other, on request
Standard length	5000 - 7500 mm / on request cut lengths and special lengths
Surface roughness - OD	Ra: max. 0.20 µm
Chrome layer thickness	min. 20 µm
Chrome layer microhardness	min. 900 HV0.1
Straightness	max. 0.25 mm/1000 mm



- ✓ The hard chrome surface of the tubes confers corrosion and wear resistance, reduces friction, improves durability and through abrasion tolerance ensures good oil holding as well.
- ✓ Replaces solid piston rods in systems where the total weight is to be minimized.

- ✓ The hardening is made mainly for conferring a protection of the surface against mechanical strokes or blows (ex. mining equipment constantly stroked by pebbles and dust). The surface does not withstand a high, direct and continuous pressure (like ball bushing), but only seals.

## Table of dimensions - OD tolerance

Diameter mm	ISO f7 µm	ISO f8 µm	Diameter mm	ISO f7 µm	ISO f8 µm
30 < Ø ≤ 50	-25 / -50	-25 / -64	80 < Ø ≤ 120	-36 / -71	-36 / -90
50 < Ø ≤ 80	-30 / -60	-30 / -76	120 < Ø ≤ 125	-43 / -83	-43 / -106

## Standard dimensions range

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

## Correspondence between steel grade and surface hardness

	NIMAX-ICT / E355+SR	NIMAX-ICT / C45E+N
Surface hardness beneath the chrome layer	42±4 HRC	58 ±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.

## Upon request we can provide induction and chrome plated tubes with different levels of corrosion resistance

Diameter mm	Standard product	Medium corrosion resistance	High corrosion resistance
	NIMAX 120-ICT	NIMAX 200-ICT	NIMAX 500-ICT (only on request)
Ø45 - 125	rating 9 after 120 h in NSS	rating 9 after 200 h in NSS	rating 9 after 500 h in NSS

Tested in our own laboratory according to ISO 9227, evaluated according to ISO 10289. On request we can test our products in AASS fog chamber.