

Precision Customized

PISTON RODS

Production

of hard chrome plated bars and tubes,
nickel and chrome plated bars and tubes
for hydraulic lifting, loading and handling
systems





CHROME PLATED STEEL BARS

NIMAX CB / ICB - 50KSI / 75KSI / 100 KSI - C45E

NIMAX CBM / ICBM - 75KSI - 38MnVS6

NIMAX CBV / ICBV - 100KSI - 42CrMo4

CHEMICAL COMPOSITION - IN % BY WEIGHT ACCORDING TO EUROPEAN NORM

Steel grade	European Norm EN	C	Si	Mn	P max.	S	Cr	Mo	Ni max.	Cu max.	V	N	Steel grade ASTM equivalent
C45E	EN ISO 683-1	0.42 ÷ 0.50	0.10 ÷ 0.40	0.50 ÷ 0.80	0.025	max 0.035	max. 0.40	max. 0.10	0.40	0.30	-	-	1045
C50E	EN ISO 683-1	0.47 ÷ 0.55	0.10 ÷ 0.40	0.60 ÷ 0.90	0.025	max 0.035	max. 0.40	max. 0.10	0.40	0.30	-	-	1050
38MnVS6	EN 10267	0.34 ÷ 0.41	0.15 ÷ 0.80	1.20 ÷ 1.60	0.025	0.020 ÷ 0.060	max. 0.30	max. 0.08	-	-	0.08 ÷ 0.20	0.010 ÷ 0.020	10V45
42CrMo4	EN ISO 683-2	0.38 ÷ 0.45	0.10 ÷ 0.40	0.60 ÷ 0.90	0.025	max. 0.035	0.90 ÷ 1.20	0.15 ÷ 0.30	-	0.40	-	-	4140

Dimensions	0.25" - 6.25"
Diameter tolerance	ISO h8 / other, on request
Roundness	max. 1/2 from diameter tolerance
Standard length	18-24 ft / on request, cut and special lengths
Surface roughness	Ra: max. 8 µinch
Chrome layer thickness	min. 0.0005" or min. 0.001" as per customer request
Chrome layer microhardness	min. 900 HV0.1
Straightness	Ø < 0.625": max. 0.0035 inch/ft Ø ≥ 0.625": max. 0.0024 inch/ft
Induction hardened	min. 50 HRC @0.05"

TABLE OF DIMENSIONS TOLERANCE

Diameter mm	ISO h8 µm
6 < Ø ≤ 10	0 / -22
10 < Ø ≤ 18	0 / -27
18 < Ø ≤ 30	0 / -33
30 < Ø ≤ 50	0 / -39
50 < Ø ≤ 80	0 / -46
80 < Ø ≤ 120	0 / -54
120 < Ø ≤ 160	0 / -63

STANDARD DIMENSIONS RANGE

Yield point R _{p0.2} KSI min. N/mm ² min.		Steel grade ASTM	Steel grade EN equivalent	Dimension Ø inch
50	345	1045/1050	C45E/C50E	0.25" - 6.25"
75	517	1045/1045+QT 10V45	C45E 38MnVS6	0.25" - 6.25" 0.75" - 6.25"
100	690	1045/1045+QT 4140+QT	C45E 42CrMo4	0.25" - 6.25" 0.625" - 6.25"

CORROSION RESISTANCE LEVELS

Medium corrosion resistance ASTM B117 ISO 9227 NSS	High corrosion resistance ASTM B117 ISO 9227 NSS	Extreme corrosion resistance ASTM B117 ISO 9227 NSS
NIMAX 200-CB NIMAX 200-CBM NIMAX 200-CBV	NIMAX 500-CB NIMAX 500-CBM NIMAX 500-CBV	NIMAX 1000-CB NIMAX 1000-CBM NIMAX 1000-CBV
Rating 10 after 120 h no corrosion	Rating 10 after 500 h no corrosion	Rating 10 after 1000 h no corrosion

Tested in our own laboratory according to ISO 9227 (ASTM B117),
evaluated according to ISO 10289.





NICKEL-CHROME PLATED STEEL BARS

NiCro NCB / INCB - 50KSI / 75KSI / 100 KSI - C45E

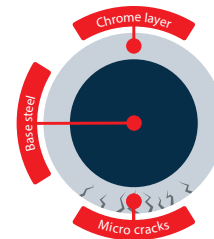
NiCro NCBM / INCBM - 75KSI - 38MnVS6

NiCro NCBV / INCBV - 100 KSI - 42CrMo4+QT

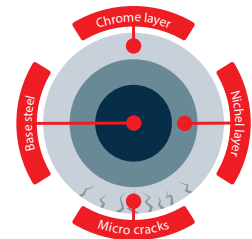
Dimensions	0.75" - 6.25"
Diameter tolerance	ISO h8 / other, on request
Roundness	max. 1/2 diameter tolerance
Standard length	up to 19 ft / on request, cut lengths and special lengths
Surface roughness	max. Ra: 8 µinch
Nickel layer thickness	min. 0.0011"
Chrome layer thickness	min. 0.0010"
Nickel layer microhardness	min. 300HV0.1
Chrome layer microhardness	min. 900HV0.1
Straightness	max. 0.0024 inch/ft
Induction hardened	min. 50 HRC @0.05"

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.

Nickel and Chrome Plated Steel



Chrome Plated Steel



CORROSION RESISTANCE LEVELS

Diameter inch	NiCro 350		NiCro 500	
	ASTM B117 ISO 9227 NSS	ASTM B287 ISO 9227 AASS	ASTM B117 ISO 9227 NSS	ASTM B287 ISO 9227 AASS
Ø 0.75" - 6.25"	rating 10 after 1000h no corrosion	rating 10 after 350h no corrosion	rating 10 after 1500h no corrosion	rating 10 after 500h no corrosion

Tested in our own laboratory according to ISO 9227 (ASTM B117 and ASTM B287), evaluated according to ISO 10289.

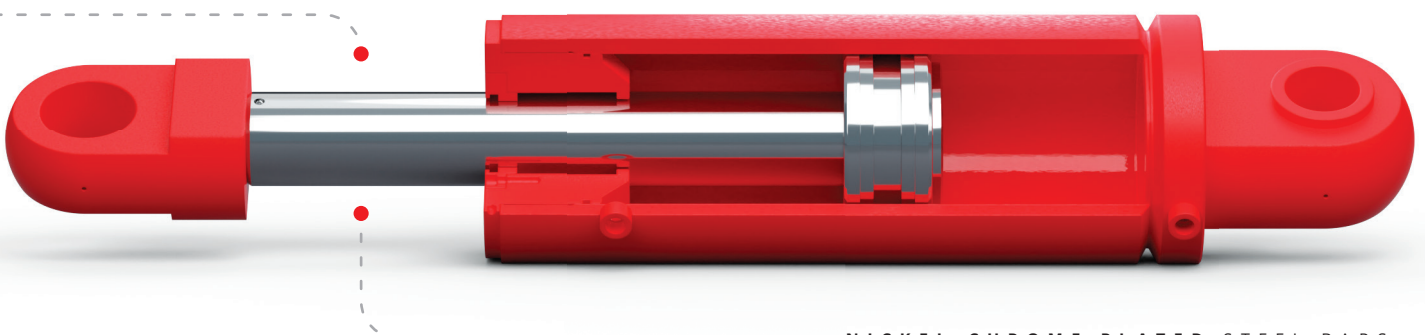
STANDARD DIMENSIONS RANGE

Yield point $R_{p0.2}$ KSI min.		Steel grade ASTM	Steel grade EN equivalent	Dimension Ø inch
50	345	1045/1050	C45E/C50E	0.75" - 6.25"
75	517	1045/1045+QT	C45E	0.75" - 6.25"
		10V45	38MnVS6	0.75" - 6.25"
100	690	1045/1045+QT	C45E	0.75" - 6.25"
		4140+QT	42CrMo4	0.75" - 6.25"

The nickel and chrome plating technology is the solution to extreme environments with intense corrosion:

- ✓ offshore, marine conditions;
- ✓ wind, solar and aerospace sector;
- ✓ agriculture, mining industry, oil and gas industry.

By request, we can produce Nickel-Chrome plated steel tubes.





CHROME PLATED STEEL TUBES

NIMAX CT / ICT - E355+SR

CHEMICAL COMPOSITION - IN % BY WEIGHT ACCORDING TO EUROPEAN NORM

Steel grade	European Norm EN	C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu	N	Steel grade ASTM equivalent
E355	EN 10305-1	max. 0.22	max. 0.55	max. 1.60	max. 0.025	max. 0.025	-	-	-	-	-	-	1024

MECHANICAL PROPERTIES

Steel grade	Tensile strength		Yield point		Elongation (longitudinal)	Impact energy (longitudinal direction)	Hardness **	Norm
	R_m		$R_{p0.2}$		A_5	KV_2	Brinell	
	KSI min.	N/mm ² min.	KSI min.	N/mm ² min.	%	J	N/mm ²	
E355+SR	580	590	65	450 ***	min. 10	(min. 27J / -20°C) *	min. 175	EN 10305-1

SR = stress-relieved

** The hardness values is for information only

* On request

*** On request: min 517 N/ mm² - 75KSI

Outside diameter - OD	Ø0.5"-5.5"
Inside diameter - ID	according to standard dimensions range
Outside tolerance - OD	ISO h8 / other, on request
Roundness - OD	max. 1/2 from diameter tolerance
Standard lengths	18-24 ft/ on request, cut and special lengths
Surface roughness - OD	max. Ra: 8 µinch
Chrome layer thickness	min. 0.0005" or min. 0.001" as per customer request
Chrome layer microhardness	min. 900 HV0.1
Straightness	max. 0.003 inch/ft
Induction hardened	min. 50 HRC @0.05"

CORROSION RESISTANCE LEVELS

Medium corrosion resistance	High corrosion resistance	Extreme corrosion resistance
ASTM B117 ISO 9227 NSS	ASTM B117 ISO 9227 NSS	ASTM B117 ISO 9227 NSS
NIMAX 200-CT	NIMAX 500-CT	NIMAX 1000-CT
Rating 10 after 120 h no corrosion	Rating 10 after 500 h no corrosion	Rating 10 after 1000 h no corrosion

Tested in our own laboratory according to ISO 9227 (ASTM B117), evaluated according to ISO 10289.

CONVERSION TABLE for units of measurement - length

in / inch	x	25.399	=	millimeters / mm
ft / feet	x	304.799	=	millimeters/ mm

CONVERSION TABLE for units of measurement - weight/pressure

lb / pound	x	0.453	=	kilogram / kg
ksi / pound-force / inch ²	x	6.896	=	Mpa = N / mm ²

