NIMET
WHERE INNOVATION LIVES

CHROME PLATED STEEL BARS AND TUBES
Production start-up of chrome plated bars and tubes

Manufacturing of the first nickel-chrome plated bars and tubes

Launching of the first endless chrome plating line

New in-house laboratory investment

Start-up of NIMET 1 & 2

2008
Production start-up of chrome plated bars and tubes

2010
Manufacturing of the first nickel-chrome plated bars and tubes

2012
Launching of the first endless chrome plating line

2013
New in-house laboratory investment

2018
Start-up of NIMET 1 & 2

2020
Facts and figures

Employees: 600
Production capacity: 4,500 tons of chrome plated bars and tubes per month
Founded by a mechanical engineer, as a niche producer of piston rods and tubes for hydraulic lifting, loading and handling systems, NIMET had in the beginning only 10 employees and a production facility of around 500 sqm.

Shortly after the start-up, the Austrian giant, Palfinger, the global market leader in cranes, entered into a joint venture with the Romanian company. In less than 10 years, the small East European manufacturer morphed into one of the most respected industry leaders, with a global presence.
**NIMET** is present in more than 90 countries worldwide, having a well-developed sales network through its distribution partners in all 6 continents.
NIMET has reached in 2018, with the opening of the second factory in Targoviste, a production capacity of over 4,500 tons of chrome plated material each month. Having the necessary resources, the company can further expand in case of increased market demand.

The state of the art technology enables NIMET to respond to both standard commodity requirements as well as customized demands, being always concerned with satisfying its customers’ needs at excellent level of service.
With a skilful team of engineers who designed and built the main production facilities, **NIMET** is innovating continuously. The machines were built tailored to the customers’ needs so that the requirements are satisfied with maximum efficiency. The success lies in flexible automation, being able to switch in an instance from one specification to another.
Working only with selected reputable mills, considered to be the best producers in the world of steel, the raw material is supplied in 100% ultra-sonic and anti-mixture testing conditions.

All manufacturing processes are controlled by automated and active laser measurement systems. Following strict procedures of quality assurance, set by the certified international Management System standards, NIMET is able to ensure a constant and stable production.

All production parameters and results are tested in NIMET’s modern laboratories, successfully contributing to delivering a high-quality product.

Starting with 2017, NIMET has embraced the Lean Kaizen philosophy, its principles currently being implemented throughout all administrative and procedural activities.
QUALITY ASSURANCE

- Engineering and design in accordance with our customers’ requirements.

- Control of surface hardness, Vickers micro hardness, metallography and structural characteristics of the hardened layer, measurements of chrome layer (thickness, number of micro cracks, chrome micro hardness) in our own laboratory.

- Corrosion testing: NSS test, AASS test, CASS test according to ISO 9227 standard or its equivalents, and evaluated according to ISO 10289. Possibility of simultaneous tests by using the spray chambers with automatic setting of testing cycle.

- Control of chemical composition with portable spectrometer.
• Lifting and handling equipment
• Construction machinery
• Earth moving machinery
• Mining equipment
• Agricultural machinery
• Logging and forest control machinery
• Marine and off-shore industry
• Bodybuilding and fitness equipment
• Printing and sorting machinery
• Wind mills and renewable energy systems
• Steel manufacturing industry equipment
• Automotive manufacturing industry equipment
• Shock absorbers and gas springs
• Pneumatic cylinders for medical equipment
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.

CUSTOMIZED MACHINING

- Crosswise Groove
- End for mount with clevis clamp
- Grooves for snap ring
- Reduced diameter with/without feather keyway
- Axial drilled and threaded to ends
- Outside diameter thread
- Tapped or drilled holes radially through shaft
- Radial drilling holes, bored
- Reduced diameter with threaded end
- D-cut shape
PRODUCTS

CHROME PLATED STEEL BARS

CB
CHROME PLATED STEEL BARS

ICB
INDUCTION HARDENED AND CHROME PLATED STEEL BARS

NCB
NICKEL-CHROME PLATED STEEL BARS

INCB
INDUCTION HARDENED AND NICKEL-CHROME PLATED STEEL BARS

CBX
CHROME PLATED STAINLESS STEEL BARS
In choosing the right product for an application, there are certain aspects to be taken into consideration. Both the properties of the base material and those of the finished surface are of crucial importance in delivering the optimum solution. The questions to be answered in making the correct decision are:

- What is the product that best fits the application's function and its technical requirements?
- What is the most cost-effective solution?
- What is the product with the least long-term impact on the environment?

**MECHANICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Yield point Rm N/mm²</th>
<th>Tensile strength Rm N/mm²</th>
<th>Elongation A5 %</th>
<th>Impact energy min. J / °C</th>
<th>Hardness Brinell *</th>
<th>Norm</th>
</tr>
</thead>
</table>

**CHEMICAL COMPOSITION - IN % BY WEIGHT**

- **Steel grade**
  - C: 0.16-0.18, Si: 0.15-0.35, Mn: 1.05-1.90, P: 0.02-0.05, S: 0.01-0.05
  - Cr: 18-19, Mo: 0.35-0.50, Ni: 7.00-9.00, Cu: 0.50-1.00
- **Chemical composition**
  - C: 0.16-0.18, Si: 0.15-0.35, Mn: 1.00-1.35, P: 0.01-0.03, S: 0.01-0.03
  - Cr: 18-19, Mo: 0.08-0.12, Ni: 5.00-7.00

**STEEL GRADES CORRESPONDENTS**

<table>
<thead>
<tr>
<th>Steel grade</th>
<th>C</th>
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<tr>
<td>C35E *</td>
<td>0.32 ÷ 0.39</td>
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<td>max. 0.025</td>
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CHROME PLATED STEEL BARS

The hard chromium surface of the bars ensures corrosion and wear resistance and improved ductility. Commonly used in non-aggressive environments, for rods not exposed to mechanical strokes.

INDUCTION HARDENED AND CHROME PLATED STEEL BARS

Extremely used for those applications requiring a high surface hardness and excellent resistance to surface impacting, mining equipment.

Offering greater strength and resistance to mechanical stresses, coupled with good wear resistance, the induction hardened and chrome platted steel bars are characterized by an extremely smooth surface finish, granting as well an excellent wear and corrosion resistance.

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

NICKEL-CHROME PLATED STEEL BARS

Nickel-chrome plated steel bars offer superior resistance when exposed to aggressive environments.

Our solution in this case: nickel-chrome plating, a process meant to give products more durability even in high-salt, high-temperature and those saturated with aggressive materials.

The nickel and chrome plating technology is the solution to extreme environments with intense corrosion: offshore, marine conditions, military applications, water, coke and petrochemical sectors, agriculture, mining industry, oil and gas industry.

INDUCTION HARDENED AND NICKEL-CHROME PLATED STEEL BARS

The hardening is used mainly for conferring a protection of the surface against mechanical strokes.

The hardening ensures high durability through the high, direct and continuous pressure, but only the one of hydraulic seals.

CHROME PLATED STAINLESS STEEL BARS

Obtained through a chrome plating process over a stainless steel base material, this product not only satisfies certain oxidation resistance requirements, given by the stainless steel base material, but also different mechanical demands.

Granting higher corrosion resistance, generally used in automotive, food and pharmaceutical industries, the stainless steel grades with higher nickel content provide a good impact resistance even after tempered treatment (18/10).

CORROSION RESISTANCE LEVELS

The nickel layer is completely free of cracks, pores and sub-surface inclusions.

The base material is isolated from the aggressive environment.

The hard chromed surface of the bars ensures corrosion and wear resistance and improved ductility.

Commonly used in non-aggressive environments, for rods not exposed to mechanical strokes.

The nickel layer is completely free of cracks, pores and sub-surface inclusions.

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CORROSION RESISTANCE LEVELS

<table>
<thead>
<tr>
<th>Diameter</th>
<th>NIMAX CBX W1.4021 (AISI 420)</th>
<th>NIMAX CBX W1.4057 (AISI 431)</th>
<th>NIMAX CBX W1.4301 (AISI 304)</th>
<th>NIMAX CBX W1.4401 (AISI 316)</th>
<th>NIMAX CBX W1.4542 (AISI 630)</th>
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</thead>
<tbody>
<tr>
<td>Ø6 - 100</td>
<td>NSS</td>
<td>NSS</td>
<td>NSS</td>
<td>NSS</td>
<td>NSS</td>
</tr>
<tr>
<td></td>
<td>rating 9 after 200 h</td>
<td>rating 9 after 500 h</td>
<td>rating 9 after 1200 h</td>
<td>rating 9 after 1000 h</td>
<td>rating 9 after 1450 h</td>
</tr>
</tbody>
</table>

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

TABLE OF DIMENSIONS TOLERANCE

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>ISO Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø = 6</td>
<td>-10 / 22</td>
</tr>
<tr>
<td>6 &lt; Ø ≤ 10</td>
<td>-13 / 28</td>
</tr>
<tr>
<td>10 &lt; Ø ≤ 18</td>
<td>-16 / 34</td>
</tr>
<tr>
<td>18 &lt; Ø ≤ 30</td>
<td>-20 / 41</td>
</tr>
<tr>
<td>30 &lt; Ø ≤ 50</td>
<td>-25 / 50</td>
</tr>
<tr>
<td>50 &lt; Ø ≤ 80</td>
<td>-30 / 60</td>
</tr>
<tr>
<td>80 &lt; Ø ≤ 100</td>
<td>-36 / 71</td>
</tr>
</tbody>
</table>

Dimensions Ø6 - 100 mm / Ø1/4" - 4"

Diameter tolerance: ISO T7 / other, on request

Roundness: max. 1/2 from diameter tolerance

Standard lengths: 3.000 - 6.000 mm

Special lengths: On request we can offer cut to fix lengths pieces

Surface roughness: Ra: max. 0.20 μm

Chrome layer thickness: Ø ≤ 20 mm: min. 15 μm

Chrome layer microhardness: min. 900 HV0.1

Straightness: Ø ≤ 16 mm: max. 0.3 mm/1000 mm

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PRODUCTS

CHROME PLATED STEEL TUBES

CT
CHROME PLATED STEEL TUBES

ICT
INDUCTION HARDENED AND CHROME PLATED STEEL TUBES

TL
CHROME PLATED TELESCOPIC STEEL TUBES

CTI
INTERNAL CHROME PLATED STEEL TUBES

NCT
NICKEL-CHROME PLATED STEEL TUBES

INCT
INDUCTION HARDENED AND NICKEL-CHROME PLATED STEEL TUBES
MECHANICAL PROPERTIES

Steel grade | Tensile strength | Yield point | Elongation (longitudinal) | Impact energy (longitudinal) | Hardness *** | Norm
---|---|---|---|---|---|---
E355 | Rm min. 580 | min. 450 | min. 10 | (min. 27J / 20°C)** | min. 175 | EN 10305-1
P460N | Rm min. 640 | min. 540 **** | min. 4 | - | min. 185 | EN 10305-2
C45E | 560 - 730 | min. 460 * | min. 10 | min. 40J / 20°C | 170 - 220 | EN 10216-3
C45E+N | min. 540 | min. 340 | min. 18 | - | min. 163 | EN 10305-1
20MnV6 | 550 - 800 | min. 450 | min. 22 | min. 27J / 20°C | 165 - 240 | Technical data according to internal norm

* SR = stress-relieved, N = normalized, C = cold drawn
** Wall thickness ≥ 12 mm
*** The hardness values is for information only
**** On request
***** The yield point value is for information only

CHROME PLATED STEEL TUBES

Induction hardened and chrome plated steel tubes

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. 0.80 | 1.00 ÷ 1.70 | max. 0.020 | max. 0.30 | max. 0.80 | max. 0.20 | max. 0.70 | max. 0.20 | - | -
C45E | 0.43 ÷ 0.50 | max. 0.40 | 0.50 ÷ 0.80 | max. 0.030 | max. 0.40 | max. 0.10 | - | - | - | - | 0.08 ÷ 0.20

STEEL GRADES CORRESPONDENTS

| EN | Werkstoff | DIN | B.S. | UNI | JIS | GOST | AISI / SAE / ASTM |
---|---|---|---|---|---|---|---|
E355 | 1.0580 | St52 | CF55 | Fe510 | STKM19A | St5sp | 1524 / 1024
P460N | 1.8905 | SIE460 | 5SC | FeE460KGS | - | 1852AF | -
C45E | 1.1191 | CK45 | 080M46 | C45 | S45C | 45 | 1045

STEEL SPECIFICATIONS

- Wall thickness ≤ 12 mm
- ** On request
- *** The hardness values is for information only
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MECHANICAL PROPERTIES

Steel grade | Tensile strength | Yield point | Elongation (longitudinal) | Impact energy (longitudinal) | Hardness *** | Norm
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** Wall thickness ≥ 12 mm
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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.

### TABLE OF DIMENSIONS OD TOLERANCE

<table>
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<tr>
<th>Diameter mm</th>
<th>ISO f7 μm</th>
<th>ISO f8 μm</th>
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<tbody>
<tr>
<td>30 ≤ Ø ≤ 50</td>
<td>-25 / -50</td>
<td>-25 / -64</td>
</tr>
<tr>
<td>50 ≤ Ø ≤ 80</td>
<td>-30 / -60</td>
<td>-30 / -76</td>
</tr>
<tr>
<td>80 ≤ Ø ≤ 120</td>
<td>-36 / -71</td>
<td>-36 / -90</td>
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<tr>
<td>120 ≤ Ø ≤ 140</td>
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<td>-43 / -106</td>
</tr>
</tbody>
</table>

### STANDARD DIMENSIONS RANGE

<table>
<thead>
<tr>
<th>Outside diameter - OD</th>
<th>ISO f7</th>
<th>ISO f8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø40 - 125 mm</td>
<td>-25 / -50</td>
<td>-25 / -64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inside diameter - ID</th>
<th>ISO H8</th>
<th>ISO H9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø20 min.</td>
<td>0 / +39</td>
<td>0 / +62</td>
</tr>
<tr>
<td>Ø20 min.</td>
<td>0 / +46</td>
<td>0 / +74</td>
</tr>
<tr>
<td>Ø20 min.</td>
<td>0 / +54</td>
<td>0 / +87</td>
</tr>
<tr>
<td>Ø20 min.</td>
<td>0 / +63</td>
<td>0 / +100</td>
</tr>
<tr>
<td>Ø20 min.</td>
<td>0 / +72</td>
<td>0 / +115</td>
</tr>
</tbody>
</table>

### CORRESPONDENCE BETWEEN STEEL GRADE AND SURFACE HARDNESS

<table>
<thead>
<tr>
<th>NIMAX ICT E355+SR / P460N+N / 20MnV6</th>
<th>NIMAX ICT C45E+N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface hardness beneath the chrome layer</td>
<td>42 ± x HRC</td>
</tr>
</tbody>
</table>

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

### CORROSION RESISTANCE LEVELS

<table>
<thead>
<tr>
<th>Production</th>
<th>Diameter mm</th>
<th>Mild corrosion resistance</th>
<th>Medium corrosion resistance</th>
<th>High corrosion resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NIMAX 120</td>
<td>NIMAX 200</td>
<td>NIMAX 500</td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>NSS AASS</td>
<td>NSS AASS</td>
<td>NSS AASS</td>
<td></td>
</tr>
<tr>
<td>Ø ≥ 20</td>
<td>rating 9</td>
<td>rating 9</td>
<td>rating 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>after 120 h</td>
<td>after 200 h</td>
<td>after 500 h</td>
<td></td>
</tr>
<tr>
<td>Special</td>
<td>Ø ≥ 20</td>
<td>rating 9</td>
<td>rating 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>after 120 h</td>
<td>after 250 h</td>
<td>after 500 h</td>
<td></td>
</tr>
</tbody>
</table>

### CHROME PLATED TELESCOPIC STEEL TUBES

<table>
<thead>
<tr>
<th>Diameter mm</th>
<th>NIMAX 120</th>
<th>NIMAX 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø ≥ 20</td>
<td>NSS AASS</td>
<td>NSS AASS</td>
</tr>
<tr>
<td></td>
<td>rating 9</td>
<td>rating 9</td>
</tr>
<tr>
<td></td>
<td>after 120 h</td>
<td>after 200 h</td>
</tr>
</tbody>
</table>

Tested in our own laboratory according to ISO 9227, evaluated according to ISO 10289.
### STANDARD DIMENSIONS RANGE

<table>
<thead>
<tr>
<th>Outside diameter (mm)</th>
<th>80</th>
<th>90</th>
<th>105</th>
<th>110</th>
<th>115</th>
<th>125</th>
<th>145</th>
<th>150</th>
<th>160</th>
<th>165</th>
<th>170</th>
<th>175</th>
<th>190</th>
<th>195</th>
<th>210</th>
<th>216</th>
<th>225</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside diameter (mm)</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>95</td>
<td>100</td>
<td>110</td>
<td>125</td>
<td>120</td>
<td>135</td>
<td>140</td>
<td>145</td>
<td>150</td>
<td>160</td>
<td>160</td>
<td>180</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Wall thickness (mm)</td>
<td>5</td>
<td>5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>10</td>
<td>15</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>8</td>
<td>12.5</td>
</tr>
</tbody>
</table>

* Other dimensions on request

### TABLE OF DIMENSIONS ID TOLERANCE

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>ISO H8</th>
<th>ISO H9</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 - Ø5 x 80</td>
<td>0 / +46</td>
<td>0 / +74</td>
</tr>
<tr>
<td>80 - Ø5 x 120</td>
<td>0 / +54</td>
<td>0 / +87</td>
</tr>
<tr>
<td>120 - Ø3 x 180</td>
<td>0 / +63</td>
<td>0 / +100</td>
</tr>
<tr>
<td>180 - Ø3 x 200</td>
<td>0 / +72</td>
<td>0 / +115</td>
</tr>
</tbody>
</table>

### TABLE OF DIMENSIONS OD TOLERANCE

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>ISO f7</th>
<th>ISO f8</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - Ø5 x 10</td>
<td>-20 / -41</td>
<td>-20 / -53</td>
</tr>
<tr>
<td>30 - Ø5 x 50</td>
<td>-25 / -50</td>
<td>-25 / -64</td>
</tr>
<tr>
<td>50 - Ø5 x 80</td>
<td>-30 / -60</td>
<td>-30 / -76</td>
</tr>
<tr>
<td>80 - Ø5 x 120</td>
<td>-36 / -71</td>
<td>-36 / -90</td>
</tr>
<tr>
<td>120 - Ø3 x 140</td>
<td>-43 / -83</td>
<td>-43 / -106</td>
</tr>
</tbody>
</table>

### CORROSION RESISTANCE LEVELS

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>NiCrO 150</th>
<th>NiCrO 350</th>
<th>NiCrO 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø30 - 140</td>
<td>NSS</td>
<td>AASS</td>
<td>NSS</td>
</tr>
</tbody>
</table>
| Test: In our own laboratory according to ISO 9227; evaluated according to ISO 10289.
CORROSION RESISTANCE LEVELS

<table>
<thead>
<tr>
<th>Diameter</th>
<th>NiCro 150</th>
<th>NiCro 350</th>
<th>NiCro 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø30 – 125</td>
<td>NSS</td>
<td>NSS</td>
<td>NSS</td>
</tr>
<tr>
<td>Ø40 – 300</td>
<td>AASS</td>
<td>AASS</td>
<td>AASS</td>
</tr>
<tr>
<td>Ø40 – 700</td>
<td>NSS</td>
<td>AASS</td>
<td>NSS</td>
</tr>
</tbody>
</table>

Tested in our own laboratory according to ISO 9227, evaluated according to ISO 10289.
WELDED COLD DRAWN TUBES, INSIDE SMOOTH AS DRAWN OR HONED OR SKIVED AND ROLLER BURNISHED

CYLINDER TUBES, INSIDE HONED OR SKIVED AND ROLLER BURNISHED

H8

H9

WELDED COLD DRAWN TUBES, INSIDE SMOOTH AS DRAWN OR HONED

PRODUCTS

CYLINDER TUBES

FOR HIDRAULIC APPLICATIONS
Cylinder steel tubes are suitable for a variety of hydraulic cylinders, where tight tolerances and smooth surface finishing are critical. Tubes either honed or skived and roller burnished are mainly characterized by a precise inside processed surface resulting into a superior finished product.

The skiving and roller burnishing production technique refers to a process consisting in micro-finishing metallic internal tube surfaces. The resulted effect is a mirror surface finish with technical roughness advantages.

Producing cylinder tubes by honing results in having a cross-grinding pattern. The tubes in this case present an improved inside straightness. The very precise and smooth surface reduce friction negative effects and extends the life of the cylinder’s components.

A good roundness and a high ID precision are achieved during the cold drawing process of the welded tubes, so called “ready to use” or ready for the assembly of hydraulic and pneumatic cylinders.

Additionally, the tubes can be honed, conferring the inside surface a better precision. The special texture obtained permits oil storage and helps the system to work properly and well lubricated, even after a long period of inactivity.
Nowadays, the market is more demanding and requires a high level of service which we are ready to sustain with solutions to the customers needs:
- materials with particular characteristics (chemical composition, mechanical properties, hardening parameters, surface finishing);
- special lengths and cutting to specific lengths;
- technical support;
- custom finished or semi-finished products based on the customer’s drawing or our own design.
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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NIMET.RO