Bars
Nickel, Nickel-based and Copper-Nickel Alloys
Nowadays we produce the following innovative and approved Alloys in our integrated factory:

› Pure Nickel (Ni)
› High temperature resistant Nickel alloys (NiCrFe)
› Corrosion resistant Nickel alloys (NiCrMo, NiCu)
› Controlled expansion alloys (NiFe, FeNi)
› Resistance alloys (CuNi)
› Soft-magnetic alloys (FeNi)

We melt alloys in our IF, VAC and VIDP furnaces and subsequent ESR refining processes can be employed for the most critical alloys. The ingots are then hot-worked by rolling, forging, followed by mechanical finishing such as peeling, turning, or cold working on one of our draw benches. According to customer request, we can employ special heat treatment procedures, drawing, straightening and sawing to length to achieve particular dimensions and tolerances. You also have the opportunity to specify both standard as well as modified chemical analyses.

Take advantage of our:

› Flexibility
we can offer low mill production order quantities

› Quality control
throughout the entire production process

› Individuality
we can manufacture a wide range of dimensions with tight tolerances

› Close customer relationships
thanks to our lean and flat company structure and worldwide presence

› Competence
due to the Know How of our experienced staff

› Problem solving
together we will help develop entirely new products

Raising the Bar...
...for your perfect solution

Tradition meets today. 150 years of experience

The history of Deutsche Nickel stretches all the way back to 1861. In 1878 the founder of our company Theodor Fleitmann made the pioneering discovery that the addition of Magnesium to the production process meant that Nickel could now be hot-rolled and forged. Even today, this ground-breaking discovery still forms the basis of manufacturing processes throughout the Nickel processing Industry.

Nowadays we produce the following innovative and approved Alloys in our integrated factory:

› Pure Nickel (Ni)
› High temperature resistant Nickel alloys (NiCrFe)
› Corrosion resistant Nickel alloys (NiCrMo, NiCu)
› Controlled expansion alloys (NiFe, FeNi)
› Resistance alloys (CuNi)
› Soft-magnetic alloys (FeNi)

We melt alloys in our IF, VAC and VIDP furnaces and subsequent ESR refining processes can be employed for the most critical alloys. The ingots are then hot-worked by rolling, forging, followed by mechanical finishing such as peeling, turning, or cold working on one of our draw benches. According to customer request, we can employ special heat treatment procedures, drawing, straightening and sawing to length to achieve particular dimensions and tolerances. You also have the opportunity to specify both standard as well as modified chemical analyses.

Take advantage of our:

› Flexibility
we can offer low mill production order quantities

› Quality control
throughout the entire production process

› Individuality
we can manufacture a wide range of dimensions with tight tolerances

› Close customer relationships
thanks to our lean and flat company structure and worldwide presence

› Competence
due to the Know How of our experienced staff

› Problem solving
together we will help develop entirely new products

Best in Nickel – Deutsche Nickel

Deutsche Nickel is your high quality manufacturer of Nickel, Nickel-based, Copper-Nickel, Iron-Nickel Wire, Bar and Forged products, as well as corresponding raw material alloys for Strip and Plate production. In our Melt Shop, we utilize various melting technologies to produce superior customized melting solutions, which can then be further processed through hot and cold-working operations to produce semi-finished products as per our customers’ requirements. A broad range of industries has long valued the capabilities of our integrated Production, our typical mid-size industrial company mentality, our innovation strengths and above all, our flexibility, which can help you gain that all-important competitive advantage in your market-place. Please read on...

Made in Germany – worldwide

We produce a multitude of different alloys with their own individual properties at our logistically perfect location in the Ruhr valley, the core of Germany’s industrial heartland. We support a network of Sales, Distribution and Service centers in Europe, America and Asia and use these to offer short lead-times, quick responses and close contact with our customers. We can also promise a high level of Sales and Technical support to assist in the selection of materials for your applications.
On fire
New solutions –
for the challenges of tomorrow

The Nickel and Nickel alloys from Deutsche Nickel are the raw materials of choice, whenever technology demands the highest standards.

Deutsche Nickel’s production program in bar products consists of both cold-drawn, as well as hot worked bars in the size range 6.35 – 450 mm in various shapes and conditions (round, square, rectangular and hexagonal). These products are used in a wide range of industries. Valve shafts, ball valves, screws, nuts, rods and bolts in cold and hot-heading quality are just a few of the many critical components used in industries such as turbine, valve, reactor and chemical plant construction. Our strength is in finding lasting solutions to the individual demands of our customers throughout a wide range of industries.

Cold drawn:
Ø 6.35 - 88.9 mm*
1/4” - 3 1/2”
Hot worked:
Ø 20 - 450 mm*
3/4” - 17 3/4”

Cold drawn:
6.35 - 35.0 mm*
1/4” - 1 1/4”
Hot worked:
20 - 450 mm*
3/4” - 17 3/4”

Cold drawn:
Width: 15 - 35 mm
5/8” - 1 3/8”
Thickness: 4.0 - 12.7 mm*
3/16” - 1/2”
Hot worked: on request

Cold drawn:
6.35 - 69.85 mm A/F
1/4” - 2 3/4”

* depending on alloy

Oil & Gas

High strength Alloys 500, 625, 718

Corrosion resistant Alloys C 4, C 276, C 22, 625, 200/201, 400

Forging Billet

Alloys 400, C 276, 200/201, 600, 625 for further hot working

Furnaces

Heat-resistant Alloys 600 and 601

Electronics

W48, Ni36M, Ni36, Ni42 and NiCo 29/18 for either soft-magnetic, or controlled expansion applications

Distribution & Service

The entire production program in the most popular standard sizes and condition
# Nickel Alloys

<table>
<thead>
<tr>
<th>Alloy</th>
<th>DN Trade Name</th>
<th>Material No.</th>
<th>UNS</th>
<th>Specifications</th>
<th>Approx. chem. analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>R-Nickel 99.2</td>
<td>2.4066</td>
<td>N02200</td>
<td>ASTM B160</td>
<td>Ni min. 99.2%</td>
</tr>
<tr>
<td>201</td>
<td>NR-Nickel 99</td>
<td>2.4068</td>
<td>N02201</td>
<td>ASTM B160</td>
<td>Ni min. 99.0%, C max. 0.02%</td>
</tr>
<tr>
<td>99.6</td>
<td>BR-Ni 99.6</td>
<td>2.4060</td>
<td></td>
<td>DIN 17740</td>
<td>Ni min. 99.6%</td>
</tr>
<tr>
<td>LC-Ni 99.6</td>
<td>NR-Nickel 99.6</td>
<td>2.4061</td>
<td></td>
<td>DIN 17740</td>
<td>Ni min. 99.6%, C max. 0.02%</td>
</tr>
</tbody>
</table>

# Nickel-Chrome-Iron Alloys

<table>
<thead>
<tr>
<th>Alloy</th>
<th>DN Trade Name</th>
<th>Material No.</th>
<th>UNS</th>
<th>Specifications</th>
<th>Approx. chem. analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>Silverin 400</td>
<td>2.4360</td>
<td>N04400</td>
<td>ASTM B164 / ASTM B564 QQN 281</td>
<td>Ni 64%, Cu 32%, Fe 2%, Mn 1.2%</td>
</tr>
<tr>
<td>405</td>
<td>Silverin 405</td>
<td>2.4363</td>
<td>N04405</td>
<td>ASTM B164 QQN 281</td>
<td>Ni 64%, Cu 32%, Fe 1.5%, Mn 1.9%, S 0.04%</td>
</tr>
<tr>
<td>K500</td>
<td>Silverin 500</td>
<td>2.4375</td>
<td>N05500</td>
<td>ASTM B865 QQN 286</td>
<td>Ni 65%, Cu 30%, Al 3%, Fe 0.8%, Ti 0.5%</td>
</tr>
</tbody>
</table>

# Nickel-Copper Alloys

<table>
<thead>
<tr>
<th>Alloy</th>
<th>DN Trade Name</th>
<th>Material No.</th>
<th>UNS</th>
<th>Specifications</th>
<th>Approx. chem. analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>Ferrochronin 600</td>
<td>2.4816</td>
<td>N06600</td>
<td>ASTM B564 / ASTM B166</td>
<td>Ni 74%, Cr 16%, Fe 9%</td>
</tr>
<tr>
<td>601</td>
<td>Ferrochronin 601</td>
<td>2.4851</td>
<td>N06601</td>
<td>ASTM B166</td>
<td>Ni 61%, Cr 23%, Fe 14%, Al 1.4%</td>
</tr>
</tbody>
</table>

# Nickel-Chrome Alloys

<table>
<thead>
<tr>
<th>Alloy</th>
<th>DN Trade Name</th>
<th>Material No.</th>
<th>UNS</th>
<th>Specifications</th>
<th>Approx. chem. analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 4</td>
<td>Chronin C 4</td>
<td>2.4610</td>
<td>N06455</td>
<td>ASTM B574</td>
<td>Ni 67%, Cr 16%, Mo 16%, Ti 0.5%</td>
</tr>
<tr>
<td>C 22</td>
<td>Chronin C 22</td>
<td>2.4602</td>
<td>N06022</td>
<td>ASTM B574</td>
<td>Ni 57%, Cr 21.5%, Mo 13.5%, Fe 4%, W 3.5%</td>
</tr>
<tr>
<td>C 276</td>
<td>Chronin C 276</td>
<td>2.4819</td>
<td>N10276</td>
<td>ASTM B574 / ASTM B164</td>
<td>Ni 58%, Mo 16%, Cr 16%, Fe 6%, W 4%</td>
</tr>
<tr>
<td>625</td>
<td>Chronin 625</td>
<td>2.4856</td>
<td>N06625</td>
<td>ASTM B446</td>
<td>Ni 60%, Cr 22%, Mo 9%, Fe 4%, Nb 3.5%, Ti 0.3%</td>
</tr>
<tr>
<td>718</td>
<td>Chronin 718</td>
<td>2.4668</td>
<td>N07718</td>
<td>ASTM B637</td>
<td>Ni 54%, Fe 18%, Cr 18.5%, Nb 5%, Mo 3%, Ti 1%</td>
</tr>
</tbody>
</table>

---

* This alloy can be supplied with a slightly modified chemical analysis as soft-magnetic alloy Dilaton 36M, in accordance with Material No. 1.3911 and DIN 17745.

** This alloy can be supplied with a slightly modified chemical analysis as soft-magnetic alloy W48, in accordance with DIN 17745.
### Supply Forms

<table>
<thead>
<tr>
<th>Condition</th>
<th>Dimensions*</th>
</tr>
</thead>
<tbody>
<tr>
<td>cold drawn</td>
<td>round bars max. 88.9 mm / 3 1/2&quot;</td>
</tr>
<tr>
<td></td>
<td>hexagonal bars max. 69.85 mm A/F / 2 3/4&quot;</td>
</tr>
<tr>
<td></td>
<td>square bars max. 35 mm / 1 3/8&quot;</td>
</tr>
<tr>
<td>hot worked</td>
<td>20 - 450 mm / 3/4&quot; - 17 3/4&quot;</td>
</tr>
<tr>
<td></td>
<td>turned / peeled +0.78 / -0.0 mm</td>
</tr>
<tr>
<td></td>
<td>+0.031&quot; / -0.0&quot; (ground)</td>
</tr>
</tbody>
</table>

* depending on Alloy

### Dimensions*

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Dimensions (mm)</th>
<th>Dimensions (inch)</th>
<th>Min. production quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silverin 400</td>
<td>7.5 – 69 mm</td>
<td>5/16&quot; – 2 3/4&quot;</td>
<td>450 kg</td>
</tr>
<tr>
<td>Silverin 500</td>
<td>70 – 120 mm</td>
<td>2 3/4&quot; – 4 3/4&quot;</td>
<td>900 kg</td>
</tr>
<tr>
<td>CuNi10Fe1Mn</td>
<td>121 – 149 mm</td>
<td>4 3/4&quot; – 5 7/8&quot;</td>
<td>750 kg</td>
</tr>
<tr>
<td>CuNi30Mn1Fe</td>
<td>150 – 210 mm</td>
<td>5 7/8&quot; – 8 1/4&quot;</td>
<td>1500 kg</td>
</tr>
<tr>
<td></td>
<td>211 – 450 mm (max.)</td>
<td>8 5/16&quot; – 17 3/4&quot; (max.)</td>
<td>3000 kg</td>
</tr>
<tr>
<td>Chronin C 276</td>
<td>7.5 – 69 mm</td>
<td>5/16&quot; – 2 3/4&quot;</td>
<td>300 kg</td>
</tr>
<tr>
<td>Chronin C 22</td>
<td>70 – 130 mm</td>
<td>2 3/4&quot; – 5 1/8&quot;</td>
<td>900 kg</td>
</tr>
<tr>
<td>Chronin C 4</td>
<td>131 – 250 mm</td>
<td>5 1/8&quot; – 9 7/8&quot;</td>
<td>1500 kg</td>
</tr>
<tr>
<td>Chronin 718</td>
<td>251 – 450 mm (max.)</td>
<td>9 7/8&quot; – 17 3/4&quot; (max.)</td>
<td>3000 kg</td>
</tr>
<tr>
<td>R-Ni 99.2 (200)</td>
<td>7.5 – 69 mm</td>
<td>5/16&quot; – 2 3/4&quot;</td>
<td>300 kg</td>
</tr>
<tr>
<td>NR-Ni 99 (201)</td>
<td>70 – 120 mm</td>
<td>2 3/4&quot; – 4 3/4&quot;</td>
<td>900 kg</td>
</tr>
<tr>
<td></td>
<td>121 – 149 mm</td>
<td>4 3/4&quot; – 5 7/8&quot;</td>
<td>750 kg</td>
</tr>
<tr>
<td></td>
<td>150 – 210 mm</td>
<td>5 7/8&quot; – 8 1/4&quot;</td>
<td>1500 kg</td>
</tr>
<tr>
<td></td>
<td>211 – 450 mm (max.)</td>
<td>8 5/16&quot; – 17 3/4&quot; (max.)</td>
<td>3000 kg</td>
</tr>
<tr>
<td>Dilaton 29/18</td>
<td>7.5 – 69 mm</td>
<td>5/16&quot; – 2 3/4&quot;</td>
<td>400 kg</td>
</tr>
<tr>
<td>Dilaton 36</td>
<td>70 – 120 mm</td>
<td>2 3/4&quot; – 4 3/4&quot;</td>
<td>900 kg</td>
</tr>
<tr>
<td>Dilaton 41 / 42</td>
<td>121 – 149 mm</td>
<td>4 3/4&quot; – 5 7/8&quot;</td>
<td>750 kg</td>
</tr>
<tr>
<td>Ni-48/W48</td>
<td>150 – 210 mm</td>
<td>5 7/8&quot; – 8 1/4&quot;</td>
<td>1500 kg</td>
</tr>
<tr>
<td></td>
<td>211 – 450 mm (max.)</td>
<td>8 5/16&quot; – 17 3/4&quot; (max.)</td>
<td>3000 kg</td>
</tr>
<tr>
<td>Ferrochronin 600</td>
<td>7.5 – 69 mm</td>
<td>5/16&quot; – 2 3/4&quot;</td>
<td>300 kg</td>
</tr>
<tr>
<td>Ferrochronin 601</td>
<td>70 – 120 mm</td>
<td>2 3/4&quot; – 4 3/4&quot;</td>
<td>900 kg</td>
</tr>
<tr>
<td>Chronin 625</td>
<td>121 – 250 mm</td>
<td>4 3/4&quot; – 5 7/8&quot;</td>
<td>1500 kg</td>
</tr>
<tr>
<td></td>
<td>251 – 450 mm (max.)</td>
<td>9 7/8&quot; – 17 3/4&quot; (max.)</td>
<td>3000 kg</td>
</tr>
</tbody>
</table>

### Hire-work / Toll-work

- Cutting
- Drawing
- Heat treatment
- Mechanical / Metallurgical testing
- Melting
- Peeling
- Polishing
- Sawing
- Turning
- Shot-blasting

### Tolerances

- Iso 286 h9
- Iso 286 h11 or h12
- Annealed
- Solution annealed
- Age hardened
- Stress relieved

### Heat treatment

- Cold drawn
- Hot worked
- Annealed
- Solution annealed
- Age hardened
- Stress relieved

### Induction Furnace

- Melting & pouring in atmosphere
- Solution annealed
- Age hardened
- Stress relieved

### Vacuum Furnace (VAC)

- Melting in vacuum
- Pouring in atmosphere

### VIDP Furnace

- Melting & pouring under vacuum

### ESR

- Re-melting of a consumable electrode through a slag pool or under vacuum

### Supply Forms

<table>
<thead>
<tr>
<th>Condition</th>
<th>Dimensions*</th>
</tr>
</thead>
<tbody>
<tr>
<td>cold drawn</td>
<td>round bars max. 88.9 mm / 3 1/2&quot;</td>
</tr>
<tr>
<td></td>
<td>hexagonal bars max. 69.85 mm A/F / 2 3/4&quot;</td>
</tr>
<tr>
<td></td>
<td>square bars max. 35 mm / 1 3/8&quot;</td>
</tr>
<tr>
<td>hot worked</td>
<td>20 - 450 mm / 3/4&quot; - 17 3/4&quot;</td>
</tr>
<tr>
<td></td>
<td>turned / peeled +0.78 / -0.0 mm</td>
</tr>
<tr>
<td></td>
<td>+0.031&quot; / -0.0&quot; (ground)</td>
</tr>
</tbody>
</table>

* depending on Alloy
Best of metal.

The metal specialists of the Wickeder Group have combined their strengths to offer you the best of metal. On three continents, Europe, America and Asia, there is a wide range of standard and customised solutions available. Through our product and service-oriented business model, it is possible to provide the highest quality standards, flexibility and fast reaction times. Ultra-modern production lines, professional knowledge and innovative solutions have all helped to ensure the success of the Wickeder Group.

Working together - to maintain your competitive edge

We are determined to help you find ways to meet the technical demands of your marketplace.

These solutions could include our alloys, reliable logistics programs or special testing measures. Our procedures are naturally fully accredited in accordance with ISO 9001, ISO TS 16949, ISO 14001 and ISO 50001 amongst others.

In order to ensure consistently high levels of material and processing properties, we have our own fully equipped laboratory. We closely monitor your order throughout the production process right from the raw material, via the interim stages to the finished product.

We employ the very latest technology for chemical analysis, metallography and mechanical testing.

With the help of our expert partners, we can also offer non-standard testing methods.

Chemical testing equipment

› Inductively coupled plasma mass spectrometer
› X-Ray fluorescence spectrometer
› Optical emission spectrometer
› Carbon / Sulphur analyser
› Oxygen / Nitrogen / Hydrogen analyser
› Photometer
› Graphite furnace atom absorption spectrometer
› Wet chemical testing

Metallography testing equipment

› Sawing, grinding, polishing machine for test pieces
› Etching room
› Miscellaneous stereo microscopes with camera and photo storage function (for checking grain structure, grain size and defects)

Mechanical testing apparatus

› Test piece preparation
› Room temperature universal testing machine for bar diameters
› Room temperature universal testing machine for wire diameters
› Impact testing equipment
› Various hardness testers

www.wickeder-group.com