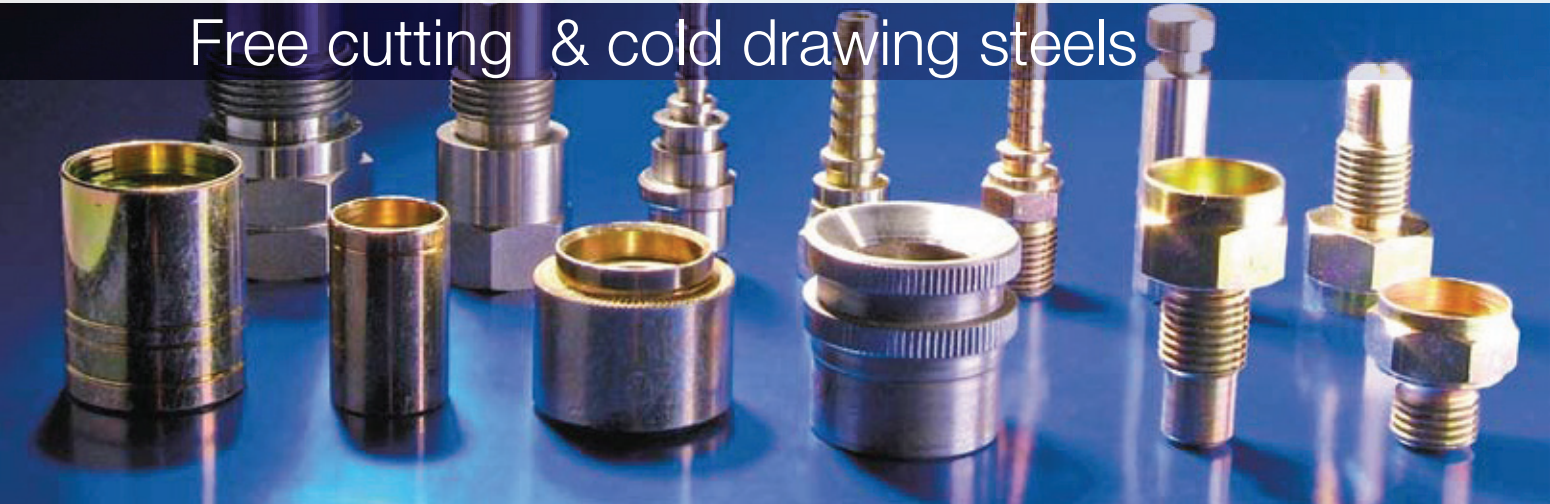


Free cutting & cold drawing steels



FREE CUTTING GRADES

These steels provide better machinability, allowing shorter machining times. From resulfurized to leaded with the addition of selenium, the performance suits the customer's application and needs. Their mechanical properties also adapt to the chemical composition and certain restrictions may apply.

Our range of free-cutting grades is the perfect result of our long experience in steelmaking and the application of the most modern design and production techniques for high quality products.

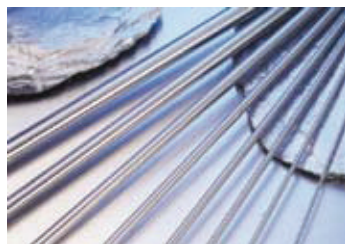
The results of independent laboratories such as CT-DEC (France) guarantee the performance of our different grades.

Our leaded steels comply with the RoHS European Directive 2002/95/EC with a maximum lead content of 0.35%.

CARBON GRADES

Our Carbon steels are used in the car industry as well as in many different applications such as machinery. With our free-cutting grades, we try to keep to the market and offer a wide range of carbon content.

The tables below show the typical analysis of the most common grades. However, we are committed to following the evolution of our customers' needs and will study all enquiries for any grade you may need.



Free cutting & cold drawing steels

Free cutting grades

| CHEMICAL SPECIFICATIONS | | | | | | | | | |
|-------------------------|----------------------|----------------|-----------|-----------|--------|-------------|-------------|-----------|-------------|
| W.Nr | Standard Designation | | %C | %Mn | %Si | %P | %S | %Pb | %Se |
| 1.1140 | EN 10084 | C15R + Pb | 0,12-0,18 | 0,30-0,60 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 | 0,20-0,35 | - |
| 1.1180 | EN 10083 | C35R + Pb | 0,32-0,39 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 | 0,20-0,35 | - |
| 1.1189 | EN 10083 | C40R + Pb | 0,37-0,44 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 | 0,20-0,35 | - |
| 1.1201 | EN 10083 | C45R + Pb | 0,42-0,50 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 | 0,20-0,35 | - |
| 1.0765 | EN 10087 | 36SMnPb14 | 0,32-0,39 | 1,30-1,70 | ≤ 0,40 | ≤ 0,035 | 0,10-0,18 | 0,15-0,35 | - |
| 1.0762 | EN 10087 | 44SMN28 | 0,40-0,48 | 1,30-1,70 | ≤ 0,40 | ≤ 0,06 | 0,24-0,33 | - | - |
| | ASTM | 1144 | 0,40-0,48 | 1,35-1,65 | ≤ 0,40 | ≤ 0,04 | 0,24-0,33 | - | - |
| 1.0727 | EN 10087 | 46S20 | 0,42-0,50 | 0,70-1,10 | ≤ 0,40 | ≤ 0,06 | 0,15-0,25 | - | - |
| 1.0757 | EN 10087 | 46S20Pb | 0,42-0,45 | 0,70-1,10 | ≤ 0,40 | ≤ 0,06 | 0,15-0,25 | 0,15-0,35 | - |
| 1.0715 | EN 10087 | 11SMN30 | ≤ 0,14 | 0,90-1,30 | ≤ 0,05 | ≤ 0,110 | 0,27-0,33 | - | - |
| 1.0736 | EN 10087 | 11SMN37 | ≤ 0,14 | 1,00-1,50 | ≤ 0,05 | ≤ 0,110 | 0,34-0,40 | - | - |
| | ASTM | 1215 | ≤ 0,09 | 0,75-1,05 | ≤ 0,05 | 0,040-0,090 | 0,26-0,35 | - | - |
| 1.0718 | EN 10087 | 11SMNPB30 | ≤ 0,14 | 0,90-1,30 | ≤ 0,05 | ≤ 0,110 | 0,27-0,33 | 0,20-0,35 | - |
| 1.0737 | EN 10087 | 11SMNPB37 | ≤ 0,14 | 1,00-1,50 | ≤ 0,05 | ≤ 0,110 | 0,34-0,40 | 0,20-0,35 | - |
| | EN 10087 | 11SMNPB30 + Se | ≤ 0,14 | 0,90-1,30 | ≤ 0,05 | ≤ 0,110 | 0,27-0,33 | 0,20-0,35 | 0,020-0,040 |
| | EN 10087 | 11SMNPB37 + Se | ≤ 0,14 | 1,00-1,50 | ≤ 0,05 | ≤ 0,110 | 0,34-0,40 | 0,20-0,35 | 0,020-0,040 |
| | ASTM | 12L14 | ≤ 0,15 | 0,85-1,15 | ≤ 0,05 | 0,040-0,090 | 0,26-0,35 | 0,15-0,35 | - |
| | ASTM | 12L14+Se | ≤ 0,15 | 0,85-1,15 | ≤ 0,05 | 0,040-0,090 | 0,26-0,35 | 0,15-0,35 | 0,020-0,040 |

Carbon grades

| CHEMICAL SPECIFICATIONS | | | | | | | | |
|-------------------------|----------------------|------------|-----------------|-----------|-----------|--------|---------|-------------|
| W.Nr | Standard Designation | | GSW Designation | %C | %Mn | %Si | %P | %S |
| | | C08E | K08C | 0,05-0,08 | 0,30-0,60 | ≤ 0,40 | ≤ 0,035 | ≤ 0,035 |
| 1.1141 | EN 10084 | C15E | K15C | 0,12-0,18 | 0,30-0,60 | ≤ 0,40 | ≤ 0,035 | ≤ 0,035 |
| 1.1141 | EN 10084 | C15R | K18C | 0,12-0,18 | 0,30-0,60 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 |
| 1.1151 | EN 10083 | C22E | K20C | 0,17-0,24 | 0,40-0,70 | ≤ 0,40 | ≤ 0,035 | ≤ 0,035 |
| 1.1208 | EN 10083 | C16R | K15SC | 0,12-0,18 | 0,60-0,90 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 |
| 1.1179 | EN 10083 | C30R | K35C | 0,27-0,35 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 |
| 1.1180 | EN 10083 | C35R | K39C | 0,32-0,39 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 |
| 1.1189 | EN 10083 | C40R | K40C | 0,35-0,43 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 |
| 1.1201 | EN 10083 | C45R | K45C | 0,42-0,48 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 |
| 1.1201 | EN 10083 | C45R | K48C | 0,43-0,50 | 0,50-0,80 | ≤ 0,40 | ≤ 0,035 | 0,020-0,040 |
| | EN 10083 | C35R +Mn+S | K40SC | 0,35-0,40 | 0,80-1,00 | ≤ 0,40 | ≤ 0,035 | 0,030-0,055 |