WIRE ROD FOR COLD HEADING

Thanks to a company history starting already 1873, Fagersta Stainless belongs to one of the world leading producers of stainless wire rod and wire. With customized chemistries the products fulfill everything from simple to high demanding applications.

STANDARD STEEL GRADES FOR COLD HEADING

Our grades have tight chemistries and therefore equal properties from delivery to delivery.

MARCEGAGLIA FAGERSTA STAINLESS

We recommend following of our standard grades:

OPTIMUM

To get best possible properties for cold heading wire rod, these parameters are important: • Tight chemistry for identical properties

- Mechanical properties and deformation hardening
- Corrosion properties
- Surfaces
- Dimension tolerances

| Grade | Marcegaglia | arcegaglia Fagersta | EN | ASTM | | DDE | сwн | Typical chemical composition, % by mass | | | | | |
|--------|----------------|---------------------|--------|-------|--------|-----|-----|---|------|------|-----|---|--------|
| family | name | | EIN | TYPE | UNS | PRE | CWH | С | Cr | Ni | Мо | N | Others |
| F | 409/4512 | R108.10 | - | 409CB | - | 11 | - | 0.03 | 11.3 | - | - | - | Nb |
| F | 409Ti/4512 | R109.11 | 1.4512 | 409TI | - | 11 | - | 0.015 | 11.3 | - | - | - | - |
| F | 430/4016 | R250.11 | 1.4016 | 430 | S43000 | 16 | - | 0.015 | 16.4 | - | - | - | - |
| F | 430L/4016 | R258.10 | 18 LNB | - | - | 18 | - | 0.01 | 18.2 | - | - | - | Cu |
| Α | 304L/4306 | R350.11 | 1.4306 | 304L | S30403 | 18 | - | 0.02 | 18.3 | 10.3 | - | - | - |
| Α | 304/4301 | R350.19 | 1.4301 | 304 | S30400 | 18 | - | 0.03 | 18.2 | 8.2 | - | - | - |
| А | 304L/4307 | R350.43 | 1.4307 | 304L | S30403 | 20 | - | 0.015 | 18.3 | 8.6 | - | - | - |
| Α | 305/4303 | R390.21 | 1.4303 | 305 | S30500 | 20 | - | 0.01 | 17.7 | 11.2 | - | - | - |
| Α | 316L/4404 | R425.10 | 1.4404 | 316L | S31603 | 24 | - | 0.015 | 16.8 | 11.2 | 2.1 | - | - |
| Α | 316L/4436 | R440.10 | 1.4436 | 316 | S31600 | 25 | - | 0.02 | 16.8 | 11.6 | 2.6 | - | - |
| А | 316Cu/4578 | R545.11 | 1.4578 | 316Cu | - | 24 | - | 0.02 | 17 | 10.8 | 2.2 | - | Cu |
| PH | Alloy 286/4980 | R569.10 | 1.4980 | A–286 | S66286 | 18 | - | 0.05 | 14.6 | 24.7 | 1.2 | - | Al, Ti |
| PH | Alloy 286/4980 | R569.60 | 1.4980 | A–286 | S66286 | 18 | - | 0.05 | 14.6 | 24.7 | 1.2 | - | Al, Ti |
| А | 304Cu/4567 | R575.21 | 1.4567 | 304Cu | S30430 | 19 | - | 0.01 | 17.9 | 9.7 | - | - | Cu |

Grade families: F = ferritic, A = austenitic, PH = precipitation hardening



MARCEGAGLIA SPECIALTIES • FAGERSTA STAINLESS AB

MECHANICAL PROPERTIES AND DEFORMATION HARDENING

Depending on end-product's shape and required tensile strength, the wire rod should have specific ductility (formability) for the cold heading process and specific level of deformation hardening. Following methods of measurement are used regarding deformation hardening: • **CWH-Factor** "Cold Work Hardening Factor", a matrix consisting of C, Cr and Ni contents. The factor varies between 80 – 150 and increases with increasing deformation hardening in the steel. • **Md30**: the temperature (°C) at which 30% true elongation (about 25% area reduction) makes 50% of the austenitic phase transform to deformation martensite. A higher temperature means higher deformation hardening in the steel.

CORROSION

PRE (Pitting Resistance Equivalent = $Cr + 3.1 \times Mo + 25 \times N$) is a factor comparing properties of different chemistries with regards to pitting and crevice corrosion in corrosive environments. A higher value means better resistance. In the table above, PRE is shown for the grades we recommend for cold heading.

SURFACES

| Direct cooling (DK) | ASTM 10-13 |
|---|------------|
| "In line"-annealing (DST) | ASTM 5-8 |

- Pit furnace (SG)
 ASTM 3-6
- Our standard procedure is to supply the wire rod in pickled condition.

DIMENSIONS

 Standard:
 5 - 18 mm (.197" - .709") in increments of 0.5 mm (.020") (MOQ:s for some dimensions)

 Tolerance:
 5.0 - 10.0
 +/-0.15

| >10.0 | – 18.0 | +/-0.2 | 2 |
|------------------|----------------|---------------|---|
| Nuliture may 60% | of the total t | alaranga gnan | |

Ovality: max 60% of the total tolerance span

Surface classes: Class 3 is the standard class which has a max defect depth of 0.10 mm for dimensions \leq 10 mm and 1% of the diameter for dimensions > 10 mm. Welding rod has class 2 (max 0.20).

PACKAGING METHODS

Coil weight: appr. 1000 kg - Outer diameter: max 1250 mm - Inner diameter: max 950 mm