



# R656.70

EN: 29 9  
AWS 312

R656.70 (29-9) is a duplex steel intended for high welding demand. The ferrite content steel is approx. 35% calc. by Schaeffler. The high chromium content (30%) gives this grade high oxidation resistance up to 1150°C (2100°F). R656.70 is only delivered in D-cooled condition, giving it slightly higher mechanical properties, with a fine uniform grain size (10-13 ASTM) and minimized precipitation of carbides and sigma phase. This type of alloy is somewhat susceptible to sigma phase formation in temp. range 550-950°C (1020-1740°F). Typical applications are welding wire for wear and heat resistant surfacing or welding dissimilar metals together, particularly if one has nickel content. It is also usable for welding stainless steel to carbon steel.

## CHEMICAL COMPOSITION (Nominal) %

| C     | Si   | Mn   | Cr   | Ni  | Mo    | N     |  |  |
|-------|------|------|------|-----|-------|-------|--|--|
| 0.010 | 0.40 | 1.85 | 30.3 | 9.2 | <0.30 | 0.055 |  |  |

PRE: 32 (PRE = Cr + 3.3 x Mo + 16 x N)

Comments: Ferrite content by Schaeffler: 35%

## PHYSICAL PROPERTIES

Condition: Annealed

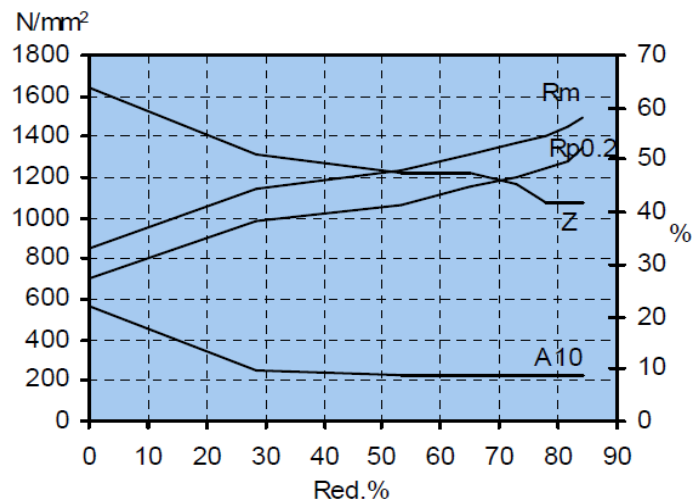
|                       |                         |
|-----------------------|-------------------------|
| Density               | 7.8 g / cm <sup>3</sup> |
| Specific heat 0-100°C | 500 J / kg°C            |
|                       |                         |

## TYPICAL MECHANICAL PROPERTIES

Condition: D-cooled

|                  |       |                              |
|------------------|-------|------------------------------|
| Proof strength   | Rp0.2 | min. 600 N / mm <sup>2</sup> |
| Tensile strength | Rm    | 750-850 N / mm <sup>2</sup>  |
| Elongation       | A10   | min. 20 %                    |

## DEFORMATION GRAPH



## THERMAL TREATMENT

|                       |         |
|-----------------------|---------|
| Annealing temperature | 1050 °C |
|                       | 1920 °F |
|                       |         |

## MAX. OPERATING TEMPERATURE

|                        |         |
|------------------------|---------|
| Operating temp. in air | °C      |
|                        | °F      |
| Scaling temp. in air   | 1150 °C |
|                        | 2100 °F |

## THERMAL CONDUCTIVITY

|       |             |
|-------|-------------|
| 20 °C | 16.0 W / mK |
|       |             |
|       |             |
|       |             |
|       |             |

## THERMAL EXPANSION

Thermal expansion per °C x 10<sup>-6</sup> from 20°C to:

|        |      |
|--------|------|
| 100 °C | 10.0 |
| 500 °C | 15.0 |
| 800 °C | 16.2 |
|        |      |
|        |      |

## RESISTIVITY

|       |          |
|-------|----------|
| 20 °C | 800 μΩmm |
|       |          |
|       |          |
|       |          |