

# Alleima® 3R65

## Billets

## Datasheet

Alleima® 3R65 is a molybdenum-alloyed austenitic chromium-nickel steel with a low carbon content.

### Standards

- ASTM: 316L, 316
- UNS: S31603, S31600
- W.Nr.: 1.4404, 1.4401
- SS: 2348
- BS: 316S11

### Product standards

- EN 10088-3
- ASTM A-314

Suitable for production of flanges etc. according to ASTM A-182

### Certificates

Status according to EN 10 204 3.1

### Chemical composition (nominal) %

| C      | Si  | Mn  | P      | S      | Cr | Ni   | Mo  | Others |
|--------|-----|-----|--------|--------|----|------|-----|--------|
| ≤0.030 | 0.4 | 1.7 | ≤0.040 | ≤0.015 | 17 | 11,5 | 2.1 | -      |

### Forms of supply

#### Sizes and tolerances

Round-cornered square, as well as round billets, are produced in a wide range of sizes according to the following tables. Larger sizes offered on request.

Surface conditions

Square billets

Unground, spot ground or fully ground condition.

Round billets

Peel turned or black condition.

Square billets

| Size                    | Tolerance | Length  |
|-------------------------|-----------|---------|
| mm                      | mm        | m       |
| 80                      | +/-2      | 4 - 6.3 |
| 100, 114, 126, 140, 150 | +/-3      | 4 - 6.3 |
| 160, 180, 195, 200      | +/-4      | 4 - 6.3 |
| >200 - 350              | +/-5      | 3 - 5.3 |

Sizes and tolerances apply to the rolled/forged condition.

Peel turned round billets

| Size                     | Tolerance | Length |
|--------------------------|-----------|--------|
| mm                       | mm        | m      |
| 75 - 200 (5 mm interval) | +/-1      | max 10 |
| >200 - 450               | +/-3      | 3 - 8  |

Unground round billets

| Size                     | Tolerance | Length |
|--------------------------|-----------|--------|
| mm                       | mm        | m      |
| 77 - 112 (5 mm interval) | +/-2      | max 10 |
| 124, 134                 | +/-2      | max 10 |
| 127, 147, 157            | +/-2      | max 10 |
| 142, 152, 163            | +/-2      | max 10 |
| 168, 178, 188            | +/-2      | max 10 |
| 183, 193                 | +/-2      | max 10 |

Other products

- Hollow bar

Mechanical properties

Testing is performed on separately solution annealed and quenched test piece.

The following figures apply on material in the solution annealed and quenched condition.

**At 20°C (68°F)**

**Metric units**

| Proof strength  |                 | Tensile strength | Elong.   | Contr. | HB      |
|-----------------|-----------------|------------------|----------|--------|---------|
| $R_{p0.2}^{a)}$ | $R_{p1.0}^{a)}$ | $R_m$            | $A^{b)}$ | Z      |         |
| MPa             | MPa             | MPa              | %        | %      |         |
|                 |                 |                  |          |        | approx. |
| ≥205            | ≥240            | 515-690          | ≥40      | ≥50    | 170     |

**Imperial units**

| Proof strength  |                 | Tensile strength | Elong.   | Contr. | HB      |
|-----------------|-----------------|------------------|----------|--------|---------|
| $R_{p0.2}^{a)}$ | $R_{p1.0}^{a)}$ | $R_m$            | $A^{b)}$ | Z      |         |
| ksi             | ksi             | ksi              | %        | %      |         |
|                 |                 |                  |          |        | approx. |
| ≥29.5           | ≥35             | 74.5-100         | ≥40      | ≥50    | 170     |

1 MPa = 1 N/mm<sup>2</sup>

a)  $R_{p0.2}$  and  $R_{p1.0}$  corresponds to 0.2% offset and 1.0% offset yield strength, respectively.

b) Based on  $L_0 = 5.65\sqrt{S_0}$ , where  $L_0$  is the original gauge length and  $S_0$  the original cross-section area.

The **impact energy** (Charpy V) at 20°C (68°F) is min 100 J (74 ft-lb).

**At high temperatures**

**Metric units**

| Temperature | Proof strength |            | Tensile strength |
|-------------|----------------|------------|------------------|
|             | $R_{p.02}$     | $R_{p1.0}$ | $R_m$            |
| °C          | MPa            | MPa        | MPa              |
|             | min.           | min.       | min.             |
| 100         | 155            | 190        | 450              |
| 200         | 127            | 155        | 400              |
| 300         | 110            | 135        | 380              |
| 400         | 98             | 125        | 380              |
| 500         | 92             | 120        | 360              |

**Imperial units**

| Temperature | Proof strength |            | Tensile strength |
|-------------|----------------|------------|------------------|
|             | $R_{p.02}$     | $R_{p1.0}$ | $R_m$            |

| °F   | ksi  | ksi  | ksi  |
|------|------|------|------|
|      | min. | min. | min. |
| 200  | 23.1 | 28.1 | 66.1 |
| 400  | 18.3 | 22.4 | 57.9 |
| 600  | 15.7 | 19.3 | 55.1 |
| 800  | 14.0 | 17.9 | 54.3 |
| 1000 | 13.1 | 17.4 | 48.9 |

**Disclaimer:** Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Alleima materials.