

This page is mainly introduced the 316S33 chemical information, mechanical properties, physical properties, mechanical properties, heat treatment, and Micro structure, etc. It also contains the use of 316S33, such as it is commonly used in bars, sheet, plates, steel coils, steel pipes, forged and other materials application.

## Data Table for Grades Stainless Steels 316S33

| 316S33 Standard Number: |                 |                                                                                                                                                                                                               |
|-------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ITEM                    | Standard Number | Descriptions                                                                                                                                                                                                  |
| 1                       | BS 1449-2       | Steel plate, sheet and strip. Specification for stainless and heat-resisting steel plate, sheet and strip                                                                                                     |
| 2                       | BS 1501-3       | Steels for pressure purposes. Specification for corrosion- and heat-resisting steels: plates, sheet and strip                                                                                                 |
| 3                       | BS 1502         | Specification for steels for fired and unfired pressure vessels: sections and bars                                                                                                                            |
| 4                       | BS 1503         | Specification for steel forgings for pressure purposes                                                                                                                                                        |
| 5                       | BS 1506         | Specification for carbon, low alloy and stainless steel bars and billets for bolting material to be used in pressure retaining applications                                                                   |
| 6                       | BS 1554         | Specification for stainless and heat-resisting steel round wire                                                                                                                                               |
| 7                       | BS 2056         | Specification for stainless steel wire for mechanical springs                                                                                                                                                 |
| 8                       | BS 3605-1       | Austenitic stainless steel pipes and tubes for pressure purposes. Specification for seamless tubes                                                                                                            |
| 9                       | BS 3605-2       | Austenitic stainless steel pipes and tubes for pressure purposes. Specification for longitudinally welded tubes                                                                                               |
| 10                      | BS 3606         | Specification for steel tubes for heat exchangers                                                                                                                                                             |
| 11                      | BS 6258         | Specification for hollow steel bars for machining                                                                                                                                                             |
| 12                      | BS 970-1        | Specification for wrought steels for mechanical and allied engineering purposes. General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steels |
| 13                      | BS 970-3        | Specification for wrought steels for mechanical and allied engineering purposes. Bright bars for general engineering purposes                                                                                 |

| 316S33 Chemical composition(mass fraction)(wt.%) |         |         |
|--------------------------------------------------|---------|---------|
| Chemical                                         | Min.(%) | Max.(%) |
| C                                                |         | 0.07    |
| Si                                               |         | 1.00    |
| Mn                                               |         | 2.00    |
| P                                                |         | 0.045   |
| S                                                |         | 0.03    |
| Cr                                               | 16.50   | 18.50   |
| Mo                                               | 2.50    | 3.00    |

|    |       |       |
|----|-------|-------|
| Ni | 11.00 | 14.00 |
|----|-------|-------|

### 316S33 Physical Properties

|                  |         |                          |
|------------------|---------|--------------------------|
| Tensile strength | 115-234 | $\sigma_b$ /MPa          |
| Yield Strength   | 23      | $\sigma_{0.2} \geq$ /MPa |
| Elongation       | 65      | $\delta 5 \geq$ (%)      |
| $\psi$           | -       | $\psi \geq$ (%)          |
| Akv              | -       | $Akv \geq$ /J            |
| HBS              | 123-321 | -                        |
| HRC              | 30      | -                        |

### 316S33 Mechanical Properties

|                  |         |                          |
|------------------|---------|--------------------------|
| Tensile strength | 231-231 | $\sigma_b$ /MPa          |
| Yield Strength   | 154     | $\sigma_{0.2} \geq$ /MPa |
| Elongation       | 56      | $\delta 5 \geq$ (%)      |
| $\psi$           | -       | $\psi \geq$ (%)          |
| Akv              | -       | $Akv \geq$ /J            |
| HBS              | 235-268 | -                        |
| HRC              | 30      | -                        |

### 316S33 Heat Treatment Regime

| Annealing | Quenching | Tempering | Normalizing | Q & T |
|-----------|-----------|-----------|-------------|-------|
| √         | √         | √         | √           | √     |

### 316S33 Range of products

| Product type    | Products                                 | Dimension                  | Processes                                   | Deliver Status                                                |
|-----------------|------------------------------------------|----------------------------|---------------------------------------------|---------------------------------------------------------------|
| Plates / Sheets | Plates / Sheets                          | 0.08-200mm(T)*W*L          | Forging, hot rolling and cold rolling       | Annealed, Solution and Aging, Q+T, ACID-WASHED, Shot Blasting |
| Steel Bar       | Round Bar, Flat Bar, Square Bar          | Φ8-1200mm*L                | Forging, hot rolling and cold rolling, Cast | Black, Rough Turning, Shot Blasting,                          |
| Coil / Strip    | Steel Coil /Steel Strip                  | 0.03-16.0x1200mm           | Cold-Rolled & Hot-Rolled                    | Annealed, Solution and Aging, Q+T, ACID-WASHED, Shot Blasting |
| Pipes / Tubes   | Seamless Pipes/Tubes, Welded Pipes/Tubes | OD:6-219mm x WT:0.5-20.0mm | Hot extrusion, Cold Drawn, Welded           | Annealed, Solution and Aging, Q+T, ACID-WASHED                |

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Note:

- (1) listed in the table apex diameter (d), to steel thickness (a) multiples said.
- (2) in the ASTM A6 standard specified scope can meet any additional conditions.
- (3) from the standard for 50 mm (2 in).

Mechanical properties

Mechanische Eigenschaften

Caracteristiques mecaniques

ReH Minimum yield strength / Mindestwert der oberen Streckgrenze / Limite d'élasticité minimale

Rm Tensile strength / Zugfestigkeit / Resistance a la traction

A Minimum elongation / Mindestwert der Bruchdehnung / Allongement minimal

J Notch impact test / Kerbschlagbiegeversuch / Essai de flexion par choc

Round bar:

Diameter : 1mm-2000mm

Square bar:

Size: 50mm \* 50mm-600mm \*600mm

Plate steel/flat bar:

Size: Thickness: 0.1mm-800mm Width: 10mm to 1500mm

Tube/pipe:

Size: OD: 6-219mm WT: 1-35 mm.

Cold-rolled sheet: Thickness: 2-5mm Width:1000mm Length: 2000mm

Hot-rolled sheet: Thickness:6-80mm Width: 210-610mm

Length: We can supply any length based on the customer's requirement.

Forging/hot rolling/ extrusion of steel.

Forging: Shafts with flanks/pipes/tubes/slugs/donuts/cubes/other shapes

Finished goods condition: hot forging/hot rolling + annealing/normalizing + tempering/quenching + tempering/any conditions based on the customer's requirement

Surface conditions: scaled (hot working finish)/ground/rough machining/fine machining/based on the customer's requirement

Furnaces for metallurgical processing: electrode arc + LF/VD/VOD/ESR/Vacuum consumable electrode.

Ultrasonic inspection: 100% ultrasonic inspection for any imperfections or based on the customer's requirement.

UTS according to SEP 1921 C/c,D/d,E/e;A388 or GB/T 6402

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