

This page is mainly introduced the HR10 chemical information, mechanical properties, physical properties, mechanical properties, heat treatment, and Micro structure, etc. It also contains the use of HR10, 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 HR10

| HR10 Standard Number: |                  |                                                                                                                                                                                   |
|-----------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ITEM                  | Standard Number  | Descriptions                                                                                                                                                                      |
| 1                     | BS HR 10 (1972)  | Specification for nickel-cobalt-chromium-molybdenum-titanium-aluminium heat-resisting alloy billets, bars, forgings and parts (nickel base, Co 20, Cr 20, Mo 5.9, Ti 2.1, Al 0.5) |
| 2                     | BS 2HR 10 (2010) | Specification for nickel-cobalt-chromium-molybdenum-titanium-aluminium heat-resisting alloy billets, bars, forgings and parts (nickel base, Co 20, Cr 20, Mo 5.9, Ti 2.1, Al 0.5) |

| HR10 Chemical composition(mass fraction)(wt.%) |         |           |
|------------------------------------------------|---------|-----------|
| Chemical                                       | Min.(%) | Max.(%)   |
| C                                              | 0.04    | 0.08      |
| Si                                             | 0.40    |           |
| Mn                                             | 0.60    |           |
| P                                              |         |           |
| S                                              |         | 0.007     |
| Cr                                             | 19.00   | 21.00     |
| Ni                                             |         | remaining |
| Mo                                             | 5.60    | 6.10      |
| Co                                             | 19.00   | 21.00     |
| Ti                                             | 1.90    | 2.40      |
| Fe                                             |         | 0.70      |
| Al                                             | 0.30    | 0.60      |
| Al+Ti                                          | 2.40    | 2.80      |

| HR10 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≥/J |
| HBS | 123-321 | -      |
| HRC | 30      | -      |

### HR10 Mechanical Properties

|                  |         |             |
|------------------|---------|-------------|
| Tensile strength | 231-231 | σb/MPa      |
| Yield Strength   | 154     | σ 0.2 ≥/MPa |
| Elongation       | 56      | δ5≥(%)      |
| ψ                | -       | ψ≥(%)       |
| Akv              | -       | Akv≥/J      |
| HBS              | 235-268 | -           |
| HRC              | 30      | -           |

### HR10 Heat Treatment Regime

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

### HR10 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                |

## We can produce Stainless Steels the specifications follows:

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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