

This page is mainly introduced the X45CrSi9-3 Datasheet, including chemical information, mechanical properties, physical properties, mechanical properties, heat treatment, and Micro structure, etc. It also contains the use of X45CrSi9-3, such as it is commonly used in bars, sheet, plates, steel coils, steel pipes, forged and other materials application.

## Datasheet for Steel Grades Specialsteel X45CrSi9-3

### X45CrSi9-3 Standard Number:

| ITEM | Standard Number | Descriptions                                            |
|------|-----------------|---------------------------------------------------------|
| 1    | NF EN 10090     | Valve steels and alloys for internal combustion engines |

### X45CrSi9-3 Chemical composition (mass fraction) (wt.%)

| Chemical |    | Min.(%) |    | Max.(%) |    |    |    |    |       |
|----------|----|---------|----|---------|----|----|----|----|-------|
| C        |    | 0.40    |    | 0.50    |    |    |    |    |       |
| Si       |    | 2.70    |    | 3.30    |    |    |    |    |       |
| Mn       |    |         |    | 0.60    |    |    |    |    |       |
| P        |    |         |    | 0.040   |    |    |    |    |       |
| S        |    |         |    | 0.030   |    |    |    |    |       |
| Cr       |    | 8.00    |    | 10.00   |    |    |    |    |       |
| Ni       |    |         |    | 0.50    |    |    |    |    |       |
| Mo       |    |         |    |         |    |    |    |    |       |
| C        | Si | Mn      | P  | S       | Cr | Ni | Mo | V  | Ta    |
| W        | N  | Cu      | Co | Pb      | B  | Nb | Al | Ti | Other |
|          |    |         |    |         |    |    |    |    |       |

Valve steels and alloys for internal combustion engines

### X45CrSi9-3 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      | -                        |

### X45CrSi9-3 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      | -                        |

### X45CrSi9-3 Heat Treatment Regime

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

### X45CrSi9-3 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, | Φ8-1200mm*L       | Forging, hot rolling and              | Black, Rough Turning,                                         |

|               |                                          |                            |                                   |                                                               |
|---------------|------------------------------------------|----------------------------|-----------------------------------|---------------------------------------------------------------|
|               | Square Bar                               |                            | cold rolling, Cast                | 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 Specialsteel the specifications follows:**