En8 Is A British Standard Grade. En-8 Comes From British Standa / BS 970 Part 3. This Is A Carbon Steel. According to **Bs 970/1991 (Part 3)**, En8 / 080M40 has 5 (Five) Chemical Elements. Also there 4 (Four) Conditions For Mechanical / Physical Properties. 830 Celsius to 860 Celsius temperature need for Normalizing.

830 Celsius to 860 Celsius temperature need for Normalizing. For Materials Hardening treatment, You must need 830 Celsius to 860 Celsius temperature and for Tempering, the temperature must need 550 Celsius to 660 Celsius. Oil used as a Quench medium for this material.

## Chemical Composition For En-8 / 080M40 Carbon Steel

|  |  |
| --- | --- |
| **Chemical Elements** | **SPECIFIED VALUE FOR EN 8 / 080M40** |
| Carbon (C) | 0.36 To 0.44 % |
| Manganese (Mn) | 0.60 To 1.00 % |
| Silicon (Si) | 0.10 To 0.40 % |
| Sulphur (S) | 0.050 % (Max.) |
| Phosphorus (P) | 0.050 % (Max.) |

## Mechanical / Physical Properties For En-8 / 080M40 Carbon Steel

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Condition** | **Size**  **(Diameter Across Flats Or Thickness)** | **Tensile Strength**  **N/Mm2**  **( Min.)** | **Yield Stress**  **N/Mm2**  **( Min.)** | **Percentage Elongation, Minimum At Gauge Length 5.65 √S0** |
| 1 | Normalized + Turned Or  Ground | 6 To150 | 550 | 280 | 16 |
|  |  | > 150 To250 | 510 | 245 | 17 |
| 2 | Hot Rolled + Cold Drawn Or  Hot Rolled + Cold Drawn +  Ground | 6 To13 | 660 | 530 | 7 |
|  |  | > 13 16 | 650 | 510 | 8 |
|  |  | > 16 40 | 620 | 480 | 9 |
|  |  | > 40 63 | 600 | 465 | 10 |
|  |  | > 63 76 | 570 | 430 | 10 |
| 3 | Hardened And Tempered +  Turned Or Ground | *Q* 6 63 | 625 To 775 | 385 | 16 |
|  |  | *R* 6 19 | 700 To 850 | 465 | 16 |
| 4 | Hardened And Tempered +  Cold Drawn Or Hardened And  Tempered + Cold Drawn +  Ground | *Q* 6 63 | 625 To 775 | 435 | 12 |
|  |  | *R* 6 To19 | 700 To 850 | 490 | 12 |

## Hardness And Impact Properties For En-8 / 080M40 Carbon Steel

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Condition** | **Size**  **(Diameter Across Flats Or Thickness)** | **Hardness**  **( BHN )** | **Impact (J)**  **Izod**  **( Min.)** | **Impact (J)**  **KCV**  **( Min.)** |
| 1 | Normalized + Turned Or  Ground | 6 To150 |  | 20 | 16 |
|  |  | > 150 To250 | 146  197 | - | - |
| 2 | Hot Rolled + Cold Drawn Or  Hot Rolled + Cold Drawn +  Ground | 6 To13 |  | - | - |
|  |  | > 13 16 |  | - | - |
|  |  | > 16 40 |  | - | - |
|  |  | > 40 63 |  | - | - |
|  |  | > 63 76 |  | - | - |
| 3 | Hardened And Tempered +  Turned Or Ground | *Q* 6 63 | 179  229 | 34 | 28 |
|  |  | *R* 6 19 | 201  255 | 34 | 28 |
| 4 | Hardened And Tempered +  Cold Drawn Or Hardened And  Tempered + Cold Drawn +  Ground | *Q* 6 63 | 179  229 | 34 |  |
|  |  | *R* 6 To19 | 201  255 | 34 |  |

**Hardening, Tempering And Normalizing Parameters For Free-Cutting En 8 / 080M40 Carbon Steels**

|  |  |  |  |
| --- | --- | --- | --- |
| **Hardening Treatment**  **Temperature**  **(**Celsius) | **Hardening Treatment**  **Quench medium** | **Tempering temperature**  **(**Celsius) | **Normalizing temperature**  **(**Celsius) |
| 830 To 860 °C | Oil | 550 To 660 °C | 830 To 860 °C |