

Quality According to standards Number C45E EN 10083-2: 2006 1.1191



| Equivalent | Italy UNI | China GB | Germany DIN | UK     | USA AISI/SAE |
|------------|-----------|----------|-------------|--------|--------------|
|            | C45       | 45       | Ck45        | 080M46 | 1045         |

**Chemical composition**

| C% max    | Si%  | Mn%       | P% max | S% max | Cr% max | Ni% max | Mo% max |
|-----------|------|-----------|--------|--------|---------|---------|---------|
| 0.42-0.50 | 0.40 | 0.50-0.80 | 0.030  | 0.035  | 0.40    | 0.40    | 0.10    |

**Temperature ▲ °C**

| Hot-forming | Tempering      | Quenching                          | Stress Relieving                        | Soft Annealing                                     |
|-------------|----------------|------------------------------------|---|--|
| 1100-850    | 540-680<br>air | 840-860<br>oil or polymer or water | 50°C under the temperature of tempering | 690 cooling 10 °C/h to 600, then air<br>HB max 207 |

**Mechanical properties**

Size C45E / C45R Hot Rolled (+QT) EN 10083-2: 2006

| Size     |           | Testing at room temperature (longitudinal) |                          |        |    |    |     |
|----------|-----------|--|--------------------------|--------|----|----|-----|
| Diameter | Thickness | R (N/mm <sup>2</sup> min)                  | Rp 0.2 N/mm <sup>2</sup> | A% min | C% | Kv | HB  |
| mm       | mm        |  |                          |        |    |    |     |
| 16/8     |           | 620  | 340                      | 14     |    |    | 190 |
| 16/8     | 40/20     | 580  | 305                      | 16     |    |    | 172 |
| 40/20    | 100/60    | 560  | 275                      | 16     |    |    | 162 |

**Table of tempering values obtained at room temperature on rounds after quenching at 850°C in water**

|                          |      |      |      |      |      |     |
|--------------------------|------|------|------|------|------|-----|
| HB                       | 615  | 597  | 510  | 401  | 311  | 242 |
| HRC                      | 58   | 57   | 52   | 43   | 33   | 23  |
| R N/mm <sup>2</sup>      | 2330 | 2240 | 1880 | 1390 | 1030 | 810 |
| Rp 0.2 N/mm <sup>2</sup> |      |      |      |      |      |     |
| A%                       |      |      |      |      |      |     |
| Kv J                     |      |      |      |      |      |     |
| Tempering at °C          | 100  | 200  | 300  | 400  | 500  | 600 |