

## Material specification sheet

### Saarstahl - C50E (Ck50)

|               |                    |   |
|---------------|--------------------|---|
| Material No.: | Former brand name: | International steel grades:   |
| 1.1206        |                    | <b>BS:</b> 080M50<br><b>AFNOR:</b> 2C50, XC48H1, XC50H1<br><b>SAE:</b> 1049, 1050 |

**Material group:** Steel for quenching and tempering according to DIN EN 10083

| Chemical composition:<br>(Typical analysis in %) | C    | Si   | Mn   | S     | other |
|--|------|------|------|-------|-------|
|  | 0,50 | 0,25 | 0,75 | <0,03 | (Pb)  |

**Application:** Plain carbon steel for mechanical engineering and automotive components.

|  |                         |                        |
|--|-------------------------|------------------------|
| <b>Hot forming and heat treatment:</b> | Forging or hot rolling: | 1100 - 850°C           |
|  | Normalising:            | 830 - 870°C/air        |
|  | Soft annealing:         | 680 - 710°C/furnace    |
|  | Hardening:              | 810 - 850°C/oil, water |
|  | Tempering:              | 550 - 660°C/air        |

**Mechanical Properties:** Treated for cold shearability +S: max. 255 HB  
Soft annealed +A: max. 217 HB

Quenched and tempered, +QT:

|  | < 16      | >16 – 40  | >40 – 100 | >100 – 160 | >160 – 250 |
|--|-----------|-----------|-----------|------------|------------|
| <b>Diameter d [mm]</b>                                       | < 16      | >16 – 40  | >40 – 100 | >100 – 160 | >160 – 250 |
| <b>Thickness t [mm]</b>                                      | < 8       | 8<t<20    | 20<t<60   | 60<t<100   | 100<t<160  |
| <b>0,2% proof stress R<sub>p0,2</sub> [N/mm<sup>2</sup>]</b> | min. 520  | min. 460  | min. 400  | -          | -          |
| <b>Tensile strength R<sub>m</sub> [N/mm<sup>2</sup>]</b>     | 750 - 900 | 700 - 850 | 650 - 800 | -          | -          |
| <b>Fracture elongation A<sub>5</sub> [%]</b>                 | Min. 13   | min. 15   | min. 16   | -          | -          |
| <b>Reduction of area Z [%]</b>                               | min. 30   | min. 35   | min. 40   | -          | -          |
| <b>Notch impact energy ISO-V [J]</b>                         | -         | -         | -         | -          | -          |

Normalised, +N:

|  |          |           |            |  |  |
|--|----------|-----------|------------|--|--|
| <b>Diameter d [mm]</b>   | < 16     | >16 – 100 | >100 – 250 |  |  |
| <b>Thickness t [mm]</b>  | < 16     | 16<t<100  | 100<t<250  |  |  |
| <b>0,2% proof stress<br/>R<sub>p0,2</sub> [N/mm<sup>2</sup>]</b> | min. 355 | min. 320  | min. 290   |  |  |
| <b>Tensile strength R<sub>m</sub> [N/mm<sup>2</sup>]</b>         | min. 650 | min. 610  | min. 590   |  |  |
| <b>Fracture elongation A<sub>5</sub> [%]</b>                     | min. 12  | min. 14   | min. 14    |  |  |