



Material Grade: **AR400 / AR450 / AR500**

Material Condition(s): **Roller Quenched / Roller Quenched and tempered**

Surface Finish: **As rolled**

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Associated Standard: **BS EN 10051**

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Description:

**A high carbon quenched – quenched and tempered steel with good weldability. A key feature is the high strength and toughness with a guaranteed hardness – Brinell level. This material has good formability.**

Typical applications: **General Engineering, yellow goods, mechanical handling, structural applications.**

Typical variations: **Many brand names featuring 400 - 450 & 500 Brinell hardness**

Conditions: **no designation or +AR – as rolled  
Q – Quenched & tempered**

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## 1. STEELMAKING

| *   | <u>C</u> | <u>Si</u> | <u>Mn</u> | <u>S</u> | <u>P</u> | <u>Cr</u> | <u>CEV</u> |
|-----|----------|-----------|-----------|----------|----------|-----------|------------|
| Min |          |           |           |          |          |           |            |
| Max | 0.23     | 0.8       | 1.7       | 0.015    | 0.025    | 1.5       | 0.45       |

(\* differs with section thickness and grade variation)

## 2. TYPICAL MECHANICAL PROPERTIES

| Test type |            |      | Tensile and hardness test (at room temperature) |                   |                   |           |            | Impact test (KV) |           |       |       |
|-----------|------------|------|---|-------------------|-------------------|-----------|------------|------------------|-----------|-------|-------|
|           |            |      | Yield (Re)                                      | 0.2 % proof       | UTS (Rm)          | Elong (A) | R of A (Z) | Hardness         | Room Temp | -20°C | -40°C |
| Variation | Sample dia | Unit | N/mm <sup>2</sup>                               | N/mm <sup>2</sup> | N/mm <sup>2</sup> | %         | %          | HB               | J         | J     | J     |
| AR400     | > 6 ≤ 80mm | Min  | 1000  |                   | 1250              | 10        |            | 360              |           |       | 30    |
|           |            | Max  |   |                   |                   |           |            | 440              |           |       |       |
| AR500     | >6 ≤ 80mm  | Min  | 1250  |                   | 1600              | 8         |            | 450              |           |       | 30    |
|           |            | Max  |   |                   |                   |           |            | 540              |           |       |       |
|           |            |      |   |                   |                   |           |            |                  |           |       |       |
|           |            |      |   |                   |                   |           |            |                  |           |       |       |