## Allowing for Machining

**Allowances for Machining.** When regular quality alloy or special quality carbon hot rolled steel bars are to be machined, experience has shown that it is advisable for the purchaser to make adequate allowances for surface finishing and specify hot rolled orthermally treated sizes accordingly.

Such allowances require consideration of the manufacturing practice utilized to remove the surface metal, as well as the bar size, length, straightness, size tolerance, and out-of-round tolerance.

Bars should be straightened before machining. The following table contains recommended minimum machining allowance, per side, for steel bars.

**RECOMMENDED MINIMUM MACHINING ALLOWANCE PER SIDE,* PER CENT OF SPECIFIED SIZE**

**Regular Quality Alloy and Special Quality Carbon Steel Bars**

| | Non-Resulfurized | Resulfurized |
|---|---|---|
| Turned on Centers | 3.0% | 3.8% |
| Centerless Turned or Ground | 2.6% | 3.4% |

Note 1. Based on bars within special straightness tolerance.

Note 2. Since straightness is a function of length, additional machining allowance may be required for turning on centers.

When regular quality alloy steel and special quality carbon steel hot rolled bars, such as squares and flats, are machined by methods other than shown in the above table, the recommended minimum surface removal is 1.6 per cent of the specified dimension for nonresulfurized steel and 2.4 per cent for resulfurized steel.

For sizes under 518 in. (15.88 mm) diameter, hexagon, square or thickness,the minimum surface removal should be 0.010 in. (0.254 mm)for non-resulfurized steel and 0.015 in. (0.381 mm) for resulfurized steel.

Resulfurized grades are typified by a poorer surface and the increased surface removal shown above is recommended.

Conversely, steels made to higher qualities may permit lesser amounts of surface removal depending on size, grade and quality specified.

*For example, the minimum reduction in diameter of rounds is twice the minimum allowance from the surface.

Reference: AISI Steel Products Manual, Alloy, Carbon & HSLA Steels. March, 1986.