**IS 4398:1994**

**Carbon chromium steel for the manufacture of Balls, Rollers and Bearing Races-Specification**

**Bearings** are machine components that support the shaft that rotates inside the machinery like wheels, gears, turbines, rotors, etc. in those machines. Bearings reduce **friction** and make rotation smooth while protecting the part that supports the rotation and maintaining the correct position for the rotating shaft.

Bearing assembly are made up of 2 primary parts namely the **Races** ie the ring shaped components and the **Rolling elements** which can be either **Balls** or **Rollers**. The inner race is attached to the rotating shaft, while the outer race is fixed to the housing, allowing the balls/ rollers to roll freely in the space between them.

Low alloy martensitic chrome steel, thanks to its **high hardness**, **wear resistance**, **surface finishing** and **dimensional precision**, is widely used to manufacture bearing components. Most **roller bearings** are made from high carbon chromium steel due to low comparative cost and high durability.

**IS 4398:1994** covers requirements of **four types** of **high carbon chromium steel** in the form of billets, bars, wire rods, wire and rings for use in manufacture of ball and roller bearings for general purposes. The four grades covered in the standard are 104Cr6, 103Cr6, 103Cr4Mn4 and 98Cr6Mn4. The standard was first published in 1967 and revised in 1972 and 1994 by BIS (MTD-16).

The standard covers requirement of **chemical composition, conditions of delivery, microstructure, hardness, inclusion content, decarburization and surface defects, fracture tests, macroetch tests** and **dimensional requirements**.

Some of the key specifications are **hardness** thus ensuring fitness of end use, as well **condition of delivery** and **microstructure** such that the steel should be in fully spherodized annealed condition, so that internal stresses do not cause undue distortion after machining.

For benefit of the purchaser, an informative Annex A, giving particulars to be specified while placing order is given.