

IS 2090: 1983 High Tensile Steel Bars used in Prestressed Concrete- Specifications

High-tensile steel bars used in prestressed concrete are typically made from high-strength alloys designed to withstand significant stress. The composition of these steel bars typically includes Carbon (C) (Around 0.5-0.85%), Manganese (Mn) (Around 0.5-1.5%), Silicon (Si) (About 0.1-0.35%), Chromium (Cr) (In smaller amounts (up to 0.5%)), Nickel (Ni) (Often included in small amounts) & Molybdenum (Mo) (Sometimes added (0.1-0.3%)). These high-tensile steel bars are commonly produced through processes like quenching and tempering, which further enhance their mechanical properties, making them suitable for high-stress applications like prestressed concrete.

High-tensile steel bars play a vital role in modern construction engineering by enhancing the strength, durability, and efficiency of various demanding structures. Beyond prestressed concrete applications, these bars are crucial in bridges, high-rise buildings, tunnels, underground and industrial structures, as well as marine, offshore, and earth-retaining structures. Their high performance and resilience make them indispensable for challenging environments and structural demands.

BIS first introduced the IS 2090 standard for high-tensile steel bars in prestressed concrete structures in 1962. This standard was later updated in 1983 to refine requirements for tolerances, proof stress, relaxation testing, and Young's modulus, with SI units replacing prior measurements for improved precision. The standard was reaffirmed in 2009, underscoring its relevance and reliability.

IS 2090 outlines the composition, manufacturing methods, and essential physical properties for high-tensile steel bars, covering sizes from 10mm to 32mm. It sets specifications for dimensions, tensile strength, proof stress, elongation at rupture, and relaxation limits, ensuring these materials meet stringent quality standards for critical construction projects.