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

High-tensile steel bars, essential for prestressed concrete applications, are crafted from high-strength alloys designed to endure significant stress. Their composition includes a blend of elements that maximize strength and durability, making them ideal for demanding construction environments.

Composition of High-Tensile Steel Bars:

- **Carbon (C):** 0.5-0.85%
- **Manganese (Mn):** 0.5-1.5%
- **Silicon (Si):** 0.1-0.35%
- **Chromium (Cr):** Up to 0.5%
- **Nickel (Ni):** Typically, small amounts
- **Molybdenum (Mo):** Occasionally included in trace amounts (0.1-0.3%)

These elements, combined and then processed through quenching and tempering, enhance the steel's mechanical properties, creating bars capable of withstanding high-stress construction applications.

High-tensile steel bars play a vital role in modern construction engineering, contributing critical strength, durability, and efficiency. Beyond prestressed concrete, these bars are essential in several demanding structures, including:

- Bridges and high-rise buildings
- Tunnels and underground constructions
- Marine, offshore, and earth-retaining structures

Their robustness and resilience enable them to perform exceptionally well in challenging environments and under high structural demands.

IS 2090 Standard by BIS:

The Bureau of Indian Standards (BIS) first introduced the IS 2090 standard in 1962 for high-tensile steel bars in prestressed concrete. It was updated in 1983 to improve specifications, including tolerance levels, proof stress, relaxation testing, and Young's modulus, with SI units enhancing measurement accuracy. Reaffirmed in 2009, IS 2090 remains a reliable and relevant standard for high-tensile steel in modern construction.

Key Specifications Outlined in IS 2090:

- **Size Range:** 10mm to 32mm
- **Properties:**
  - Dimensions and tensile strength
  - Proof stress and elongation at rupture
  - Relaxation limits

By establishing precise quality and performance standards, IS 2090 ensures that high-tensile steel bars meet the rigorous requirements necessary for critical construction applications, reinforcing their importance in large-scale, complex structural projects.