

Summary of Indian Standard

IS 1678:1998 Prestressed Concrete Poles for Overhead Power, Traction and Telecommunication Lines – Specification *(second revision)*

Of all the materials used in tall **poles for overhead electric lines** and **telecom lines** such as timber, steel, composites, etc, concrete is the most sought-after one given its durability to withstand weather, high load-carrying capacity, low maintenance and importantly **insulation** properties like wood. Unlike conventional **concrete poles**, prestressed ones have slender cross-sections yet provide much higher strength and a larger lateral load-carrying capacity. The technical requirements of such **prestressed concrete poles** are thus laid down in the standard IS 1678, which was first formulated in 1960 and revised in 1978 and 1998 to cover newer types of cement, prestressing steels and measurement of the **uprightness** of these tall poles that range in length from 6 m to 17 m.

The specification standard **IS 1678** lays down the quality requirements of pole-making **materials** namely: **hydraulic cement** [ordinary Portland cement (as per IS 269) / Portland slag cement (as per IS 455) / rapid hardening Portland cement (as per IS 8041)], **fine and coarse aggregates** (as per IS 383), **prestressing steels** [plain wires (as per IS 1785), indented wires (as per IS 6003), strands (as per IS 6006 or IS 14268), high strength bars (as per IS 2090)], **reinforcing steel** (as per IS 432 or IS 1786), **admixtures** (as per IS 9103) and the **minimum grade** of concrete.

Notably, IS 1678 provides the guide for maximum wind pressure towards **design transverse load**; minimum **depth of planting** the poles in the ground to avoid uprooting and ensuring its performance; significant transverse strength of poles carrying wires and subjected to heavy wind and snow before failure; consideration towards poles with stay rods/supporting struts; and guides in the selection of method of prestressing.

Regarding the **manufacture** of poles by prestressing method, the standard guides both **pre-tensioning** and **post-tensioning techniques** w.r.t placing of steels, maintaining the cover and spacings, concreting, compaction of poured concrete and curing and importantly the **earthing** requirements. Requirements of tests for **fresh concrete test** and **transverse strength** have been specified in IS 1678.

Towards maintaining consistent quality of the prestressed concrete poles, **sampling & inspection** and **criteria for conformity** have also been detailed.
