



Indian Standard IS 9485 : 1980 - Specification for Cold-Reduced and Hot-Rolled Carbon Steel Sheet for Porcelain Enamelling

Porcelain enamel is an **inorganic coating** applied to metals or glass for **decorative and functional** purposes. It is a **silica-based glass** mass formed through high-temperature firing (450–1200°C). Unlike ceramic coatings, it has a **glass structure** and different **dilatation coefficient**, and compared to organic paints, it features an **inorganic matrix** with a strong **chemical bond** to the substrate.

Porcelain enamel is used in a variety of applications, including **household goods** like cookware, sinks, toilets, and bathtubs; **architectural panels** for weather resistance and aesthetics; **agricultural silos** to protect against corrosion and weathering; **automotive parts**; **chemical food processing equipment**; **heat exchangers**; **pipe linings**; and **electronic substrates**.

The **Indian Standard IS 9485: 1980**, developed by the **Bureau of Indian Standards (BIS)**, applies to **cold-reduced and hot-rolled carbon steel sheet** of **commercial and drawing qualities** for **porcelain enamelling**, where the **surface of the sheet** and the **chemistry of the base metal** are of prime importance.

The **base steel for porcelain enamel** is expected to maintain **stability** at the **application temperature**, staying below its **melting point**, avoiding significant **deformation** or excessive **gas generation**, and allowing moderate **oxidation** for strong **adhesion** with the **enamel**.

The standard outlines key requirements for **chemical composition**, specifying limits for elements like **carbon, manganese, sulphur, and phosphorus** (with allowances for product analysis variations). It mandates the **manufacturing process**, requiring specific methods (e.g., **open-hearth, electric, or basic oxygen**) for consistency and quality, including checks for **nitrogen content**. The **surface and finish requirements** ensure the sheets are defect-free and suitable for **porcelain enamelling**, with different finishes for cold-rolled and hot-rolled sheets. **Testing procedures** (e.g., **bend, cupping, strain-age embrittlement**) assess mechanical properties and flexibility. **Dimensional and tolerance specifications** set precise limits for thickness, width, length, and flatness. Finally, **packaging and marking** guidelines ensure secure delivery and traceability.

The **Quality Control Order** issued by the **Ministry of Steel** mandates that **Cold-Reduced and Hot-Rolled Carbon Steel Sheets for Porcelain Enamelling**, whether sold, manufactured, or imported in India, must comply with **IS 9485:1980** and bear the **BIS Standard Mark**, ensuring adherence to high-quality standards for products used in **porcelain enamelling**.

In summary, **IS 9480 : 1980** ensures that **cold-reduced and hot-rolled carbon steel sheets** for **porcelain enamelling** meet the specific **quality, chemical, and dimensional requirements** expected by consumers, contributing to the **reliability and durability** of the final **porcelain-enamelled products**.