



IS 12679: 2023, By-Product Gypsum for Construction - Specification

Gypsum is a naturally occurring mineral made of **Calcium Sulfate Dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)**, which forms when large bodies of water evaporate over time. This versatile material is useful in construction, found in products like plaster, drywall, ceiling tiles, building blocks, and **cement**.

Interestingly, gypsum can also be created as a by-product of various industrial processes, such as when sulfuric acid reacts with calcium salts. This **by-product gypsum**, also known as **chemical**, or **synthetic gypsum**, can take several forms: 'phospho-gypsum' from phosphoric acid production, 'marine gypsum' from seawater evaporation in salt extraction, and 'sulpho-gypsum' (or FGD gypsum) produced in coal power plants during flue gas desulfurization.

Not only does by-product gypsum serve as an alternative source for construction, but it also contributes to **sustainability** by reducing industrial waste. For it to be used in construction, by-product gypsum should meet the same high standards as natural gypsum, with a focus on purity, strength, and durability. It must also be free from harmful impurities like heavy metals and fluoride, ensuring long-term safety and performance.

To standardize these requirements, the **IS 12679:2023** outlines the chemical property requirements along with test method, setting maximum permissible limits for impurities like P_2O_5 , F, Na_2O , K_2O , Cl and Organic Matter. It also specifies the minimum content of $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ & pH value of gypsum and maximum content of free water, to ensure gypsum's purity and limit harmful contaminants.

The Indian Standard IS 12679:2023, originally published in 1989 and subsequently revised in 2021 and 2023, defines comprehensive specifications for By-product Gypsum utilized in construction. This includes detailed classifications of various types, such as **Phospho-gypsum**, **Fluoro-gypsum**, **Marine gypsum**, and **Sulpho-gypsum (FGD gypsum)**.