

BRICK AND TILE CLAYS

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Unlike kaolin and ball clays used in Ceramic Industry, brick and tile clays are not pure. They contain many impurities like free silica, soluble salts of alkali and alkaline earth metals, nodular lime, iron pyrites etc. Their composition varies even within the same deposit.

These clays are made up of one or more of the 3 major clay minerals namely - kaolin, illite and montmorillonite. The properties of the particular clay will depend on the predominating clay mineral. The main difference between a brick clay and a tile clay is that the former has a low plasticity and the latter a high degree of plasticity. A tile clay cannot have particles coarser than 2 mm in diameter.

Sandy clays and lean clays exhibit a low degree of plasticity and they are normally classified as brick clays. The sandy clays have a low degree of plasticity due to the presence of sand. However, in a lean clay the large particle size does not reach the colloidal dimensions (2 microns). Therefore, they do not exhibit a high degree of plasticity. Such clays are found in the superficial layers of Kochchikade and in the Kelani valley deposits.

Clays which contain a higher percentage of colloidal clay matter (40% or more) are highly plastic. Such clays are used to manufacture tiles, engineering bricks, floor tiles etc. These clays are found in irrigation tank beds of dry zone, in lower strata of clay deposits in Kochchikade, around Deduru Oya, in Bangadeniya, in Galoya etc.

The nature of the clay mineral found in a clay also influences the plasticity. The clays in the dry zone have a high percentage of montmorillonite and therefore exhibit a very high degree of plasticity. The drying shrinkage is high (12-13%). Therefore, such clays shortened by the addition of sand before moulding, so that the drying shrinkage comes down to about 8 - 10%.

The clay deposits in Mahiyangana are illitic in nature. The clays are sufficiently plastic to become mouldable, but not excessively. Such clays do not require the addition of sand.

In the brick and tile industry, the goods are fired to about 900° - 950°C and maintained at this temperature for about 8 hours. There is a partial fusion of the aluminium oxide and silica formed by the breakdown of the clay mineral with fluxes like ferric, sodium, potassium, and calcium oxide found in the clays to form a vitreous body. The degree of vitrification, depends on several factors like the type of predominant clay mineral present, the quantity of fluxes the maximum temperature and the period of soaking.