The story of Lead

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To most people, lead sheet is all the same.

Even some within the construction industry are not aware of the different types of lead sheet that are available today. This information is designed to clarify the facts for property owners and managers, architects, specifiers, merchants and contractors.

Rolled (Milled) Lead Sheet to BSEN 12588:2006

Lead sheet has been produced by rolling since the mid 1700's and by the turn of this Century, rolled (milled) lead sheet was being used in the UK as an alternative to sand cast sheet for roofing and weathering.

Rolled lead sheet is formed by passing a slab of refined lead back and forth on a rolling mill between closing rollers, computer controlled to obtain an exact predetermined thickness.

The sheet is then slit to width and cut to length for final packing and distribution.

Such is the consistency of the process that rolled sheet will not vary in thickness by more than +/- 5% at any given point.

Which is why rolled lead sheet is the only type that is manufactured to a British and European Standard. BSEN 12588:2006 specifies thickness tolerances and chemical composition in order to produce a consistent microstructure.

The minimal variance in thickness means that when lead sheet is fitted to a roof, the extent of thermal movement can be accurately predicted and the correct fixing method adopted. The technical advice and literature of the Lead Sheet Association is based solely upon the use of rolled lead sheet to BSEN 12588:2006 and the design and construction of fully supported lead sheet roof and wall coverings (BS6915:).

It cannot be assumed to apply to either the sand-cast or machine-cast lead sheet described below, as the thickness tolerances are wider and more inconsistent than British and European Standard rolled lead sheet.

This is particularly relevant when considering thermal movement and appropriate design and fixing methods.

Technical enquiries regarding sand-cast or machine-cast lead sheet should be referred to the manufacturers or suppliers of these products.

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Sand Cast Sheet

The Romans first used sand cast sheet for water ducts and storage tanks. Its use was extended by the Normans to include roofing applications. Many church and cathedral roofs originally used sand cast sheet and records show the material has an outstanding lifespan when fitted correctly.

Today, the traditional method of manufacture continues, with molten lead being poured across a prepared bed of sand and then "skimmed" to the required thickness. The material is mostly hand-produced by a small number of specialist companies, providing sand cast sheet primarily for its rough grain aesthetic appearance or where there is a requirement on an historic property to replace “as existing”.

Its past performance record is generally due to the overall thickness and weight of the sheet used, with a 12” (305mm) square traditionally weighing 6 - 8lbs (2.7 - 3.6kg).

Sand cast sheet is not produced to any fixed chemical composition, it is not made to any British and European Standard, it does not have an Agrément Certificate.

Machine Cast Sheet

Machine-cast or DM (Direct Method) lead sheet was developed as a building material in the mid 1950s in Australia and introduced into the UK in the 1980s.

It should not be confused with either rolled sheet or traditional sand-cast sheet.

It is produced by immersing a rotating water cooled metal drum into a bath of molten lead, the lead solidifies on the surface of the drum and is lifted from the molten bath and is peeled away as the drum rotates.

The thickness of the sheet produced is determined by the speed of the drum rotation, the depth of the immersion and the temperature variation between drum and bath.

Machine cast sheet differs from rolled and sand-cast sheet in both surface finish and grain structure. The surface of the finished sheet not in contact with the drum has a dimpled finish whilst the other side is comparatively smooth.

Machine cast sheet is not made to a British and European Standard and cannot be consistently produced in the UK to the thickness tolerances achieved by rolled sheet.

Individual DM manufacturers in the UK have obtained their own British Board of Agrement Certificates but these only detail the chemical, physical and technical characteristics of each manufacturer’s own product.

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