

Introduction

The metals most commonly used in cladding systems are aluminium alloy and mild steel. However, stainless steel, copper, lead and bronze can be and have been used to create a more distinctive appearance and/or to improve the durability of the facade. This Technical Note gives guidance on the properties of non-ferrous metals and their specification and use in cladding applications. Ferrous metals are described in Technical Note 22.

Table 1 compares the typical physical properties of metals suitable for cladding and an appraisal of each is given below, covering composition(s), durability, use and compatibility.

Aluminium

Properties

High purity aluminium (99 per cent and above) has excellent durability and low density, high

thermal and electrical conductivity but low strength. For more general use, alloying elements are introduced to produce metals that retain these general characteristics but with higher strength.

The excellent durability and corrosion resistance of aluminium and aluminium alloys are due to the formation of an extremely hard oxide layer on the metal surface when exposed to air. If the surface is pitted by any of the air-borne pollutants usually found in industrial or marine atmospheres, the resulting chemical reaction produces a larger volume of powdered corrosion product than the volume of the original pit, thereby sealing off the surface and inhibiting further corrosive action. In general, corrosion of aluminium only occurs to any great degree under strong acid or alkaline conditions.

Metal	Density (kg/m ³)	Thermal conductivity (W/m°C)	Coefficient of thermal expansion (×10 ⁻⁶ /°C)	Modulus of elasticity (kN/mm ²)	Tensile strength (N/mm ²)	Melting point (°C)
Aluminium	2800	200	24	70	70 to 140	680
Mild-steel	7850	55	12	207	420 to 510	1900
Stainless steel	7800	15	17	207	500	1440
Copper	8930	400	17	100 to 130	210 to 360	1083
Lead	11340	35	30	1.4	15	327
Brass (40% zinc)	8400	129	21	103	370 to 540	905
Titanium	4500	21	9	110	240	1940
Aluminium Bronze	8800	70	18	120	420 to 690	1050

Table 1 Typical values of some physical properties of metals suitable for cladding