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PROPERTIES OF VITREOUS ENAMEL STEEL

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(E&OE - Document and content subject to change without prior notice)

- **Variety of Colours and Finishes:** Vitreous enamels can be coloured in a vast range of hues and shades. In cladding applications the surface generally has a high gloss finish, however semi-gloss, silky matt or matt finishes can be produced. A large range of standard colours is complemented by the possibility of creating special colours for specific applications and the possibility also exists of permanently incorporating logos, designs, patterns and signage into the surface.
- **Colour Fastness:** Enamel colours are unique in appearance (brilliance), fade proof, resistant to light, ultra violet (UV) radiation, industrial pollutants, salt sea air and hail.
- **Resistance to corrosion:** The absence of a finite boundary layer between the vitreous enamel coating and the steel base and the fact that the steel is encapsulated in glass, ensure that the structural integrity of the steel is maintained and potential damage to the substrate is avoided. Panels cannot rust even in extreme marine conditions.
- **Hygienic:** Due to the absence of pores the smooth, hard enamel surface eliminates the absorption of dirt and grease, reduces the presence and growth of bacteria and mould, therefore creating a more hygienic and healthy environment. Independent comparative studies have shown that in this respect enamel outperforms other materials and coatings, including stainless steel. Enamel does not absorb or transmit odours or flavours.
- **Resistance to Abrasion:** The surface hardness is very similar to that of glass. On the MOH scale vitreous enamel has a rating of approximately 5 degrees (apatite) to 7 degrees (quartz). On the same scale marble has a rating of 3 and diamonds of 10. This property allows the surface to resist mechanical abrasion and prevent scratching, either accidental or intentional.



Member of the Institute
of Vitreous Enamellers (IVE)



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- **Resistance to Vandalism, Impacts and Chemicals:** The extreme hardness of the surface makes it very difficult to mark permanently with knives, keys, screwdrivers. Enamel is resistant to most alkali, all acids (at room temperature) except hydrofluoric acid, all organic solvents, normal detergents (pH > 7), all neutral saline solutions (pH = 7) and is unaffected by kerosene. Graffiti applied by means of markers and pens can be cleaned off with the use of an appropriate detergent and water. Only impacts of a certain force will chip the enamel.
- **Heat and Fire Resistance:** Resistant to heat, naked flames or fire up to 650^o C and continuous temperatures up to 400^o C, vitreous enamel does not support the spread of flames or smoke (incombustible) and does not give off any toxic gasses.
- **Resistance to Thermal Shock:** Resistant to extreme temperature differentials of between 450^o C to – 40^o C, vitreous enamel can withstand rapid cooling, when drenched with water spray, from 400^o C to room temperature over a 30 second period.
- **Vermin-proof:** The surface is impervious to attack and damage by rodents and insects.
- **Acoustic and Thermal Insulation:** Acoustic and thermal characteristics are dependant on both the type and nature of the core materials used. Specific performance requirements can be accommodated and should be addressed at design stage.
- **Dielectric Properties:** Enamel has a high degree of electrical resistance and acts as an excellent insulator, especially at room temperature. The ability to prevent or block stray currents enhances the ability of the enamel coating to protect the steel from corrosion.
- **Low Maintenance:** The surface requires very simple and periodical maintenance. Enamel is extremely easy to clean. Increases in the cost of labour make it a sound approach to make a slightly higher initial investment and then benefit from lower maintenance and refurbishment costs.
- **Green Issues and Environmental Care:** Vitreous Enamel Steel is a recyclable material. The presence of any lead or lead-compound elements is being reduced or eliminated from the formulation of enamels.
- **Sustainability Input during and after Construction Phases:** Vitreous Enamel Steel has an extremely long working life (30+ years), extending the life span of the product and of the building, reducing the need for refurbishment; Vitreous Enamel Steel requires minimum maintenance and is easily cleaned with very basic detergents without the need for strong chemicals.