
Development of low melting glasses as durable transparent enamel colors for the manufacture of decorated glass panels

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Abstract

Today glass is broadly used in modern architecture. For applications indoor it is possible to produce decor glass by using enamel colors and glass painting techniques without any problems. However, this is more limited for applications outdoor. Humidity and environmental pollution attack the surface of the coating and damage it strongly. There are only few colors on the market which are resistant towards acids and bases until now. Additionally, most of those colors are opaque. In order to extend the color palette, chemically resistant colored glasses are being developed which are transparent, relatively low melting and intensively toned even in thin coat thickness. To achieve such ambitious aim, many parameters have to match which act in complex manner. Metal oxides were used to color the glasses. A lead-free glass composition was developed to avoid an exposition of heavy metals to the environment. The glasses were characterized, in particular in terms of their thermal properties, their crystallization and corrosion behavior as well as their chemical and environmental durability. Different practical applications will be shown.

Keywords: low melting glass, glass enamel, decoration, architecture, corrosion, chemical durability, environmental stability

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