# EFFECT OF PAINT COMPOSITION ON THE PROPERTIES OF BLACK AUTOMOTIVE GLASS ENAMEL

***Selime Öztürk***

***Chemical Engineering Department, Yıldız Technical University, İstanbul, Turkey***

***0009-0005-5076-7722***

***İlknur Küçük***

***Chemical Engineering Department, Yıldız Technical University, İstanbul, Turkey***

***0000-0001-9203-0693***

***Buğra Çiçek***

***Department of Metallurgical and Materials Engineering, Yıldız Technical University, İstanbul, Turkey***

***0000-0003-2477-4169***

|  |
| --- |
| **ABSTRACT**  The main processes used in the production of automobile glasses are lamination, tempering, sag bending, and press bending. Laminated glasses can be produced by sag bending or press bending [1]. Windshield glasses produced by sag bending process should ensure low tempering temperature, high chemical and physical properties and low UV transmittence means high optical density [2]. Automotive glass enamels [3] that ensures those specifications include 3 main components; high opacity low melting bismuth base frit [4], CuCr2O4 black spinel pigment, and an organic medium [5].  The composition of the enamel as well as process factors such as frit production method, frit grinding types, frit particle size distribution, pigment particle size, media contents and final process steps also affect the final glass enamel paint properties.  Present study, the effect of the composition of glass enamel paint on physical properties such as color, gloss, optical density and chemical resistance was investigated. The structure, surface and physical properties of the automotive glass enamel applied on the substrate by silk screen printing [6] method were characterized by using various techniques such as XRF, XRD, SEM, PSD, BET, colour colorimetry  **References:**  [1] Tu,Lele.,Wang,Hui.,Liu,Xianping.,Guan,Jinliang.,Caı,Feng.,(2023).**Windshield for Vehicle and Method for Manufacturing the Same,** US20230211587A1, 1-15  [2] Sakoshe,George,E.,Maloney,John,J.,Gleason,Cody.,Sridharan,Srinivas-an.(2017).**Modified Black Spinel Pigments for Glass and Ceramic Enamel Applications**, International Application Published Under The Patent Cooperation Treaty, WO2017127788A1, 3-7.  [3] Sing,Sandeep,K.,Sakoshe,George,E.,Klimas,David,A.,(2013).**Glass Enamel for Automotive Applications**, WO2013/126369A1,1-6  [4] Prunchak,Robert.,Sgriccia,Matthew.,(2008).**Frits and Obscuration Enamels for Automotive Applications**, WO2008/130747A1,1-8  [5] Hung-Wen,Lin.,Chang-Pin,Chang.,Wen-Hwa, Hwu., Ming-Der,Ger.(2008).**The Rheological Behaviors of Screen-Printing Pastes, Journal of Materials Processing Technology 197,** 284-291  [6] Sauer, M.,Meilchen,S.,Kalleder,A.,Mennig,M.,Schmidt,H.,(2004). **Sol-gel Technologies for Glass Producers and Users, Silk Screen Printing,**117-120 |

# Keywords: Automotive, sag bending, lamination, black enamel, glass-ceramics