DEVELOPMENT OF UV-LED CURABLE BLACK INKS

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Abstract: Today, transition to a low carbon footprint economy is driving automotive industry to drastically reduce their energy consumption and VOC emissions. Particularly, painting stage is responsible for up to 90% of emissions and 60% of energy consumption of an industrial automotive plant[1,2]. In this context, UV-LED curable inks combined with printing techniques offer a promising solution[3,4,5]. However, development of new printable formulations capable of combining environmental requirements with demanding automotive coatings specifications, REACH restrictions and process requirements like finish quality and surface complexity has proven to be a major challenge. As a result, we have developed 100% solids and UVA curable black inks, with viscosity of around 7 mPa.s. These systems are cured exclusively by radical photopolymerization, without using conventional photoinitiator systems for black inks, which are composed by REACH banned molecules. In addition, according to preliminary tests, their glass transition temperatures are higher than 80°C, which suggests they are suitable for automotive coatings applications in terms of mechanical properties.

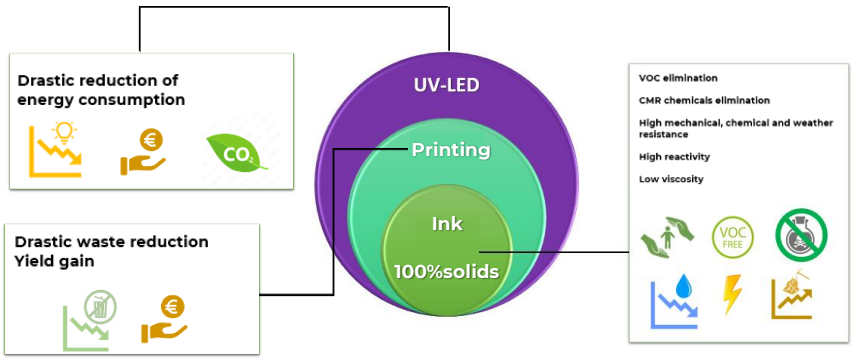

Figure 01: Curable inks advantages in the context of printing processes and UV-LED drying

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