

Ink

AU Series

Auto Glass Enamel

FIELD OF APPLICATION

Substrates

Laminated glass

Toughened glass

Field of Use

In the automotive industry two kinds of glass enamels are used, laminated and toughened.

Toughened products are used for side lights, back lights and sunroofs

Laminated products for windshields.

Side Lights

The side lights are in fact the less technical demanding with respect to the glass enamel. Semi-mat shine and printability on both the air and tin side of the glass, without any change in color are the main characteristics of this kind of glass enamel. There are heavy metal-free glass enamels in

all kind of media systems available for side light printing, but also side light designers

are more and more requiring complex bending. Again non-stick properties of the glass enamel are becoming more important. The tendency to use conductive pastes on side lights is already noticeable (burglar alarms and antennas). For the short term the enamel for side lights will need a fair amount of research and development work in order to live up to the new requirements.

Back Lights

The back light is traditionally the most complex piece of glass in the car. It can have a very complex shape and therefore the enamel must have very good non-stick properties, as the glass is bent by a press at about 700 °C. A large amount of black enamel is used for obscuring and styling aspects. The glass enamel has to be overprinted with a conductive ink for the defrosting/defogging circuit. The glass enamel has to hide the silver bus bar (when seen through the glass).

CHARACTERISTICS

Particle size of the pigment is $\geq 5\mu\text{m}$

The core range exists of 3 products, which covers a wide firing 650C - 720C and has very good anti stick properties. For special



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applications we can offer two others, which have different In general it can be said that it has a neutral black color (a-and b-value close to zero),is very opaque, has very good silver hiding under intense light and has very good non-stick properties.

The main characteristics are: Pb & Cd free, Bismuth based, Silver hiding No blue discoloration when over fired Wide working range Good acid resistance Can be used on tin & air side(sidelights)

HOW TO USE

Water wash the glass to remove impurities and air dry it thoroughly to ready the glass for printing. There are two sides one side is air side /fire side other side is tin side. Laminated front glass, rear glass and roof glass is always advisable to print on air/fire side to get good quality results. Sidelight glass can be printed on air/fire or tin sides. Mesh Recommended- 200-250 mesh. The viscosity is controlled 30-50 pa.s (Rion (VT-04)/24°C) out of factory. If paste is adhered on the screen when printed, we suggest adding a small amount of thinner into the paste to adjust the viscosity and ensure a sustained printing. The viscosity should be controlled at 8000+/-2000mpa.s (Rion (VT-04)/24°C) select the squeeze of 60-70 shore hardness. Gap between the screen and glass substrate should be between 3-6mm.Minimum squeeze pressure required to transfer the ink to the glass is recommended. Wet film

thickness is about 24-30um. After printing the glass should be passed through the oven at temperature of 150°C for 5-10 minutes to make the ink touch dry. Cool the glass and check the printing quality before it send for final firing. Fusing temperature is 650C -720C. Holding time in the furnance depends upon the thickness of the glass, about 160 seconds if glassthickness is 4mm.

Minimum wet layer/thickness required of 24µm to obtain perfect silver hiding

Drying temperature	100°C-150°C	5-10 minutes
Fusing temperature	650C-720C	about 160 (4mm thickness)

CLEANER

Use TP-65 for cleaning the screen /washing up.

RANGE OF COLORS

Basic Colors

Leaded

JL-A1-002 Black (Laminated Glass) : Finish - Glossy

JL-A1-001 Black (Side & Rear Glass) : Finish – Glossy



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JL-A1-006 Black (Side & Rear Glass) :
Finish – Matt

Lead Free

LF-A11-002 Black (Laminated Glass) : Finish
- Glossy

LF-A11-001 Black (Side & Rear Glass) :
Finish – Glossy

LF-A11-006 Black (Side & Rear Glass) :
Finish – Matt

LF-A11-003 Black (Silver hiding for Rear
Glass)

Coefficient of Thermal Expansion (CTE)

$(85\sim 95) \times 10^{-7}/K-1(50-300^{\circ}C)$

ADDITIVES

Thinner:

Before production, the viscosity of the
screen printing has to adjusted by the
addition of thinner.

Thinner, fast dry (addition 5%-10%) SD-06

Thinner, Slow (addition 5%-10%)
SD-11

SD-06 can be used along with SD-11 to
meet the printing conditions requirement.

TYPE OF PACKING

20-kg Can

SHELF LIFE

Shelf life depends on the storage
conditions(temperature and humidity).

The shelf life for an unopened ink container
if stored ink dark room at a temperature of
15°C-25°C is one year from the date of
manufacturing.

Under different conditions, particularly
higher storage temperatures, the shelf life
is reduced. In such case, the warranty given
by Spinks expires.

Storage

Enamel should be stored in its
original package preferably tightly
closed and in a clean dry place at
5~25°C.Store material away from heat
and direct sunlight .When storing
more than one batch, use first-in and
first-out system. Cold pastes should
always be shaken well prior to use.
This product should be used within 12
months of production date for
optimum results.

PRECAUTION

It is very important to keep the printing
environment clean and good environment
can bring good printing result. The room
temperature should be control at $25\pm 2^{\circ}C$,
humidity at 60%RH and make sure no dust
in printing.

Please refer MSDS before use.

Be sure to do trials before commercial run to confirm that the product fits the purpose

Additional technical information may be obtained from our Technical Department.

All characteristics described in this Technical Data Sheet refer exclusively to the standard products listed under range, provided that they are processed in accordance with the intended use and only when used with the recommended additives. The selection and testing of the ink for specific applications is exclusively your responsibility. Should, however, any liability claims arise, they shall be limited to the value of the goods delivered by us and utilized by you with respect to any and all damages not caused intentionally or by gross negligence.

Properties

Acid durability

Immerse d the fired sample partly in 0,1N H₂SO₄ at 40°C,during 24 hours. Clean afterwards with water and dry the glass.

Grade 3

Alkaline durability

Immersed the fired sample partly in 0,1N NaOH at 40°C,during 24 hours. Clean afterwards with water and dry the glass.

Grade 3

Water durability

Immersed the fired sample partly water at 50°C, during 10 days. Clean afterwards with water and dry the glass.

