

# Auxiliary agents and Additives for solvent based screen printing inks



## Technical datasheet

## Additives

### 1. INTRODUCTION:

For a wide variety of solvent-based screen printing tasks, we offer an extensive product range of screen printing inks.

In general, it must be noted that solvent-based inks are **not** ready to use.

The necessary printing viscosity requires adjustment **before** and during the printing process through the addition of additives /solvents.

Technical problems based on for example difficult substrates, unfavourable climate and printing parameters can be solved thanks to the addition of auxiliary agents or additives.

Careful usage of auxiliaries and additives can improve the ink properties.

For detailed information, please refer to the technical datasheets of the respective ink series.

All values of addition are in percentage of weight.

### 2. EXPLANATION:

#### 2.1 Adjustment of Rheological Properties:

**2.1.1 Viscosity** is the measurement of flow characteristics or the resistance of a printing ink which is being deformed by shear stress. A higher viscosity ink is equivalent to a „thicker“ ink (lower flow properties). If the viscosity is lower, then the printing ink is thinner (higher flow properties).

The necessary printing viscosity has to be adjusted **before** and during the printing process by adding

- Thinner / and or
- Retarder

The right viscosity has influence for example to the printing quality of an image, screen/ mesh opening, drying time (in dependence to the room temperature) and printing speed.

For the printing of delicate plastic materials like polystyrene , acrylic and moulded plastic parts we recommend to use **mild** thinner and retarder.

Generally, we differentiate between

- **Thinner, standard** : adjust to working viscosity with a medium drying time range.
- **Thinner, fast**: adjust to working viscosity with faster drying time. This thinner can be used also for **spraying** with help of a spray gun.
- **Thinner slow**: adjust to working viscosity with longer drying time and longer mesh opening.

Please notice that the drying time will be longer and blocking resistance will be reduced.

By adding thinner, the solvent properties of the binder and the dissolving strength change and therefore the adhesion onto the substrate will be influenced.

- **Retarder**: will reduce printing viscosity . Will be used for slower printing speed and increase the time length of mesh opening.
- **Retarder paste**: has the same function as retarder (see above). Using retarder paste the viscosity of printing ink will not changed.

**2.1.2 Thixotropy** is the property of printing inks to show a time-dependent change of viscosity under mechanical stress (such as squeegee pressure, squeegee movement, in stirring). A thixotropic ink shows a decrease over time at a constant shear rate. For example, high density white and halftone inks are developed with a higher thixotropy.

The addition of thixotropic agent will increase the thixotropy of the ink.

#### 2.2. Optimisation of Ink qualities:

##### 2.2.1 Ink flow (levelling) faults:

Levelling/ ink flow faults can be caused due to the bad wetting ability of the substrate. These faults such as pinholes or „orange skin“ effect, for example can be solved with the addition of **thinner** and levelling agent. There are levelling agents available which contain silicone. The amount of addition should not exceed 1%. Please notice that the addition of silicone can effect the over printability of the ink.

##### 2.2.2 Minimisation of electrostatic effects:

Electrostatic effects can occur when printing onto plastic materials (influence of squeegee friction, polyester screen) and under unfavourable climate conditions (low humidity).

The addition of max 5% **thinner** or antistatic agent **100VR1212** (0,5-1 %) can minimize the electrostatic effect.

##### 2.2.3 Hardener

In general, we offer ink series as a 1 component and 2 component version.

To optimize mechanical and chemical resistance, we recommend the addition of hardener.

# Auxiliary agents and Additives for solvent based screen printing inks



Please note that the final chemical and physical resistance of the ink is only achieved after 36 hours at room temperature of 20° C or 48 hours at room temperature of 20° C for our ink series 380 DD.

In general, we distinguish between

- **Hardener, standard:** 100VR1433 and 100VR1420 During processing and drying of the printed ink, the ambient temperature should not be lower than 15° C otherwise the chemical cross linking process is stopped. Also avoid high humidity for several hours after printing as the hardener is sensitive to humidity. At room temperature of 20 ° C a pot life of approximately 8 - 12 hours can be achieved.
- **Hardener, fast:** SE5214  
If a faster hardening of the ink is required, hardener SE5214 is recommended. At room
- **Hardener, for higher weather resistance :** 100VR1431  
For higher requests to outdoor usage we recommend to use this hardener. 100VR1431 is less reactive than standard hardener, therefore the drying time is extended. At room temperatures of 21 °C the pot life is approx. 16 hours.

The overprinting of inks that contain hardener must be performed within 24 hours. A completely dried ink film can not be overprinted.

## 2.2.4 Adhesion modifier

Adhesion Modifier and primer should be used in order to achieve a good adhesion onto substrates such as untreated polypropylene or glass.

The primer has low viscosity and can be applied by spraying or immersing.

Adhesion modifier for untreated PP: 100VR1260

Primer for untreated PP: 100VR1237

Adhesion modifier for glass: 100 VR 1294

## 2.2.5 Special ink effects (matt/ gloss)

Adding matt additive (powder) the gloss level can be modified from gloss to matt. The higher the percentage of matt powder, the higher the matt level.

Adding gloss varnish will increase the gloss level of the ink, but will reduce ink opacity .

## 2.2.6 Other Additives:

**Slip additive:** 100VR1374

To increase mechanical resistance, we recommend to add maximum 1 % of slip agent 100VR1374.

# Auxiliary agents and Additives for solvent based screen printing inks



## 3. OVERVIEW of auxiliaries and agents:

### Ink series 10KK:

| Article No. | Product Name                       | Function                                                                                                                        | Addition    |
|-------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------|
| VD 38571    | thinner, standard                  | To reduce viscosity                                                                                                             | (15 – 25) % |
| VS 35353    | thinner, fast                      | To reduce viscosity with faster drying time                                                                                     | (15 – 25) % |
| 100VR1390   | thinner, for glass                 | To reduce viscosity                                                                                                             | (15 – 25) % |
| VD 35696    | thinner, mild                      | To reduce viscosity (for example acrylic, moulded plastic parts from PC, polystyrene)                                           | (15 – 25) % |
| VZ 35928    | retarder, standard                 | To reduce viscosity                                                                                                             | (5 – 10) %  |
| VZ 34392    | retarder, slow                     | To reduce viscosity with longer drying time                                                                                     | max. 5 %    |
| 100VR1170   | retarder, for glass                | To reduce viscosity                                                                                                             | (10 – 20) % |
| VZ 38693    | retarder, mild                     | To reduce viscosity (for example acrylic, moulded plastic parts from PC, polystyrene)                                           | (5 – 10) %  |
| 10KK0030    | retarder paste                     | Longer drying time, but without changing viscosity                                                                              | max. 10 %   |
| 10KK0026    | varnish                            | To improve adhesion, but reduces opacity                                                                                        | max. 10 %   |
| 100VR1194   | Matting powder                     | Matting agent, reduction of gloss level, increase of viscosity                                                                  | 5 - 8 %     |
| 100VR133    | Levelling agent, contains silicone | To improve ink flow, levelling and wetting                                                                                      | 0,5 – 1 %   |
| 100VR1433   | hardener, standard                 | To improve adhesion and resistance (potlife: 8-12 H at 20°C)                                                                    | 20 %        |
| 100VR1294   | adhesion modifier, for glass       | To improve ink adhesion onto the substrate (after 24-48hours)<br>With oven drying (25 min at 180°C) .potlife is 8 hours at 20°C | 5 %         |
| 100VR1410   | adhesion modifier, for glass       | To improve ink adhesion onto the substrate (after 24-48 hours)<br>Without oven drying (potlife: 8 hours at 20°C                 | 7%          |
| 100VR1374   | slip additive                      | To increase mechanical resistance                                                                                               | max. 1%     |

### Ink series 110GE:

| Article No.  | Product Name                       | Function                                                                                                                            | Addition    |
|--------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------|
| VD 38571     | thinner, standard                  | To reduce viscosity                                                                                                                 | (15 – 25) % |
| VS 35353     | thinner, fast                      | To reduce viscosity with faster drying time                                                                                         | (15 – 25) % |
| VZ 35928     | retarder, standard                 | To reduce viscosity                                                                                                                 | (5 – 10) %  |
| VZ 34392     | retarder, slow                     | To reduce viscosity with longer drying time                                                                                         | max. 5 %    |
| VZ 100VR1393 | Retarder, very slow                | To reduce viscosity with longer drying time, longer mesh opening                                                                    | max. 5 %    |
| 110GE0070    | varnish                            | To improve adhesion, but reduce of opacity                                                                                          | max. 10 %   |
| 110GE0083    | Retarding paste                    | To increase drying without changing viscosity                                                                                       | max. 10 %   |
| 110GE0081    | Raster paste                       | To improve halftone printing, to achieve sharper dots and fine types and lines                                                      | max. 10 %   |
| 100VR1294    | adhesion modifier, for glass       | To improve ink adhesion onto the substrate (after 24-48hours)<br>With oven drying (25 min at 180°C) .The potlife is 8 hours at 20°C | max. 2 %    |
| 100VR133     | Levelling agent, contains silicone | To improve ink flow, levelling and wetting                                                                                          | 0,5 – 1 %   |
| 100VR1374    | Slip additive                      | To increase mechanical resistance                                                                                                   | Max. 1%     |

### Ink series 110ZS:

| Article No. | Product Name                       | Function                                                       | Addition    |
|-------------|------------------------------------|----------------------------------------------------------------|-------------|
| VD 35696    | thinner, mild                      | To reduce viscosity (for polystyrene)                          | (15 – 25) % |
| VZ 38693    | retarder, mild                     | To reduce viscosity (for polystyrene)                          | (5 – 10) %  |
| 110ZS0061   | varnish                            | To improve adhesion, but reduce of opacity                     | max. 10 %   |
| 110ZS0062   | Retarding paste                    | To increase drying without change of viscosity                 | max. 10 %   |
| 100VR1194   | Matting powder                     | Matting agent, reduction of gloss level, increase of viscosity | 5 - 8 %     |
| 100VR133    | Levelling agent, contains silicone | To improve ink flow, levelling and wetting                     | 0,5 – 1 %   |

# Auxiliary agents and Additives for solvent based screen printing inks



## Ink series 180PE:

| Article No. | Product Name                       | Function                                                                              | Addition    |
|-------------|------------------------------------|---------------------------------------------------------------------------------------|-------------|
| VD 38571    | thinner, standard                  | To reduce viscosity                                                                   | (15 – 25) % |
| VS 35353    | thinner, fast                      | To reduce viscosity with faster drying time                                           | (15 – 25) % |
| VD 35696    | thinner, mild                      | To reduce viscosity (for example acrylic, moulded plastic parts from PC, polystyrene) | (15 – 25) % |
| VZ 35928    | retarder, standard                 | To reduce viscosity                                                                   | (5 – 10) %  |
| VZ 34392    | retarder, slow                     | To reduce viscosity with longer drying time                                           | max. 5 %    |
| VZ 38693    | retarder, mild                     | To reduce viscosity (for example acrylic, moulded plastic parts from PC, polystyrene) | (5 – 10) %  |
| 180PE0022   | Retarding paste                    | To increase drying without change of viscosity                                        | max. 10 %   |
| 180PE0017   | varnish                            | To improve adhesion, but reduce of opacity                                            | max. 10 %   |
| 180PE0016   | Gloss varnish                      | To improve adhesion, but reduces opacity, to increase gloss level                     | max. 10 %   |
| 100VR1194   | Matting powder                     | Matting agent, reduce of gloss level, increase of viscosity                           | 5 - 8 %     |
| 100VR133    | Levelling agent, contains silicone | To improve ink flow, levelling and wetting                                            | 0,5 – 1 %   |
| 100VR1433   | hardener, standard                 | To improve adhesion and resistance (potlife: 8-12 H at 20°C)                          | 10 %        |
| SE5214      | hardener, fast                     | To improve adhesion and resistance (potlife: 6-8 H at 20°C)                           | 10 %        |
| 100VR1374   | Slip additive                      | To increase mechanical resistance                                                     | max. 1%     |

## Ink series 380DD:

| Article No. | Product Name                       | Function                                                       | Addition    |
|-------------|------------------------------------|----------------------------------------------------------------|-------------|
| VD 38571    | thinner, standard                  | To reduce viscosity                                            | (15 – 25) % |
| VS 35353    | thinner, fast                      | To reduce viscosity with faster drying time                    | (15 – 25) % |
| VZ 35928    | retarder, standard                 | To reduce viscosity                                            | (5 – 10) %  |
| VZ 34392    | retarder, slow                     | To reduce viscosity with longer drying time                    | max. 5 %    |
| 380DD0026   | Retarding paste                    | To increase drying without change of viscosity                 | max. 10 %   |
| 380DD0017   | varnish                            | To improve adhesion, but reduce of opacity                     | max. 10 %   |
| 100VR1194   | Matting powder                     | Matting agent, reduction of gloss level, increase of viscosity | 5 - 8 %     |
| 100VR133    | Levelling agent, contains silicone | To improve ink flow, levelling and wetting                     | 0,5 – 1 %   |
| 100VR1433   | hardener, standard                 | To improve adhesion and resistance (potlife: 8-12 H at 20°C)   | 50 %        |
| SE5214      | hardener, fast                     | To improve adhesion and resistance (potlife: 6-8 H at 20°C)    | 50 %        |

## Ink series 400LMG:

| Article No. | Product Name                       | Function                                                                       | Addition    |
|-------------|------------------------------------|--------------------------------------------------------------------------------|-------------|
| VD 38279    | Verdünner, Standard                | To reduce viscosity                                                            | (15 – 25) % |
| VS 37220    | Verdünner, schnell                 | To reduce viscosity with faster drying time                                    | (15 – 25) % |
| VZ 35928    | retarder, standard                 | To reduce viscosity                                                            | (5 – 10) %  |
| 400LM0007G  | Thinner , flexible                 | To reduce viscosity, to improve flexibility                                    | max. 10 %   |
| 400LM0003G  | varnish                            | To improve adhesion, but reduce of opacity                                     | max. 10 %   |
| 400LM0005G  | Thixotropie paste                  | Increases the thixotropy of the ink                                            | max. 10 %   |
| 400LM0006G  | Raster varnish                     | To improve halftone printing, to achieve sharper dots and fine types and lines | max. 10 %   |
| 100VR133    | Levelling agent, contains silicone | To improve ink flow, levelling and wetting                                     | 0,5 – 1 %   |
| 100VR1420   | hardener, standard                 | To improve adhesion and resistance (potlife: 8-12 H at 20°C)                   | 7 %         |
| 100VR1374   | Slip additive                      | To increase mechanical resistance                                              | max. 1%     |

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## Ink series 450JK:

| Article No. | Product Name                        | Function                                                                              | Addition    |
|-------------|-------------------------------------|---------------------------------------------------------------------------------------|-------------|
| VD 38571    | thinner, standard                   | To reduce viscosity                                                                   | (15 – 25) % |
| VS 35353    | thinner, fast                       | To reduce viscosity with faster drying time                                           | (15 – 25) % |
| VD 35696    | thinner, mild                       | To reduce viscosity (for example acrylic, moulded plastic parts from PC, polystyrene) | (15 – 25) % |
| VZ 35928    | retarder, standard                  | To reduce viscosity                                                                   | (5 – 10) %  |
| VZ 34392    | retarder, slow                      | To reduce viscosity with longer drying time                                           | max. 5 %    |
| VZ 38693    | retarder, mild                      | To reduce viscosity (for example acrylic, moulded plastic parts from PC, polystyrene) | (5 – 10) %  |
| 450JK0004   | Retarding paste                     | To increase drying without change of viscosity                                        | max. 10 %   |
| 450JK0003   | varnish                             | To improve adhesion, but reduces opacity                                              | max. 10 %   |
| 450JK0002   | Raster paste                        | To improve halftone printing, to achieve sharper dots and fine types and lines        | max. 10 %   |
| 100VR133    | Levelling agent, contains silicone  | To improve ink flow, levelling and wetting                                            | 0,5 – 1 %   |
| 100VR1260   | Adhesion modifier, for untreated PP | To improve adhesion onto untreated PP                                                 | (10 - 20) % |

## Ink series 700ST:

| Article No. | Product Name                       | Function                                                                       | Addition    |
|-------------|------------------------------------|--------------------------------------------------------------------------------|-------------|
| VD 38571    | thinner, standard                  | To reduce viscosity                                                            | (15 – 25) % |
| VS 35353    | thinner, fast                      | To reduce viscosity with faster drying time                                    | (15 – 25) % |
| VZ 35928    | retarder, standard                 | To reduce viscosity                                                            | (5 – 10) %  |
| VZ 34392    | retarder, slow                     | To reduce viscosity with longer drying time                                    | max. 5 %    |
| 700ST0003   | varnish                            | To improve adhesion, but reduce of opacity                                     | max. 10 %   |
| 700ST0007   | Raster paste                       | To improve halftone printing, to achieve sharper dots and fine types and lines | max. 10 %   |
| 700ST0014   | Matting powder                     | Matting agent, reduction of gloss level, increase of viscosity                 | max. 10 %   |
| 100VR133    | Levelling agent, contains silicone | To improve ink flow, levelling and wetting                                     | 0,5 – 1 %   |
| 100VR1433   | hardener, standard                 | To improve adhesion and resistance (potlife: 8-12 H at 20°C)                   | 20 %        |
| SE5214      | hardener, fast                     | To improve adhesion and resistance (potlife: 6-8 H at 20°C)                    | 20 %        |
| 100VR1374   | Slip additive                      | To increase mechanical resistance                                              | max. 1%     |

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