

Auxiliary agents and additives for solvent based pad printing inks

Technical data sheet

Additives

1. INTRODUCTION:

We offer a range of pad printing ink series for use in different applications.

Solvent based ink series cannot be used in their original state and always require added ingredients.

It is necessary to adjust the printing viscosity before the start of the decoration and to make further adjustments during the printing process by adding solvents.

Technical problems caused by difficult substrates, ambient conditions and unfavorable printing parameters can be resolved by adding specific auxiliary agents or additives.

Please use them carefully to improve ink properties. Detailed information about additives and auxiliaries for each ink series is given in the corresponding technical data sheets.

All addition quantities are in percentage of weight. Example: 18% to 50 gramm ink = 9 gramm addition

2. HOW TO USE:

2.1 Adjustment of rheological properties:

2.1.1 Viscosity is the measure of flow characteristics and the resistance of a printing ink which is being deformed by shear stress. A high 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 printing viscosity must be adjusted **before** and during the printing process by adding

- **Thinner** and/or
- **Retarder**

The correct viscosity affects: print quality of image, ink transfer from pad, screening and etching depth of the cliché, drying time (dependend on ambient temperature), ink well system (open or closed) and shore hardness of pad.

The adjusted processing viscosity influences the drying time (under normal indoor conditions) and the adhesion to the substrate.

For printing onto substrates like polystyrene, acrylic and moulded plastic parts which are sensitive to cracking we recommend using a **mild** thinner and retarder.

In general, we distinguish between

- **Thinner, standard:** suitable for achieving a processing viscosity with a medium drying time range
- **Thinner, fast:** suitable for achieving a processing viscosity with shorter drying time
- **Thinner, slow:** suitable for achieving a processing viscosity with longer drying time (higher evaporation value of solvent). By adding thinner the solvent properties of the binder and therefore the adhesion to substrate will be changed.
- **Retarder:** reduces printing viscosity. Can be used for the slowest of printing speeds. Adding retarder slows down the drying of ink on the pad.

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, stirring).

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

2.2. Optimization of Ink properties:

2.2.1 Ink flow (levelling) improvement:

Poor ink levelling or ink flow can be caused by bad wetting properties or unsuitable surface tension of the substrate. This manifests itself in pinholes or "orange peel" effects and can be remedied by adding more thinner and/or levelling agent.

There are levelling agents available which contain silicone. The amount added should not exceed 1%. Please note that the addition of silicone can affect the ink adhesion when overprinting.

2.2.2 Hardener:

Ink series are available as 1-component and 2-component versions.

To optimize mechanical and chemical resistance the addition of hardener is recommended.

Please note that the final chemical and physical resistance for ink series T38 is only achieved after 36 hours at an ambient temperature of 20°C or 48 hours at an ambient temperature of 20°C

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In general, we distinguish between

- **Hardener, standard:**
100VR1433

During the processing and drying of the printed ink, the temperature should not be lower than 15°C otherwise the chemical cross linking is stopped. High humidity should be avoided for several hours after printing as the hardener is moisture sensitive. At an ambient temperature of 20°C, a pot life of approximately 8 - 12 hours can be achieved.

- **Hardener, for outdoor usage:**
100VR1491

For improved outdoor resistance, the use of hardener 100VR1491 is recommended. It is less reactive than standard hardener, therefore the drying time is extended. At an ambient temperature of 21°C, the pot life is approx. 16 hours.

When using hardener, please note that multi-colour jobs have to be printed within 24 hours. The completely dried ink cannot be overprinted.

2.2.4 Adhesion modifier:

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

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

Adhesion modifier for untreated PP: 100VR1260

Primer for untreated PP: 100VR1237

Adhesion modifier for glass: 100VR1494

Adhesion modifier for glass: 100VR1410

2.2.5 Special ink effects (matt/gloss):

The use of matt additive (powder) modifies the gloss level from gloss to matt. Then higher the percentage of matt powder, the higher the matt level.

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

2.2.6 Other additives:

- **Slip additive:**
100VR1495

To increase mechanical resistance we recommend adding a maximum of 1% slip agent 100VR1495.

3. SHELF LIFE:

At a temperature of 21°C we guarantee a shelf life for

Hardener	of min. 12 months
Adhesion modifier/Primer	of min. 12 months
Thinner	of min. 12 months
Retarder	of min. 12 months
Matting powder	of min. 12 months
Thixotropic agent	of min. 12 months
Thixotropic paste	of min. 12 months

when stored in the original packing container.

At higher storage temperatures the shelf life will be reduced.

Additives applied in ink series such as 110GE0070 achieved the shelf life mentioned in the technical data sheets for the named ink series.

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4. OVERVIEW of auxiliaries and agents:

Ink series 110GE:

Article No.	Product Name	Function	Addition
38571	Thinner, standard	Reduces viscosity	15 – 25%
35353	Thinner, fast	Reduces viscosity with shorter drying time	15 – 25%
35928	Retarder, standard	Reduces viscosity	5 – 10%
34392	Retarder, slow	Reduces viscosity with longer drying time	2 – 5%
110GE0070	Varnish	Improves adhesion, but reduces opacity	2 – 10%
110GE0081	Raster paste	Improves halftone printing, to achieve sharper dots and fine types and lines	2 – 10%
100VR1494	Adhesion modifier, for glass	Improves ink adhesion to the substrate With oven drying (25 min at 180°C)	0.5 – 2%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0.5 – 1%
100VR1495	Slip additive	Increases mechanical resistance	0.5 – 1%

Ink series T01:

Article No.	Product Name	Function	Addition
38571	Thinner, standard	Reduces viscosity	15 – 25%
35353	Thinner, fast	Reduces viscosity with shorter drying time	15 – 25%
100VR1390	Thinner, for glass	Reduces viscosity	15 – 25%
35696	Thinner, mild	Reduces viscosity (e.g. acrylic, moulded plastic parts from PC, polystyrene)	15 – 25%
35928	Retarder, standard	Reduces viscosity	5 – 10%
34392	Retarder, slow	Reduces viscosity with longer drying time	2 – 5%
100VR1170	Retarder, for glass	Reduces viscosity	10 – 20%
100VR1482	Retarder, mild	Reduces viscosity (e.g. acrylic, moulded plastic parts from PC, polystyrene)	5 – 10%
T01-0026	Varnish	Improves adhesion, but reduces opacity	2 – 10%
100VR1194	Matting powder	Matting agent, reduces gloss level, increases viscosity	5 – 8%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0.5 – 1%
100VR1433	Hardener, standard	Improves adhesion and resistance. Pot life: 8 – 12 hours at 21°C	2 – 20%
100VR1494	Adhesion modifier, for glass	Improves ink adhesion to the substrate With oven drying (25 min at 180°C)	2 – 5%
100VR1410	Adhesion modifier, for glass	Improves ink adhesion to the substrate Without oven drying	2 – 7%
100VR1495	Slip additive	Increases mechanical resistance	0.5 – 1%

Serie T25:

Article No.	Product Name	Function	Addition
100VR1370	Thinner, standard	Reduces viscosity	10 – 20%
38571	Thinner, fast	Reduces viscosity with shorter drying time	10 – 20%
35928	Retarder, standard	Reduces viscosity	2 – 5%
T25-0001	Thinner	Improves adhesion, but reduces opacity	2 – 10%
100VR1194	Matting powder	Matting agent, reduces gloss level, increases viscosity	5 – 8%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0.5 – 1 %
100VR1495	Slip additive	Increases mechanical resistance	0.5 – 1%

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Serie T28:

Article No.	Product Name	Function	Addition
100VR1390	Thinner, for glass	Reduces viscosity	10 – 20%
T28-0002	Varnish	Improves adhesion, but reduces opacity	2 – 10%
100VR1194	Matting powder	Matting agent, reduces gloss level, increases viscosity	5 – 8%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0,5 – 1%
100VR1494	Adhesion modifier, for glass	Improves ink adhesion to the substrate With oven drying (25 min at 180°C)	2 – 5%
100VR1410	Adhesion modifier, for glass	Improves ink adhesion to the substrate Without oven drying.	2 – 7%
100VR1495	Slip additive	Increases mechanical resistance	0.5 – 1%

Serie T35:

Article No.	Product Name	Function	Addition
100VR1406	Thinner, standard	Reduces viscosity	15 – 25%
100VR1279	Thinner, fast	Reduces viscosity with shorter drying time	15 – 25%
100VR1450	Thinner, slow	Reduces viscosity	15 – 25%
100VR1445	Retarder	Reduces viscosity (mixed with thinner)	5 – 10%
100VR1445	Retarder	Reduces viscosity (only retarder)	15 – 25%
T35-0027	Varnish	Improves adhesion, but reduces opacity	2 – 10%
100VR1194	Matting powder	Matting agent, reduces gloss level, increases viscosity	5 – 8%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0.5 – 1%

Ink series T38:

Article No.	Product Name	Function	Addition
38571	Thinner, standard	Reduces viscosity	15 – 25%
35353	Thinner, fast	Reduces viscosity with shorter drying time	15 – 25%
35928	Retarder, standard	Reduces viscosity	5 – 10%
34392	Retarder, slow	Reduces viscosity with longer drying time	2 – 5%
T38-0026	Retarding paste	Increases drying, viscosity remains unchanged	2 – 10%
T38-0017	Varnish	Improves adhesion, but reduces opacity	2 – 10%
100VR1194	Matting powder	Matting agent, reduces gloss level, increases viscosity	5 – 8%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0.5 – 1%
100VR1433	Hardener, standard	Improves adhesion and resistance Pot life: 8 – 12 hours at 21°C	50%
100VR1491	Hardener, weatherproof	Improves adhesion and resistance Pot life: 12 – 14 hours at 21°C	50%

Serie T120:

Article No.	Product Name	Function	Addition
100VR1279	Thinner, standard	Reduces viscosity	15 – 25%
100VR1185	Thinner, fast	Reduces viscosity with shorter drying time	15 – 25%
100VR1322	Thinner, slow	Reduces viscosity with longer drying time	5 – 10%
T120-0007	Varnish	Improves reactivity and adhesion, reduces opacity	2 – 10%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0.5 – 1%
100VR1433	Hardener	Improves adhesion and resistance Pot life: 12 hours at 21°C	2 – 10%

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Serie T200:

Article No.	Product Name	Function	Addition
100VR1450	Thinner, standard	Reduces viscosity	25 – 35%
100VR1440	Thinner, fast	Reduces viscosity with shorter drying time	25 – 35%
100VR1453	Thinner, slow	Reduces viscosity with longer drying time	25 – 35%
T200-0001	Verschnitt	Improves reactivity and adhesion, reduces opacity	2 – 10%
100VR133	Levelling agent, contains silicone	Improves ink flow, levelling and wetting	0.5 – 1%
100VR1433	Hardener	Improves adhesion and resistance Pot life: 12 hours at 21°C	Max. 20%
100VR1491	Hardener, weatherproof	Improves adhesion and resistance Pot life: 12 – 14 hours at 21°C)	Max. 20%
100VR1495	Slip additive	Increases mechanical resistance	0,5 – 1%

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