



# Inks



# INK USE INFORMATION

## THE PAD PRINTING PROCESS

The basic principle of the pad printing process is that the ink becomes tacky due to evaporation, first in the cliché before ink pick-up and then on the pad. This effect is used to transfer the ink from the cliché to the pad and then from the pad to the workpiece.

### 1. Pre-treatment of polyolefines

To obtain an optimum ink adhesion on polyolefine, polyethylen (PE) and polypropylen (PP), materials must be pre-treated. The surface tension must be at least 38 Dyn = 0.038 N / m. The surface tension can be tested using the test pen (see accessories list on our website), which is filled with ink adjusted to exactly this value. If the surface tension is below 0.038 N / m, more intense pre-treatment is needed. The possibilities for pre-treatment are flaming, corona or primer / adhesion promoter MT.

### 2. Post-treatment of polyoxides

Another group of materials that require extra measures for good ink adhesion are polyoxides, e.g. acetyl resin, delrin, Hostaform C etc. After the print the materials must be subjected to a thermal shock to achieve a chemical reaction of the ink with the material surface. The thermal shock should be approx. 350 °C and can be generated with a flaming or thermodiffusion (hot-air) unit.

### 3. Curing time

2-component inks usually require 2 – 6 days for chemical curing. After this time, an optimum adhesion, chemical resistance and abrasion resistance are achieved. However, with that in mind, further work with the printed parts (e.g. packaging or part assembly) is possible once the part is dry to the touch, as long as the image is not altered by a sharp or rough surface. See "ink and hardener properties" chart.

### 4. Chemical resistance

1-component inks never achieve the same chemical resistance as 2-component inks. 1-component inks are mainly used on materials which are easily etched by the mixed ink. In this case the substrate has no better chemical properties resistance than the printed 1-component ink itself.

### 5. Abrasion resistance

When high abrasion resistance is required, 2-component inks should be used.

### 6. The viscosity process

All inks must be adjusted to the correct viscosity. With 2-component inks, it is critical that ink and hardener are thoroughly mixed prior to adding thinner. If this is not observed, lumps of concentrated hardener remain resulting in partial curing of the ink, which has an adverse effect on the subsequent ink transfer and adhesion. The desired working viscosity is achieved through the addition of thinner in small amounts while constantly stirring. If thinner is added all at once or in large quantities, the ink pigments are washed out of the resin. This is called ink pigment shock and the ink will be flaky and unusable. During printing, thinner evaporates and the ink thickens. Therefore, thinner must be replaced in regular intervals; once again in small quantities. As for the open ink well system, the thinner is mixed with the ink using a spatula after the doctor blade has been removed. Ink viscosity adjustment depends on the ink colour tone. Certain pigments cause thixotropic reactions. Both thixotropic and high-density inks can not be tested with the Visco-spatula. If you reach good printing results with a particular ink, put some of it into a mixing cup, stir it well, and test the viscosity. Keep note of your test results for when you next use the same ink again.

### 7. Use of retarders

Usually, ink viscosity should be only adjusted using thinner. If there are exceptional environmental influences, such as high room temperatures, drafts, prolonged cycle times among other things, retarder can be added in controlled quantities. We recommend to produce a quantity of your own custom retarder out of thinner and retarder, for example mixed 4:1, and use it to adjust ink viscosity.

### 8. Flow agent

Flow agent is used to reduce the ink's surface tension. Flow agent contains silicone and therefore only small quantities should be added, approx. 1 drop / 10 g ink. Remember that flow agent reduces ink adhesion!

### 9. Pot life

2-component ink systems cause a chemical reaction. Pot life is reduced by high room temperatures and a high relative air humidity (RAH).

## MIXING SYSTEMS, RECIPES AND INK RANGE

### Mixing Systems

For all ink ranges, mixing systems are available.

### Recipes

We have recipes for over 1000 colour shades available free of charge. **All colour recipes are based on printing made on white backgrounds.** Data can be ordered for HKS, RAL and PMS. Please ask for our recipe catalogue (or download the pdf from [www.teca-print.com](http://www.teca-print.com)).

For printing onto **dark substrates, transparent objects and mirror areas**, special shade recipes need to be formulated. For this we require the exact colour reference of the desired ink tone (PMS, HKS, RAL or a sample) and the colour shade of the substrate (preferably a sample).

### Ink range (HD = extra opaque inks)

All ink types are available only in NT pigmentations and conform to EN 71, part 3, safety of toys, migration of certain elements.

| Ink ref.                          | TPC 118 | TPC 180    | TPC 301    | TPC 320    | TPC 528 | TPC 508         | TPC 200 | TPC 230 | TPC 250 | TPC 270    | TPC 728 | TPC 760 |
|-----------------------------------|---------|------------|------------|------------|---------|-----------------|---------|---------|---------|------------|---------|---------|
| System                            | 1-C-ink | 1-C 2-C    | 1-C 2-C    | 1-C 2-C    | 1-K 2-K | 2-component ink |         |         |         |            | UV-inks |         |
| <b>STANDARD INK TONES</b>         | HD      | x          | ---        | x          | HD      | HD              | x       | x       | x       | x          | ---     | ---     |
| <b>METALLIC TONES</b>             | HD      | x          | 76/79      | 76/79      | HD      | HD              | x       | x       | x       |            | 76/79   | 76/79   |
| <b>PROCESS COLOURS</b>            | x       | x          | x          | x          | x       |                 | x       | x       | x       | on request | x       | x       |
| <b>FLUORESCENT COLOURS</b>        | x       | x          | on request | ---        | x       | x               | ---     | ---     | ---     | ---        | ---     | ---     |
| <b>HD-Syst. avail. separately</b> |         | x          | ---        | x          | ---     | ---             | x       | x       |         |            | ---     | ---     |
| <b>MIXING SYSTEMS</b>             | PC - HD | GF/1 o. 2K | MF/1 u. 2K | GF/1 o. 2K | PC - HD | PC - HD         | GF/2K   | GF/2K   | GF/2K   | GF/2K      | PC      | GF      |

## 1-COMPONENT INKS

### **TPC 118** *Highly opaque silk gloss pad printing ink for the printing of various kinds of plastic materials*

like hard and soft **PVC**, coated polyester and **PET-G**, polystyrene and its modifications such as **ABS**, **ASA**, **SAN**, acrylic glass **PMMA** and polycarbonate **PC**, pretreated polyolefine **PP** and **PE**, manifold coated surfaces and layers as well as cellulose acetate **CA** and **CAB**, papers and cardboard products.

Properties very highly opaque, excellent fluidity, may be applied for open and closed machine system, quick drying.

## 1/2-COMPONENT INKS

### **TPC 180** *Most universal pad printing ink, opaque*

suitable for thermoplastic materials as well as duroplastics, wood, paper and metals.

Properties excellent opacity (HD version). User-friendly and quick-drying processing in open and sealed ink well systems and for rotary printing. Glossy finish.

### **TPC 301** *a printing ink free from cyclohexanone and aromatic compounds, for universal use on a wide range of substrates*

especially suitable on polystyrene **PS** and its modifications such as **ABS**, **ASA**, **SAN**, on **PC**, **PBTP**, **CA**, **CAB**, **PMMA**, **PVC** rigid, on 1-k- and in some cases on UV-lacquers, wood and paper.

Properties Weatherproof, glossy, fast and flexible drying pad printing ink with a excellent printability. Especially suitable for printing on toys and the outside of food packaging.

### **TPC 320** *Universal, stable pad printing ink, very glossy*

suitable for thermoplastic materials, especially **ABS**, **PS** and its co-polymerisates **ABS**, **ASA**, **SAN**, hard **PVC**, **PMMA** and polycarbonate **PC**. On polyester, polyamide **PA** and other duroplasts pre-treatment may be necessary.

Properties Very user-friendly. Weather-, petrol- and alcohol-resistant, this can even be improved by adding hardener. Glossy finish.

### **TPC 528** *Highly opaque, silk gloss pad printing ink for the printing of various kinds of soft and hard plastic materials and metals.*

suitable for various kinds of plastic materials such as hard and soft **PVC**, coated polyester and **PET-G**, polyamide and polyetherimide, polystyrol **PS** and its modifications such as **ABS**, **ASA**, **SAN**, etc. acrylic glass **PMMA** and polycarbonate **PC**, pretreated polyolefine **PE** / **PP**, tyvek, manifold coated surfaces and layers as well as cellulose acetate **CA** and **CAB**, papers and cardboards like various metals, aluminium, compound materials such as alucobond, dibond and vekaplan AL.

Properties excellent fluidity, may be applied for open and closed machine system, quick drying.

## 2-COMPONENT INKS

### **TPC 508** *Highly opaque, silk gloss pad printing ink for the printing of various kinds of soft and hard plastic materials and metals.*

suitable for various kinds of plastic materials such as hard **PVC**, **PET** modifications (-**A**,-**E**,-**P**), polyamide **PA** and polyetherimide **PEI**, polystyrol **PS** and **ABS**, **SAN**, etc., acrylic glass (**PMMA**) and polycarbonate **PC**, pretreated polyolefine **PE/PP**, tyvek, manifold coated surfaces and layers as well as cellulose acetate **CA** and **CAB**, papers and cardboards, multi-coated surfaces and coatings, metals, aluminium and aluminium composites, such as alucobond, dibond and vekaplan AL, wood and polyacetate (**POM**) with follow-up flaming, glass.

Properties excellent fluidity, may be applied for open and closed machine system.

### **TPC 200**

#### *Highly resistant, glossy pad printing ink*

Used in the technical industries and graphic fields for cellulose acetate **CA**, polyamide **PA**, polyester, acetyl resins (post-treated) **POM**, pre-treated polypropylene **PP**, thermoplastics, metals and varnished substrates (also for powder coated and 2 component painted surfaces).

Properties

Quick drying ink system with good adhesion, glossy finish. Good opacity (excellent in HD version).

### **TPC 230**

#### *Pad printing ink with maximum resistance*

Best adhesion characteristics with thermoplastics, varnished surfaces, metals, NE-metals, polyamide **PA**, polycarbonate **PC**, polyester, polymethacrylate **PMMA**, polyurethane **PUR** and hard **PVC**. Used for industrial and advertising applications.

Properties

Quick drying and glossy. High chemical resistance against organic solvent, chemicals, thinned alkalis and acids. The resistance against mechanical abrasion is substantially better compared to TPC 200. Good opacity (excellent in HD)

### **TPC 250**

#### *Glossy pad printing ink for glass and bottle printing*

Excellent ink for use on thermosets including, ceramics, metals; including chromed, nickel, gilded or rhodanised surfaces.

Properties

When mixed with HG, HH or HI hardeners, a perfect adhesion is achieved with curing or air drying depending on the harder used. Very high chemical and mechanical resistance. High colour brilliance.

### **TPC 270**

#### *high resistance, sterilizable pad printing ink, glossy*

suitable for duroplastics, epoxy resins. Lacquered bottles, diverse metals and thermoplastics.

Properties

Suitable for medical sterilizaion up to 140 °C / 1 hour, quick drying, glossy. Highly chemical and weather resistant. Very highly opaque (HD).

## UV-CURING INKS

### **TPC 728**

#### *high gloss UV-curing pad printing ink for decorating a vast array of plastics*

pre-treated polyolefins **PP** / **PE**, rigid-**PVC**, polystyrene **PS** and its derivates such as; **ABS**, **SAN**, etc., **PMMA**, polycarbonate **PC**, polyamide **PA** (also glass-filled), and partly **PET**-materials, as well as duroplastic. Also suitable for various coated surfaces and works on some metals.

Properties

fast curing and extremely high resistance, similar or better than 2-component solvent based inks.

### **TPC 760**

#### *UV-curing pad printing ink for printing onto pre-treated polypropylene*

suitable for **PVC**, **PC**, **PET**, styrene and its copolymers **PS**, **SB**, **ABS**, **SAN** and **ASA**.

Properties

The TPC 760 ink cures to a hard, rough ink layer, and is suitable for printing on hard material substrates only.



# USING THE VISCOSPATULA

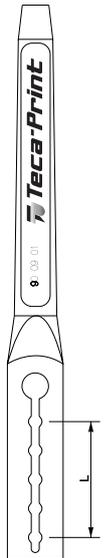
## Instructions:

1. **Stir** the ink to ensure thorough mixing of the pigments.
2. Place the Teca-Print mixing cup in the Teca-Print **cup holder**.
3. Pour the required amount of ink into a **mixing cup**.
4. Add **thinner** drop by drop whilst constantly stirring.
5. Dip the VISCOSPATULA into the cup so that half of the **large / top hole** in the VISCOSPATULA is immersed in ink.
6. Lift the VISCOSPATULA **vertically** out of the ink.
7. As the ink flows down the VISCOSPATULA, watch how the holes open up from top to bottom. The amount of time it takes for the ink to flow from the first small hole to the bottom (fifth) small hole (= measuring distance "L" on chart) indicates the **viscosity** (velocity of flow) of the ink. Measure the **flow time** with a wrist watch. Experience indicates that a time of about **8 seconds** is advisable although this can vary slightly depending on ink type, colour and particular ink usage.

## Hints:

If the **flow time is too quick**, then the ink is too thin, the addition of unthinned ink will thicken it up. If the **flow time is longer**, thinner should be added in small quantities at a time whilst stirring.

If the ink behaves **thixotropically** (e.g. some ink tones with blue) the VISCOSPATULA is not reasonably applicable. Such ink tones are usually adjustable with 8 – 10 % solvent addition.



L = measuring distance

# INK AND ADDITIVE ORDERING INFORMATION

## Inks

Our extensive range of inks is supplied in 1 l cans. Most inks are also available in practical 200 ml tubes. **Fluorescent tones** (TPC 180) are only available in 1 l cans. Delivery time: about 4 weeks. The inks types TPC 118, 508 and 528 are available in 500 gr cans. Delivery time: about 1 week. **Metal colour inks** are only available on demand.

## Additives

**Hardener** is available in 100 ml tubes and 1 l cans. All **solvents** and **special additives** are supplied in 1 l cans, some are also available in 5 l cans or 25 l barrels. Please refer to the table below for order numbers.

| DESCRIPTION | ORDER NO.     |                | DELIVERY       |
|-------------|---------------|----------------|----------------|
|             | 200 ml - Tube | 1l / 1kg - Can |                |
| <b>INKS</b> |               |                |                |
| TPC 118     | F11 xx0xx 2   | F11 xx0xx 6    | from stock     |
| TPC 180     | F18 xx8xx 2   | F18 xx8xx 4    | from stock     |
| TPC 301     | F30 xx8xx 2   | F30 xx8xx 4    | from stock     |
| TPC 320     | F32 xx8xx 2   | F32 xx8xx 4    | from stock     |
| TPC 528     | F52 xx0xx 2   | F52 xx0xx 6    | from stock     |
| TPC 508     | F50 xx0xx 2   | F50 xx0xx 6    | from stock     |
| TPC 200     | F20 xx8xx 2   | F20 xx8xx 4    | from stock     |
| TPC 230     | F23 xx8xx 2   | F23 xx8xx 4    | from stock     |
| TPC 250     | F25 xx8xx 2   | F25 xx8xx 4    | from stock     |
| TPC 270     | ---           | F27 xx8xx 4    | upon request * |
| TPC 728     | ---           | F72 xx0xx 6    | upon request * |
| TPC 760     | ---           | F76 xx8xx 4    | upon request * |

| DESCRIPTION     | ORDER NO.     |             | DELIVERY   |
|-----------------|---------------|-------------|------------|
|                 | 100 ml - Tube | 1 l - Can   |            |
| <b>HARDENER</b> |               |             |            |
| HA              | F98 00023 1   | F98 00023 6 | from stock |
| HB              | F98 00024 1   | F98 00024 6 | from stock |
| HG              | F91 00021 1   | F91 00021 4 | from stock |
| HH              | F91 00025 1   | F91 00025 4 | from stock |
| HI              | F91 00026 1   | F91 00026 4 | from stock |
| HM              | F98 00021 1   | F98 00021 6 | from stock |
| HN              | F91 00022 1   | F91 00022 4 | from stock |
| HP              | F94 00021 1   | F94 00021 4 | from stock |
| HR              | F91 00024 1   | F91 00024 4 | from stock |
| HV              | F98 00022 1   | F98 00022 6 | from stock |
| HW              | F94 00022 1   | F94 00022 4 | from stock |

\* upon request, about 2 – 4 weeks delivery time

\*\* is not to be added to the ink

AS = antistatic agent AP = antistatic paste PV = retarder paste MP = matt powder  
MT = bonding additive MV = flow agent PP = adhesion promoter

| DESCRIPTION     | ORDER NO.   |             |                    | DELIVERY   |
|-----------------|-------------|-------------|--------------------|------------|
|                 | 1 l - can   | 5 l - can   | 25l / 30l - barrel |            |
| <b>THINNERS</b> |             |             |                    |            |
| VC              | F94 00002 4 | F94 00002 5 | ---                | from stock |
| VD              | F91 00001 4 | F91 00001 5 | F91 00001 8*       | from stock |
| VF              | F91 00004 4 | ---         | ---                | from stock |
| VG              | F91 00005 4 | ---         | ---                | from stock |
| VM              | F98 00001 4 | F98 00001 5 | F98 00001 8*       | from stock |
| VN              | F91 00007 4 | F91 00007 5 | ---                | from stock |
| VO              | F98 00003 4 | F98 00003 5 | F98 00003 8*       | from stock |
| VP              | F98 00002 4 | F98 00002 5 | F98 00002 8*       | from stock |
| VQ              | F98 00005 4 | ---         | ---                | from stock |
| VR              | F98 00004 4 | F98 00004 5 | F98 00004 8*       | from stock |
| VS              | F91 00002 4 | F91 00002 5 | ---                | from stock |
| VT              | F91 00006 4 | ---         | ---                | from stock |
| VV              | F94 00003 4 | ---         | ---                | from stock |
| VW              | F94 00001 4 | ---         | ---                | from stock |
| VX              | F91 00003 4 | ---         | ---                | from stock |

| RETARDERS |             |             |              |                |
|-----------|-------------|-------------|--------------|----------------|
| ZF        | F94 00011 4 | ---         | ---          | from stock     |
| ZG        | F91 00012 4 | ---         | ---          | from stock     |
| ZM        | F98 00011 4 | F98 00011 5 | F98 00011 8* | from stock     |
| ZU        | F98 00012 4 | F98 00012 5 | F98 00012 8* | upon request * |
| ZW        | F94 00012 4 | ---         | ---          | from stock     |

| CLEANERS |             |             |              |                |
|----------|-------------|-------------|--------------|----------------|
| RE       | F91 00031 4 | F91 00031 5 | F91 00031 8* | from stock     |
| RA       | F99 00031 4 | F99 00031 5 | F99 00031 8* | from stock     |
| RB       | F98 00032 4 | ---         | ---          | upon request * |

| ADDITIVES |             |     |     |                |
|-----------|-------------|-----|-----|----------------|
| AS        | F98 00041 4 | --- | --- | from stock     |
| AP        | F91 00047 4 | --- | --- | upon request * |
| PV        | F91 00015 4 | --- | --- | upon request * |
| MP        | F91 00042 4 | --- | --- | upon request * |
| MT **     | F91 00043 4 | --- | --- | from stock     |
| MV        | F91 00044 4 | --- | --- | from stock     |
| PP        | F94 00045 4 | --- | --- | upon request * |

xx: to order, please use the following number format:

**standard ink tone:** F32 31800 2 F32 = TPC 320, 31 = Blue 31-NT, 00 = Standard ink tone, 2 = 200 ml tube  
**GF mixing system:** F18 92805 4 F18 = TPC 180, 92 = GF-mixing system, 05 = GF-mixing system ink GF-05 (magenta), 4 = 1 l can  
**MG mixing system:** F30 92809 4 F30 = TPC 301, 96 = MF-mixing system, 09 = MF-mixing system ink MF-11 (green), 4 = 1 l can  
**special ink orders:** F20 00107 4 F20 = TPC 200, special shade Nr. 00107-NT, 4 = 1 l can

# USE OF ADDITIVES

| ADDITIVES                        | Ink ref.                        | System            | TPC 118             | TPC 180    | TPC 301      | TPC 320   | TPC 528             | TPC 508     | TPC 200             | TPC 230             | TPC 250             | TPC 270             | TPC 728                       | TPC 760                       |  |
|----------------------------------|---------------------------------|-------------------|---------------------|------------|--------------|-----------|---------------------|-------------|---------------------|---------------------|---------------------|---------------------|-------------------------------|-------------------------------|--|
|                                  |                                 |                   | 1-C-ink             | 1-C 2-C    | 1-C 2-C      | 1-C 2-C   | 1-C 2-C             | 1-C 2-C     | 2-component ink     |                     |                     |                     |                               | UV-inks                       |  |
|                                  |                                 |                   | Special             | versatile  | **           | versatile | versatile           | versatile   | versatile           | incr. resistance    | glass ink           | sterilisierbar      | versatile                     | PP-ink                        |  |
| HARDENER (1)                     | UV-resistant                    | HA                | 10:1 <sup>(2)</sup> |            |              |           | 0 ... 5:1           | 4:1         |                     |                     |                     |                     | 500-1000 mJ/cm <sup>2</sup> * | 750-1500m J/cm <sup>2</sup> * |  |
|                                  | UV-resistant                    | HB                | 10:1 <sup>(2)</sup> |            |              |           | 0 ... 5:1           |             |                     |                     |                     |                     |                               |                               |  |
|                                  | oven cured glass hardener       | HG                |                     |            |              |           |                     |             |                     |                     | 20:1                |                     |                               |                               |  |
|                                  | glass hardener                  | HH                |                     |            |              |           |                     |             |                     |                     | 20:1                |                     |                               |                               |  |
|                                  | glass hardener                  | HI                |                     |            |              |           |                     |             |                     |                     | 20:1                |                     |                               |                               |  |
|                                  |                                 | HM                | 10:1 <sup>(2)</sup> |            |              |           | 0 ... 5:1           | 4:1         |                     |                     |                     |                     |                               |                               |  |
|                                  |                                 | HN                |                     | 10:1       |              | 10:1      |                     |             | 4:1                 | 2:1                 |                     | 4:1                 |                               |                               |  |
|                                  | UV-resistant                    | HR                |                     | 10:1       |              | 10:1      |                     |             |                     |                     |                     | 4:1                 |                               |                               |  |
| glass hardener                   | HW                              |                   |                     |            |              |           | 20:1                |             |                     |                     |                     |                     |                               |                               |  |
|                                  |                                 | HW                |                     |            | 100:7        |           |                     |             |                     |                     |                     |                     |                               |                               |  |
| Pot life in h <sup>(3)</sup>     |                                 |                   | > 12                | > 8 ... 10 | 12 h / 21 °C | > 8       | > 8 ... 16          | > 8         | 8                   | 6 / 4               | 8 ... 12            | 8                   | ---                           | ---                           |  |
| THINNERS                         | Evaporation rate (4) f          |                   |                     |            |              |           |                     |             |                     |                     |                     |                     |                               |                               |  |
|                                  | ~ 40                            | 1                 | VC                  |            |              |           |                     |             |                     |                     |                     |                     |                               |                               |  |
|                                  | ~ 40                            | 1                 | VD                  | x          |              | x         |                     |             | x                   | x                   |                     | x                   |                               | x                             |  |
|                                  | ~ 25                            | 0.6               | VF                  | x          |              | x         |                     |             | x                   | x                   |                     | x                   |                               |                               |  |
|                                  | ~ 200                           | 5                 | VG                  | x          |              | x         |                     |             | x                   | x                   | x                   | x                   |                               | x                             |  |
|                                  | ~ 20                            | 0.5               | VS                  | x          |              |           |                     |             | x                   | x                   | x                   | x                   | x                             | x                             |  |
|                                  | ~ 25                            | 0.6               | VX <sup>(6)</sup>   |            | PS / PMMA    |           | PS / PMMA           |             |                     |                     |                     | x                   |                               |                               |  |
|                                  | ~ 40                            | 1                 | VM                  | x          |              |           |                     | x           | x                   |                     |                     |                     | x                             |                               |  |
|                                  | ~ 40                            | 1                 | VN                  |            | x            |           | x                   |             | x                   | x                   |                     |                     | x                             |                               |  |
|                                  | ~ 20                            | 0.5               | VO                  | x          |              | x         |                     | x           | x                   | x                   |                     |                     | x                             |                               |  |
|                                  | ~ 12                            | 0.5               | VV                  |            |              | x         |                     |             |                     |                     |                     |                     |                               |                               |  |
|                                  | ~ 70                            | 1.75              | VW                  |            |              | x         |                     |             |                     |                     |                     |                     |                               |                               |  |
|                                  | ~ 10                            | 0.25              | VT                  |            | x            |           | x                   |             |                     | x                   |                     | x                   |                               |                               |  |
|                                  | ~ 40                            | 1                 | VP <sup>(5)</sup>   |            | PS/ABS/SAN   |           |                     |             |                     | x                   | x                   | x                   | x                             |                               |  |
|                                  | ---                             | ---               | VQ <sup>(6)</sup>   |            | Plexi / PMMA |           |                     |             |                     |                     |                     |                     |                               |                               |  |
| ~ 15                             | 0.4                             | VR <sup>(7)</sup> | x                   |            | x            |           | x                   | x           |                     |                     |                     |                     |                               |                               |  |
| RETARDERS (11)                   | ~ 1000                          | 25                | ZF                  |            |              |           |                     |             |                     |                     |                     |                     |                               |                               |  |
|                                  | ~ 1000                          | 25                | ZG                  |            | x            |           | x                   |             | x                   | x                   | x                   | x                   |                               |                               |  |
|                                  | ~ 190                           | 5                 | ZW                  |            |              | x         |                     |             |                     |                     |                     |                     |                               |                               |  |
|                                  | ~ 500                           | 12                | ZD                  |            |              |           | for precision print |             | for precision print | for precision print | for precision print | for precision print |                               |                               |  |
|                                  | ~ 900                           | 22                | ZM                  | x          |              | x         |                     | x           | x                   |                     |                     |                     |                               |                               |  |
|                                  | ~ 100                           | 2.5               | ZU                  | x          |              | x         |                     | x           | x                   |                     |                     |                     |                               |                               |  |
| GENERAL ADDITIVES (10)           | Anti-static agent               | AS/AM             | 0,5 ... 1 %         | x          |              |           | x                   | 0,5 ... 1 % |                     | 0,5 ... 1 %         |                     |                     |                               | not recommended               |  |
|                                  | Antistatikpaste                 | AP                | 5 ... 10 %          | 5 ... 10 % |              |           | 5 ... 10 %          | 5 ... 10 %  |                     | 5 ... 10 %          |                     |                     |                               | 5 ... 10 %                    |  |
|                                  | retarder paste                  | PV                | 5 ... 10 %          | 5 ... 10 % |              |           | 5 ... 10 %          | 5 ... 10 %  |                     | 5 ... 10 %          |                     |                     |                               |                               |  |
|                                  | Matt powder                     | MP                | 3 ... 6 %           | 3 ... 6 %  | 3 ... 6 %    | 3 ... 6 % | 3 ... 6 %           |             |                     | 3 ... 6 %           |                     |                     |                               |                               |  |
|                                  | Bonding additive <sup>(8)</sup> | MT                |                     |            |              |           |                     |             |                     |                     | x                   |                     |                               |                               |  |
|                                  |                                 | MD                |                     |            | x            |           |                     |             |                     |                     |                     |                     |                               |                               |  |
|                                  | Flow agent                      | MV                | max 1%              | max. 1%    |              |           | max 1% !            | max 1%      |                     |                     | max 1%              |                     |                               |                               |  |
| Adhesion promoter <sup>(9)</sup> | PP                              | x                 | x                   |            |              | x         | x                   |             |                     |                     |                     |                     |                               |                               |  |

| CLEANERS | Flash point > 25°C | RE | for cleaning all accessories |
|----------|--------------------|----|------------------------------|
|          | Flash point < 20°C | RA |                              |
|          | Flash point > 75°C | RB |                              |

- Hardener** must be used in an appropriate ratio to the ink. Strong deviations from the noted ratios above can lead to problems. Some problems may take a while to show and can eventually affect resistance and adhesion. **Thus, after adding hardener and then thinner – this order is very important – the mixture should rest for approx. 15 minutes** so that optimum ink flow and adhesion are achieved.
- Hardener** only to increase the chemical resistance.
- Pot life** can be reduced by approx. half for metal colour tones. With some ink types, pot life depends on a direct relationship to room-temperature (RT) and relative air humidity (RAH).
- Evaporation rate:** the lower the value, the faster the evaporation, **f** = relative evaporation rate compared to VC and VD.
- Thinner VP** increases ink adhesion onto polystyrol and related materials.
- Extremely mild thinner to protect PMMA and polystyrene (molded pieces) from stress or tension cracks. The thinner VX does not etch into the surface and as a result can also be used as a cleaner.
- Thinner VR** contains **XYLOL** and cannot be classified as non-hazardous like the other solvents. The **flash point** is < 0°, extra care is to be taken due to **flammability!**
- Adhesion promoter MT** is not to be added to the ink. Pre-treatment e.g. via wiping objects with an MT-soaked cloth, spraying or dipping them. **Bonding additive MD** is a printable "in line" variation of the MT bonding additive and is applied as a single hit prior to the ink application.
- Bonding additive MT** should be added in 10 – 20 % quantities. It does not alter pot life, but does reduce resistance values.
- General additives** can be used for all ink types except for oven cured inks, UV inks and TPC 301.
- Retarder agents** are used for more specialized applications in which a defined thinner-retarder ratio is used.
  - \* requires UV-Light exposure (mJ / cm<sup>2</sup>) in order to fully cure the ink.
  - \*\* free of cyclohexanone and condiments **x** = suitable

**PLEASE READ THE TECHNICAL DATA SHEETS ON PAD PRINTING INKS AND ADDITIVES**

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You will find more information about the ink and hardener properties (opacity, drying...), summed up in a user friendly chart on our website.