Ink mixing Instructions:

Pad printing Inks are mixed by weight not volume. *(A digital scale measuring in grams is recommended.)*

- Open the Ink Container and mix thoroughly.
- Place an appropriate container on the scale & zero out the TARE on the scale.
- Add 100% of ink *(or 100 grams)* into the container.
- Zero out the TARE on the scale
- **SKIP this step if you are not using any additives**
- Hardeners and/or promoters should be added at this time. Ratios are listed on the package. *(example 10% or 10 grams of MP200 hardener is added)*
- **MIX THOUROUGHLY FOR 2-3 MINUTES**
- Zero out the scale, add minimum 20% *(20 grams)* up to 30% *(30 grams)* of thinner. We recommend allowing the ink to pre-react for 15 minutes once mixed before printing begins.

Ink has a pot-life of 8-10 hours when hardeners have been added.
Ink has to be periodically re-thinned in the ink cup to replace evaporated solvents.
Typically a 2-3 hour maintenance program can be implemented on longer runs.
Never return ink back into the original container after dispensing.
All mix ratios are based off of the original 100% ink weight, do not accumulate.

If you still require assistance, please contact technical support @ 1 800 982 1928

Sigma Ink Corporation inks@sigmainks.com www.sigmainks.com Phone (888)223-5137

Ink and Additive Usage Guide:

	Single Component	MP 200 Hardener (10% by wt.)	MP 201 Glass Hardener (10% by wt.)	MP 202 Adhesion Promoter (10% by wt.)	MP 203 (5% by wt.) *Shortens pot life of the ink and life of the pad	Pretreat (Corona or Flame)	Low Temperature Bake (175˚F - 20 min)	High Temperature Bake (300˚F - 20 min)
ABS/SAN	•							
Acrylic Glass (PMMA)	•							
Anodized Aluminum		•		•				
Glass, Ceramics, and Chrome			•		•[1]		•	
Metals		•						
PETG, PETA	•							
POM (Delrin)		•				•		•
Polyamide (Nylon, Kevlar)		•						
Polycarbonate	•							
Polyester	•			•				
Polyethylene, Pre-treated	•			•		•		
Poplypropylene, Pre-treated	•					•		
Polyurethane		•						
Polystyrene	•							
Powder Coated Surfaces		•						
PVC, Rigid	•							
PVC, Flexable	•							
Phenolic			•		•[1]			
Textiles, Cotton	•							
Textiles, Synthetics	•							
Varnished Surfaces	•							
Paper, Corrugated Board	•							
Wood	•							

Legend & Notes:
• Recommended
1) MP 203 offers maximum durability but will shorten the pot life of the ink and life of the pad.
Catalysts: Ink hardeners and adhesion promoter must be mixed into the pre-measured ink supply before thinning.
Thinning: Adjust viscosity by using MP 102 Thinner to 15-30% by weight of ink depending on application.
Ink Speed: Speed of the ink can be further adjusted by using MP 103 Fast Thinner or MP 101 Retarder.

Multi-purpose pad printing ink specifically formulated with transferability, opacity, adhesion flexibility and high wear resistance

Semi-Glossy, Fast Drying, chemical resistant, One or two component system that utilizes 1 of 4 catalysts

Application

Substrates:
When used as a single component ink, the ink adheres extremely well to ABS, Acrylics, Polystyrene, Polycarbonate, SAN, PET, Rigid and flexible PVC, Polypropylene (pretreated), and varnished surfaces

When used as a two component system (with catalysts), the ink is excellent for Nylon, Polyurethane, Powder Coated and Anodized surfaces, Glass, pretreated Polypropylene, pretreated Polyethylene, and POM's such as Delrin with pre-treat and post bake.

Because substrates may be different in printability, preliminary trials are important to decide the suitability for intended use.

Areas of Use:
Sigma Multi-Purpose inks are currently being used in Automotive, Ad Specialty, Cosmetic packaging, Electronic component, Electrical appliance, Eye wear, Defense, Garment, Hand tool, Medical device, Sporting goods and Toy industries.

Ink Characteristics

Drying:
Touch dry time: 15-40 seconds at 70˚F (20˚C)
Heated air dry time: 3-5 seconds at 120˚F (45-55 ˚C)
Post-print bake time: 5-10 minutes

Pot Life:
The pot life (processing period) at room temperature (approx. 21°C/70 ° F) will be about 12-14 h with MP 200 or MP 204 and about 8-10 h with MP 201 or MP 203. Higher temperatures reduce pot life. If these times are exceeded, the ink's adhesion and resistance may be reduced even if the ink characteristics show no obvious change.
When the ink is used as a single component ink it has an indefinite working life

Fade Resistance:
Sigma uses quality pigments to provide lasting vivid colors of printing ink. Maximum resistance to fading and weathering is achieved when using opaque colors. Only applying a thin layer of ink (shallow plate) to your substrate will negatively affect the fade resistance of the print.

Wear Resistance:
After being allowed to fully cure to the substrate Sigma Multi-Purpose ink demonstrates excellent adhesion on a wide variety of substrates. Performance characteristics include resistance to alcohol, scratch, rub, and tape.

Some substrates such as glass or Delrin require the ink to be used as a two component ink with the addition of performance improving additives. Please consult the ink usage guide and test your particular substrate compatibility prior to production.

Color System

Opaque Colors

MP-510	Black EO
MP-311	Light Gray EO
MP-320	White EO
MP-330	Primrose Yellow EO
MP-331	Rich Yellow EO
MP-340	Orange EO
MP-350	Fire Red EO
MP-351	Red EO
MP-380	Reflex Blue EO
MP-381	Blue EO
MP-390	Green EO

Mixing Colors

MP-M-10	Mixing Black
MP-M-20	Mixing White
MP-M-30	Mixing Warm Yellow
MP-M-31	Mixing Yellow
MP-M-40	Mixing Orange
MP-M-50	Mixing Pink
MP-M-51	Mixing Red
MP-M-52	Mixing Scarlet Red
MP-M-70	Mixing Violet
MP-M-80	Mixing Blue
MP-M-90	Mixing Green

MP CLEAR Clear/Varnish

Metallic Colors

MP-300	Metallic Silver
MP-305	Rich Metallic Gold
MP-306	Bright Metallic Gold
MP-307	Pale Metallic Gold

CMYK

MP-P CYAN	Process Cyan
MP-P MAGENTA	Process Magenta
MP-P YELLOW	Process Yellow
MP-P BLACK	Process Black

Custom Color Matching

As a service, Sigma will custom match to Pantone, RAL, Federal Standard, or sample color chips.

Additives

Performance Improving Additives

MP-200	Hardener	10%
MP-201	Glass Hardener	10%
MP-202	Adhesion Promoter	10%
MP-203	Aggressive Hardener	5%
MP-204	Hardener	10%

Performance improving additives should be added to the ink concentrate as a percentage of the weight of the ink. These additives should be mixed into the ink before thinning. Post bake may be needed for the best results on particular substrates and should be tested and confirmed before production.

Thinners

MP-101	Retarder	3-10%
MP-102	Thinner	15-30%
MP-103	Fast Thinner	15-30%
MP-104	PVC Thinner	15-30%
MP-105	PET Thinner	15-30%

Thinner should be added to the ink concentrate as a percentage of the weight of ink measured out. Thinning requirements may require adjustment for particular process, speed or environmental conditions.

Printing Plates

All commercially available plate materials including: photopolymer, both thick- and thin-steel as well as ceramic coated metal are compatible with Sigma Multi-Purpose Series ink. Recommended artwork etch depth is 1.2 thousandths of an inch (0.0012 inch).

Printing Methods

Sigma Multi-Purpose ink is specifically formulated for the demands of the pad printing process; with transfer-ability, opacity, adhesion, flexibility, and high wear resistance being its core attributes.
Sigma MP Series has been extensively tested with closed-cup pad printing machines and has been used in screen printing and open ink well printing systems. Thinning requirements must be tailored to the specific printing process and environmental conditions.

Recommendations

Mix contents of the ink can thoroughly before each use. When using hardener and/or adhesion promoter, blend these additives with the measured amount of ink for at least 2 minutes before adding thinner (see additives section for mixing ratios). Ink is supplied in concentrated form (Thinner must be added for production use). MP-101 Retarder may be added to control ink tacking performance. All containers should be tightly sealed when not in use. Do not pour mixed or used ink back into the original container.

Shelf Life

Shelf life depends upon the formula/ reactivity of the ink system as well as the storage temperature. The shelf life for an unopened ink container if stored in a dark room at a temperature of 60-78°F is:

MP Ink – Metallic Colors	2.5 years
MP Ink – All Other Colors	3.5 years
MP Ink Additives	2 years
MP Ink Thinners	5 years

Under different storage conditions, especially higher storage temperatures, the shelf life is reduced. In such cases, the warranty given by Sigma expires

Labeling

Original ink and additive containers are labeled with appropriate health and safety information as well as downloadable MSDS. Sigma or its distributors can be contacted for any additional questions or concerns regarding labeling.

Certifications:

- Class VI Approved Medical Grade: USP Class VI Certified, In Vitro & In Vivo
- MIL Spec: A-A-208B Type I & II & Approved Federal Standard 595 Colors
- Phthalate Free: Annex XVII Items 51 & 52 of the REACH Regulation (EC) NO. 1907/2006 (formerly known as Directive 2005/84/EC)
- RoHS Compliant: Free of Lead, Cadmium, Mercury, Hex-Cr, PBB, PBDE-fire retardant
- REACH Compliant: Free of SVHC, as listed by ECHA
- EN-71-3: International Toy Safety standard regarding the use of toxic chemicals.
- CPSIA: Consumer Product Safety Improvement Act

Note

Any technical recommendations relayed through this TDS are based through our knowledge from our preliminary testing and qualifications of our inks. This information is merely to inform about our products and their uses. This is not meant as an assurance for certain properties of the products nor their suitability for each application. You are, for that reason, obliged to carry out your own tests with our products to prove they are suitable for the desired process. The selection and testing of the ink for specific application is exclusively your responsibility. Should 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.