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How to Use Functional Intrinsic Pigments (FI / FI-SK)

1. OVERVIEW

The Functional Intrinsic Pigment Systems (FI and FI-SK) are designed for use with medical-grade silicones to achieve natural, durable coloration in maxillofacial, ocular, and prosthetic devices. FI (Functional Intrinsic II Silicone Coloring System) is suspended in crosslinker, ideal for deep pigmentation and intrinsic coloration. FI-SK (Functional Intrinsic Skin Colors) provides pre-formulated skin tones for quick and repeatable blending during prosthetic fabrication.

2. MATERIALS REQUIRED

Component	Description	Recommended Product
Silicone Base	Medical-grade elastomer, typically mixed at 10:1 ratio	VST-50
Thixotropic Agent	Adjusts viscosity for mold handling	A-300-1 Thixo
Functional Pigments	FI or FI-SK line, shaken thoroughly before use	FI / FI-SK Pigments & Vortex Mixer
Separator	Prevents adhesion of silicone to mold	F-901
Solvents / Cleaners	For cleanup and pigment removal	A-840 or Ethyl Acetate (B-3808)

3. MOLD PREPARATION

1. Remove all wax or clay residue from the mold.
 2. Clean thoroughly with liquid detergent and boiling water.
 3. Dry the mold completely and smooth the surface with fine wet/dry sandpaper.
 4. Apply F-901 separator and allow to dry fully before adding silicone.
- Tip: A clean, smooth mold ensures better blending of intrinsic coloration and reduces surface irregularities.



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4. SILICONE PREPARATION

1. Weigh out base and catalyst at a 10:1 ratio (by weight).
2. Add 1–2 drops of A-300-1 Thixo per 10 g of silicone to create a paste-like consistency.
 - Improves handling and reduces trapped air.
 - Often eliminates the need for vacuum degassing.
3. Mix until homogeneous before adding pigments.

5. PIGMENT DISPERSION

1. Shake pigment bottles vigorously to ensure even pigment distribution.
 - For consistent results, use a Vortex Mixer — a compact, high-speed laboratory mixer ideal for pigment bottles, test tubes, and vials.
Recommended Model:
Type: Vortex Mixer
Power: AC 100–240V ~ 50/60Hz
Mixing Speed: 2800 rpm
Dimensions: 130 × 125 × 70 mm
 - The vortex mixer ensures uniform blending of pigments, minimizing streaking and color separation.
2. Begin by adding white pigment (FI-SK-01) to establish opacity — typically 5 drops per 10 g of silicone.
3. Use primary colors (red, yellow, blue) to mix to the desired base tone.
4. Record pigment ratios for repeatability.
5. For general work: 3 drops pigment per 10 g silicone is typical for FI pigments.
Tip: Always mix colors in small test batches first and cure swatches to confirm tone accuracy.

6. CREATING SWATCHES

Separate small 5 g samples of the base mix and add additional pigment for specific tone adjustments (e.g., cheek, temple, or nasal variations). Label and record swatch formulas for future duplication.

7. FILLING THE MOLD

1. Begin with the back of the mold, filling in layers behind the helix or deeper contours.
2. Continue layering, blending different pigmented silicones to mimic natural skin transitions.
3. Keep leading edges slightly more translucent for optical depth.



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4. Avoid trapping air; the thixotropic mix helps reduce bubbles.
5. Apply gentle packing pressure for a bubble-free fill.

8. CURING

Follow manufacturer's silicone curing instructions:

- 40 minutes at 100 °C
- 20 minutes at 120 °C

Allow to cool before demolding and inspect for smooth finish and color blending.

9. POST-CURE FINISHING

Clean edges and remove flash carefully. Additional extrinsic coloration may be applied using FI pigments mixed with ETF (I-301) or CCH Solvent (A-840) for surface blending. Seal and polish as desired.

10. SAFETY & HANDLING

- Wear gloves and protective eyewear when handling pigments or solvents.
- Ensure proper ventilation during mixing and curing.
- Avoid skin contact and inhalation of vapors.
- Refer to SDS documents for FI, FI-SK, and associated solvents.

11. KEY NOTES

- Record all pigment ratios and batch data for traceability.
- Maintain consistent cure temperature and timing for color accuracy.
- Store pigments in a cool, dry environment away from direct sunlight.

12. REFERENCES

Based on Factor II Technical Protocols and Materials Workshop.