



NAPIM 2026 Summer Course

SHEETFED COATINGS AND OVERPRINTS

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WHAT'S THE DIFFERENCE?

- AN OVERPRINT IS APPLIED IN A LITHO INK UNIT AND ESSENTIALLY A PIGMENTLESS INK WHILE A COATING IS MORE FLUID AND APPLIED OUTSIDE AN INK UNIT



COATING TYPES

SIZING – TYPICALLY USED TO TREAT THE SUBSTRATE TO MAKE IT PRINTABLE, NO INK INVOLVED, APPLIED OVER SUBSTRATE ONLY

PRIMER – APPLIED OVER INK AND SUBSTRATE PROVIDING A SURFACE CAPABLE OF ACCEPTING THINGS ON TOP OF IT

COATING – APPLIED OVER INK AND SUBSTRATE AND MEANT TO BE THE FINAL PROCESS DONE TO THE PRINTED PIECE

LITHO OVERPRINT (OPV) - UTILIZES LITHO OFFSET INK UNIT TO APPLY AN UNPIGMENTED FILM EITHER ACROSS THE ENTIRE SHEET OR IN SPECIFIC SPOTS WHEN USING A LITHO PRINTING PLATE.

SIZING



APPLIED TO SUBSTRATE ONLY

- FOR PAPER AND PAPERBOARD - REDUCES PENETRATION OF INK INTO PAPER FIBER
- FOR PLASTIC AND METAL – INCREASES THE SURFACE TENSION (DYNE LEVEL) TO ALLOW INK TO LAY SMOOTHLY ON TOP AND IMPROVE ADHESION
- APPLIED AT MANUFACTURER OR IN HOUSE

PRIMER



APPLIED OVER INK AND SUBSTRATE ALLOWING
ADDITIONAL MATERIALS TO BE APPLIED ON TOP

- ALLOWS FOR APPLICATION OF GLUE, FOIL STAMPING,
PRINTING OF VARIOUS TYPES OF INK
- OFFER LITTLE IN THE WAY OF PROTECTION, I.E. RUB
AND SCUFF RESISTANCE
- MOST OFTEN APPLIED WITH A ROLLER OR ANILOX
COATER

COATING



APPLIED OVER INK AND SUBSTRATE AND
INTENDED AS A LAST DOWN APPLICATION

- OFFERS EXCELLENT PROTECTION, I.E. RUB AND
SCUFF RESISTANCE
- MOST OFTEN APPLIED WITH A ROLLER, ANILOX,
GRAVURE OR SCREEN COATER

LITHO OVERPRINT VARNISH (OPV)



APPLIED VIA A LITHOGRAPHIC INK UNIT

- SIMILAR TO AN OFFSET INK BUT WITHOUT THE PIGMENT
- DRIES ALONG WITH THE INK PRINTED UNDER IT
- WITH THE USE OF A LITHO PLATE, CAN BE APPLIED IN SPECIFIC AREAS WITHOUT APPLYING TO THE ENTIRE SUBSTRATE
- CAN BE USED AS A PRIMER OR A LAST DOWN COATING

APPLICATION METHODS



ROLLER COATER – SMOOTH ROLLERS RELYING ON PRESSURE AND VISCOSITY TO APPLY A THIN LAYER OF COATING; INLINE OR OFFLINE APPLICATION

ANILOX COATER – APPLIES SIMILAR FILM WEIGHT AS ROLLER COATER BUT AT A MEASURED VOLUME AND SMOOTHER AND MORE CONSISTENT ACROSS THE SHEET

LITHO INK UNIT – APPLIES LITHO PRIMER OR LITHO OPV. CAN FLOOD OR SPOT APPLY.

APPLICATION METHODS



ADDITIONAL OPTIONS TYPICALLY NOT APPLIED INLINE BUT PART OF A SHEETFED PRINT CONSTRUCTION;

SCREEN COATER – APPLIES COATINGS ONLY. CAN FLOOD OR SPOT APPLY COATINGS. METHOD FOR APPLYING THICKEST LAYER IN A SPOT APPLICATION.

INKJET PRINthead – PRINthead APPLIES CONTINUOUS LAYER OF CLEAR LIQUID ONTO THE SHEET OR SPOT EMBELLISHMENT. CAN ONLY APPLY COATING.

CHEMISTRIES INVOLVED



OIL BASED – RESIN AND ALKYD DISSOLVED IN VEGETABLE OIL, VEGETABLE ESTERS AND PETROLEUM BASED OILS. CATALYZED WITH METAL DRIER(S)

SOLVENT BASED PENETRATION - SOLVENT IS ABSORBED INTO THE SUBSTRATE VIA CAPILLARY ACTION

OXIDATION POLYMERIZATION - DRYING OILS CONTAINING UNSATURATED DOUBLE BONDS CROSS LINK UPON EXPOSURE TO OXYGEN

ADVANTAGES/DISADVANTAGES

- EASE OF APPLICATION AND COMPATABILITY

- FAIRLY LOW COST COMPARATIVELY

- TAKES TIME TO DRY

CHEMISTRIES INVOLVED



WATER BASED(AQ) – RESINS AND EMULSIONS IN A WATER BASED MEDIUM

EMULSION COALESCENCE – EMULSION BREAKS TYPICALLY DUE TO PH CHANGE
AND COALESCES INTO A RESINOUS FILM

ADVANTAGES/DISADVANTAGES

LOW COST

HIGH FILM INTEGRITY AND RESISTANCE PROPERTIES

LOW GLOSS

MASK DRYING OF INK UNDERNEATH

CHEMISTRIES INVOLVED



ENERGY CURABLE (UV, LED, EB, H-UV) – ACRYLATE RESINS BLENDED WITH ACRYLATE MONOMERS, CATALYZED BY PHOTOINITIATOR

FREE RADICAL POLYMERIZATION – ACRYLATES ARE POLYMERIZED BY USE OF UV LIGHT TO EXCITE PHOTOINITIATORS TO MAKE FREE RADICALS WHICH BOND RESINS AND MONOMERS TOGETHER

ADVANTAGES/DISADVANTAGES

IMMEDIATELY DRY

HIGH GLOSS

COST

MIGRATORY AND COMPLIANCE CONCERNS



PURPOSES

REDUCE ABSORPTION – PAPER AND PAPERBOARD FIBERS ALONE CAN MAKE INK LOOK MOTTLED AND INCONSISTENT

INCREASE INTERCOAT ADHESION – DUE TO WAXES AND SLIP AGENTS IN THE EXTRUSION PROCESS AND IN INKS, SIZINGS AND PRIMERS MAY BE NECESSARY

IMPROVE RUB AND SCUFF RESISTANCE – TRANSPORTATION OF PRINTED MATTER CAN RUIN PRINT LOOK

SPECIALTY SURFACES – BARRIER COATING, WRITABLE PRIMER, DRY ERASE COATING, CHEMICAL RESISTANCE AND SPECIFIC SLIDE ANGLE

PURPOSES

MODIFY VISUAL EFFECT – CHANGE THE APPEARANCE THROUGH VARIOUS GLOSS LEVELS; TYPICALLY GLOSS, MATTE OR SATIN. STRIKE THRU OR DRIP OFF CAN PRESENT A VISUAL CONTRAST OR ADDITION OF TRANSPARENT PIGMENTS LIKE PEARLESCENT

MODIFY HAPTIC EFFECTS – CAN CHANGE THE WAY THE PRINTED MATERIAL FEELS TO THE TOUCH. SOME EXAMPLES ARE:

- SOFT TOUCH
- RETICULATED
- SANDY FEEL
- RUBBER FEEL
- RAISED OR BRAILLE EFFECT

THE USE OF BOTH AN OPV AND A COATING TO ACHIEVE A CONTRASTING LOOK

- CAN BE USED TO ACHIEVE A GLOSS/MATTE APPEARANCE.
- CAN BE USED TO ACHIEVE A SMOOTH/RETICULATED APPEARANCE.
- TYPICALLY, THE OPV AND COATING ARE A SPECIFIC COMBINATION TO ACHIEVE THE DESIRED EFFECT.

THE USE OF BOTH AN OPV AND A COATING TO ACHIEVE A CONTRASTING LOOK

- THE OPV MUST BE ABLE TO LITHO. BUT CAN BE CONVENTIONAL OIL BASED OR ENERGY CURABLE.
- THE COATING CAN BE WATER BASED OR ENERGY CURABLE FOR SMOOTH STRIKE THRU.
- THE COATING CAN ONLY BE ENERGY CURABLE FOR RETICULATION STRIKE THRU.

GLOSS/MATTE APPEARANCE IS CALLED
SMOOTH STRIKE THRU





A SMOOTH/RETICULATED CONTRAST IS CALLED

RETICULATION STRIKE THRU





THANK YOU !!!

