



# TECHNICAL C&A INFORMATION

## UV Off-line Coater Problem-Solving - Roller v1.1

### Problem-Solving Guide - UV Roller Coater

Problem	Cause	Solution
<b>Uneven Coat-Weight Across Sheet</b>	<ul style="list-style-type: none"> <li>- Metering-applicator roller setting not parallel</li> <li>- Applicator-impression roller setting not parallel</li> <li>- Build-up on metering or applicator rollers</li> <li>- Build-up on impression roller</li> <li>- Rubber roller condition not consistent in diameter</li> </ul>	<ul style="list-style-type: none"> <li>- Adjust metering-applicator roller setting</li> <li>- Adjust applicator-impression roller setting</li> <li>- Clean metering/applicator rollers</li> <li>- Clean impression roller, replace cleaning blade</li> <li>- Check/replace rubber roller if needed</li> </ul>
<b>Insufficient Coating Film Thickness</b>	<ul style="list-style-type: none"> <li>- Metering-applicator roller setting too tight</li> <li>- Applicator-impression roller setting too tight</li> <li>- Coating viscosity too low - absorption into stock</li> <li>- Conveyor speed too slow - absorption into stock</li> <li>- High-absorption/low hold-out stock</li> </ul>	<ul style="list-style-type: none"> <li>- Open metering-applicator roller setting</li> <li>- Open applicator-impression roller setting</li> <li>- Use higher viscosity coating product</li> <li>- Increase conveyor speed, reducing absorption</li> <li>- Use stock with low-absorption/high hold-out</li> </ul>
<b>Excessive Coating Film Thickness</b>	<ul style="list-style-type: none"> <li>- Metering-applicator roller setting too loose</li> <li>- Applicator-impression roller setting too loose</li> <li>- Coating viscosity too high - high feed rate</li> </ul>	<ul style="list-style-type: none"> <li>- Close metering-applicator roller setting</li> <li>- Close applicator-impression roller setting</li> <li>- Use lower viscosity coating product</li> </ul>
<b>Sheet Sticks to Applicator Roller</b>	<ul style="list-style-type: none"> <li>- Coating viscosity too high</li> <li>- Coating film thickness insufficient</li> <li>- Applicator-impression setting too tight</li> <li>- Stock basis-weight too low</li> <li>- Stock grain direction parallel to applicator roller</li> </ul>	<ul style="list-style-type: none"> <li>- Use lower viscosity coating product</li> <li>- Open metering-applicator roller setting</li> <li>- Open applicator-impression roller setting</li> <li>- Use heavier basis-weight stock</li> <li>- Feed stock with grain-direction perpendicular to applicator roller</li> </ul>
<b>Matte UV Coating - Matting Pigment Collects in Metering Nip</b>	<ul style="list-style-type: none"> <li>- Metering-applicator roller setting too tight; larger matting pigments cannot transfer through the metering nip and collect as only the base coating transfers. Matting pigments are "milled" into a concentrated paste in the metering nip.</li> </ul>	<ul style="list-style-type: none"> <li>- Open metering-applicator roller setting</li> </ul>
<b>Insufficient UV Coating Film Cure</b>	<ul style="list-style-type: none"> <li>- Curing System Failure</li> <li>- UV lamp has reached end-of-life</li> <li>- Reflectors damaged/contaminated</li> <li>- Reflectors improperly focused</li> <li>- Insufficient UV energy output</li> <li>- Improper UV output setting used</li> <li>- Conveyor speed too fast, insufficient UV exposure</li> <li>- High-absorption/low hold-out stock</li> <li>- UV coating cure response insufficient</li> </ul>	<ul style="list-style-type: none"> <li>- Check system for proper operation</li> <li>- Replace UV lamp, track operational hours</li> <li>- Inspect and clean reflectors, replace as needed</li> <li>- Adjust reflectors for proper focus of UV energy</li> <li>- Increase UV energy output if available</li> <li>- Test output using UV FastCheck Test Strips</li> <li>- Use 300 wpi output or "high" setting</li> <li>- Reduce conveyor speed to increase UV exposure</li> <li>- Use stock with low-absorption/high hold-out</li> <li>- Test UV coating film cure response by using UV Cure Test Kit available from CAC</li> </ul>

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## Problem-Solving Guide - UV Roller Coater - *continued*

Problem	Cause	Solution
<b>Excessive UV Coating Film Cure</b>	<ul style="list-style-type: none"> <li>- Excessive UV energy output</li> <li>- Conveyor speed too slow, excessive UV exposure</li> <li>- UV coating cure response excessive</li> </ul>	<ul style="list-style-type: none"> <li>- Decrease UV energy output if available</li> <li>- Test output using UV FastCheck Test Strips</li> <li>- Increase conveyor speed to decrease UV exposure</li> <li>- Test UV coating film cure response by using UV Cure Test Kit available from CAC</li> </ul>
<b>“Orange Peel” Surface Appearance</b>	<ul style="list-style-type: none"> <li>- Excessive coating application</li> <li>- Coating viscosity too high</li> <li>- Conveyor speed too fast, insufficient leveling time</li> <li>- Insufficient coating flow-out</li> <li>- Poor wetting over ink/toners</li> </ul>	<ul style="list-style-type: none"> <li>- Close metering-applicator roller setting</li> <li>- Use lower viscosity coating product</li> <li>- Reduce conveyor speed, increase leveling time</li> <li>- Mix coating thoroughly prior to use</li> <li>- Use infrared lamps to heat applied UV coating film to reduce viscosity and promote flow-out</li> <li>- Use low-wax inks</li> <li>- Apply wax-free primer coating prior to UV coating</li> </ul>
<b>“Cratering”, “Crawling”, “Pin-holing”</b>	<ul style="list-style-type: none"> <li>- Poor wetting over inks/toners</li> <li>- Excessive spray powder application</li> <li>- Coating not leveling uniformly</li> <li>- Synthetic stock surface energy is too low</li> </ul>	<ul style="list-style-type: none"> <li>- Use low-wax inks</li> <li>- Apply wax-free primer coating prior to UV coating</li> <li>- Reduce powder application, use uncoated</li> <li>- “Powder-crush” or “dust” sheets prior to use</li> <li>- Mix coating thoroughly prior to use</li> <li>- Consult stock manufacturer</li> </ul>
<b>Poor UV Coating Adhesion; Flaking/Scratching</b>	<ul style="list-style-type: none"> <li>- Waxes in inks/toners</li> <li>- Printing inks not dry</li> <li>- Use of ink-additives that inhibit drying</li> <li>- Trapped ink oils or solvents</li> <li>- Dampening solution entrapment in ink film</li> <li>- Metallic ink - leafing pigments</li> <li>- Toner-based digital prints</li> </ul>	<ul style="list-style-type: none"> <li>- Apply wax-free primer coating prior to UV coating</li> <li>- Allocate adequate drying time prior to UV coating</li> <li>- Avoid using anti-skin/stay-open sprays</li> <li>- Use high-solids, low-VOC inks</li> <li>- Use glycol-free fountain solution chemistry</li> <li>- Use non-leafing metallic ink pigments</li> <li>- Use infrared lamps to promote adhesion</li> </ul>
<b>Low Gloss</b>	<ul style="list-style-type: none"> <li>- Insufficient coating application/film thickness</li> <li>- Insufficient coating leveling/flow-out</li> <li>- High-absorption/low hold-out stock</li> <li>- “Gloss-back”; coating absorbs into beneath ink</li> <li>- Excessive spray powder on the sheets</li> <li>- Coating not properly cured</li> </ul>	<ul style="list-style-type: none"> <li>- Open metering-application roller setting</li> <li>- Use higher viscosity coating product</li> <li>- Use infrared lamps to heat applied UV coating film to reduce viscosity and promote flow-out</li> <li>- Use lower viscosity coating product</li> <li>- Acclimate coating to room temperature</li> <li>- Mix coating thoroughly prior to use</li> <li>- Use low-absorption/high hold-out stock</li> <li>- Allocate adequate drying time prior to UV coating</li> <li>- Utilize UCR(Under-Color Removal)</li> <li>- Improve drying capabilities for printing inks</li> <li>- Apply wax-free primer coating prior to UV coating</li> <li>- Reduce spray powder application</li> <li>- “Powder-crush” or “dust” sheets prior to use</li> <li>- Test UV coating film cure response by using UV Cure Test Kit available from CAC</li> </ul>

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## Problem-Solving Guide - UV Roller Coater - *continued*

Problem	Cause	Solution
<b>Poor Abrasion/Rub Resistance</b>	<ul style="list-style-type: none"> <li>- Wax in inks/toners</li> <li>- Wax in primer coating</li> <li>- Metallic ink - leafing pigments</li> <li>- Coating film thickness insufficient</li>   <li>- High-absorption/low hold-out stock</li> <li>- Insufficient UV coating film cure</li>   <li>- UV coating film lacks sufficient slip agent</li> </ul>	<ul style="list-style-type: none"> <li>- Use wax-free inks</li> <li>- Use wax-free primer coating</li> <li>- Use non-leafing metallic ink pigments</li> <li>- Open metering-applicator roller setting</li> <li>- Use higher viscosity coating product</li> <li>- Use low-absorption/high hold-out stock</li> <li>- Test UV coating film cure response by using UV Cure Test Kit available from CAC</li> <li>- Mix coating thoroughly prior to use</li> </ul>
<b>Slip - COF/AOS Measurements Low or High</b>	<ul style="list-style-type: none"> <li>- Insufficient UV coating film cure</li> <li>- Excessive UV coating film cure</li> <li>- Coat-weight/film thickness varies</li>   <li>- Printing inks not dry</li> <li>- High-absorption/low hold-out stock</li> <li>- UV coating film lacks sufficient slip agent</li> </ul>	<ul style="list-style-type: none"> <li>- See “Insufficient UV Coating Film Cure” on page 1</li> <li>- See “Excessive UV Coating Film Cure” on page 2</li> <li>- Mechanical settings are consistent/unchanged</li> <li>- Coating viscosity remains consistent</li> <li>- Operational settings are consistent/unchanged</li> <li>- Allocate adequate drying time prior to UV coating</li> <li>- Use low absorption/high hold-out stock</li> <li>- Mix coating thoroughly prior to use</li> <li>- Use constant coating agitation during use</li> <li>- Use a different coating product with suitable COF/AOS characteristics</li> </ul>
<b>Ink Color-Shft</b>	<ul style="list-style-type: none"> <li>- Ink contains fugitive, non-permanent pigments</li> </ul>	<ul style="list-style-type: none"> <li>- Use UV-coatable permanent/light-fast pigments</li> </ul>
<b>Poor UV Coating Film Flexibility, Cracking</b>	<ul style="list-style-type: none"> <li>- Excessive UV coating film cure</li> <li>- Excessive coating film thickness</li>   <li>- Stock has poor flexibility and cracks; fiber breaks and paper-coating detaches</li>   <li>- Poor Scoring</li> </ul>	<ul style="list-style-type: none"> <li>- See “Excessive UV Coating Film Cure” on page 2</li> <li>- Close metering-applicator roller setting</li> <li>- Use lower viscosity coating product</li> <li>- Climatize pressroom for temperature/RH</li> <li>- Acclimate stock prior to use</li> <li>- Reduce heat being introduced into substrate; reduce infrared energy output</li> <li>- Clean reflectors</li> <li>- Replace UV lamp; excessive IR generation</li> <li>- Check for proper dies/scoring rules for stock thickness</li> </ul>