

> Trouble-Shooting Guide for Image Optimization, Quality and Artifacts


Observation	How Evaluated	Possible Causes	Corrective Action
Contrast Too Low	Clinical Images	• Improperly set replenishment rates	• Use Chemical Sampling Service to evaluate and optimize processor performance
		• Improper Technique	• Maintain optimum background density
		• Non-Recommended Chemistry type	• Use chemistry approved for use with the product(s) being processed
Speed Too Low	Clinical Images	• Improperly set developer temperature	• Increase developer temperature within recommended range
		• Screen speed lower than optimum for system	• Choose Higher Speed screen
Contrast Too High	Clinical Images	• Temperature too high	• Reduce developer temperature, within recommended range, to optimize image
		• Ultra High Contrast Developer type in use	• Choose High Contrast Developer type
Residual Thiosulfate Too High	Hypo Estimator Kit	• Wash water flow inadequate	• Check water flow rate • Ensure supply valves are fully open and free of scale and debris • Change clogged filters • Clean traps and lines
		• Wash water too cold	• Install mixing valve. Set temperature no lower than 50°F
		• Wash water level low	• Ensure processor drain valve is closed, and/or water solenoid valve is working properly • Ensure main water supply valve is fully open • Ensure wash water flow rate is within manufacturer's specification
		• Developer exhausted	• Correct replenishment rates • Ensure pumps are working properly
		• Fixer exhausted	• Correct replenishment rates • Ensure pumps are working properly
		• Fixer over concentrated	• Ensure fixer is mixed to manufacturer's specifications • Adjust automixer to center of specific gravity limits for product in use
Imaged Artifacts	Visual-minus density artifacts emulsion is intact	• Dust, dirt and lint in darkroom	• Clean darkroom counters frequently • Paint false ceiling tiles to seal particles in place • Use HEPA filtration in supply ducts
		• Screens not properly cleaned	• Clean screens properly and at appropriate frequency as recommended by manufacturer
		• Film storage bin contaminated	• Clean and vacuum all film storage and handling areas on a routine basis

Observation	How Evaluated	Possible Causes	Corrective Action
Pick-Off	Visual-minus density artifacts. Use Grease Pencil to show emulsion missing	<ul style="list-style-type: none"> Breakdown of developer or fixer hardening 	<ul style="list-style-type: none"> Check and adjust developer and fixer mixing Check and adjust developer and fixer replenishment rates Ensure developer to fixer crossover is tight and uniform
		<ul style="list-style-type: none"> Dryer temperature too high 	<ul style="list-style-type: none"> Adjust dryer setting to lowest possible for dry films
		<ul style="list-style-type: none"> Dryer rollers contaminated 	<ul style="list-style-type: none"> Clean all dryer and wash-to-dry crossover rollers
Curl	Visual or Jams in Automatic Handling Equipment	<ul style="list-style-type: none"> Low humidity in film storage and/or handling areas 	<ul style="list-style-type: none"> Ensure a humidity level of at least 35% rH in all locations where film is handled and stored
		<ul style="list-style-type: none"> Daylight Equipment Humidifier malfunction 	<ul style="list-style-type: none"> Have service ensure humidifiers in daylight units are connected and working properly
Drying Patterns	Visual in Reflected Light	<ul style="list-style-type: none"> Dryer temperature too high 	<ul style="list-style-type: none"> Reduce dryer temperature until film is just dry exiting the processor
		<ul style="list-style-type: none"> Dryer is not operating according to manufacturer's specification 	<ul style="list-style-type: none"> Ensure proper dryer tubes are installed per equipment manufacturer's specification. Clean all Dryer Tubes Ensure all heating elements are operating properly
		<ul style="list-style-type: none"> Improper squeegee as film exits wash 	<ul style="list-style-type: none"> Check wash to dry crossover squeegee and wash rack exit roller nips. Must be tight and uniform
		<ul style="list-style-type: none"> Breakdown of developer or fixer hardening system 	<ul style="list-style-type: none"> Check and adjust developer and fixer mixing Check and adjust developer and fixer replenishment rates Ensure developer to fixer crossover is tight and uniform
	Plus Density in Transmitted light	<ul style="list-style-type: none"> Dryer temperature too high 	<ul style="list-style-type: none"> Reduce dryer temperature until film is just dry exiting the processor
Static	Soft dark spots, streaks or tree shaped patterns on film	<ul style="list-style-type: none"> Darkroom Humidity too low 	<ul style="list-style-type: none"> Install humidifier in darkroom Install antistatic mats in darkroom work areas
		<ul style="list-style-type: none"> Processor Feedtray not grounded 	<ul style="list-style-type: none"> Ground feedtray to building ground with grounding wire
		<ul style="list-style-type: none"> Screens not cleaned with antistatic screen cleaner 	<ul style="list-style-type: none"> Use screen cleaner with antistat at recommended frequency
Scratches	Linear +/- density lines in direction of film processing travel	<ul style="list-style-type: none"> Guides out of alignment in turnaround or crossover assembly 	<ul style="list-style-type: none"> Remove rack and/or crossover and inspect for alignment and damage
		<ul style="list-style-type: none"> Chemical buildup on crossover guide 	<ul style="list-style-type: none"> Clean crossovers and guides each day Ensure processor exhaust is within manufacturer's specification Shut down processor and vent lid overnight and on holidays and weekends
		<ul style="list-style-type: none"> Roller(s) not turning freely 	<ul style="list-style-type: none"> Inspect rack for freely rotating rollers Replace worn and swollen bearings and broken or corroded springs Adjust chain as recommended by manufacturer

Observation	How Evaluated	Possible Causes	Corrective Action
Water Spots	Reflected circular patterns on image. May show up transmitted if severe	• Wash rack exit nips not uniform	• Inspect and adjust spring tensions on exit rollers. Replace worn rollers, springs and bearings
		• Wash to dry crossover squeegee not tight and uniform	• Inspect crossovers. Replace worn rollers, springs and bearings
		• Processor not level	• Level processor using a sight level placed on the tank walls
		• Dryer Temperature too high	• Adjust drying temperature to lowest possible setting for dry films
Transport Problems/ Jamming	Curl	• Humidity Too Low	• Ensure humidity is in recommended range in storage and use areas
		• Improper Storage	• Store film at all times under the recommended conditions
		• Daylight handling equipment humidifier malfunction	• Ensure humidifiers in daylight equipment are installed and operating properly
		• Drying Temperature Too High	• Reduce dryer temperature to minimum setting to achieve dry films
Curtain Runback	Plus density drip line on trailing edge of processed film	• Poor Squeegee at exit of Developer Rack	• Check and adjust squeegee at developer rack exit
		• Poor crossover tension in some Processors	• Replace worn springs, rollers, bearings and assemblies
		• Poor Developer Hardening	• Use recommended chemistry types • Ensure chemistry is properly mixed and replenished
Algae/BioSlime	White to grey, blue or green chalky spots on surface of processed film	• Poor Rinse Water Conditioning	• Use Bromine tablets to condition wash water • Install particulate filter on incoming water supply • Ensure water hardness is within the recommended range of 40 to 150 ppm total hardness. Condition if necessary
		• Long periods of standby	• Drain wash tank when processor is shut down for the night/weekend • Increase flow rate of wash water if possible • Use auto-drain function on processor for standby if available
		• Non-Draining wash tank at shut down	• Drain wash tank when processor is shut down for the night/weekend • Use auto-drain function on processor for standby if available
Image Noise	Clinical or Phantom Images	• Improperly seasoned chemistry	• Use developer starter and set replenishment rate within the recommended range
		• Developer temperature too high	• Reduce developer temperature within recommended range
		• Screen speed too high	• Select lower speed screen
		• Developer type not optimum for application	• Evaluate lower noise developer options

Observation	How Evaluated	Possible Causes	Corrective Action
Wet Screen Artifact	Visual-Dark specs throughout the image area	• Improper screen cleaner	• Clean screens as recommended by manufacturer
		• Insufficient drying time after cleaning	• Stand screens open for at least 15 minutes to air dry after cleaning
Safelight Fog	High fog on phantom or clinical images MQSA Darkroom fog test	• Improper safelight	• Use safelight filter recommended by film manufacturer • Use proper wattage bulb • Install safelight at a proper distance from work surface and direct safelight up or away from work surface • Use the proper number of safelights for the darkroom size
		• Worn or damaged safelight bulbs or filters	• Replace bulbs at a routine interval • Replace filters at a routine interval or when cracks are noted
		• Darkroom light leaks	• Repair cracks around doors, processors, pipes, ventilation grids and ceiling tiles
Wet Films	Damp or sticking films exiting the processor Dryer jams	• Developer exhausted or improperly mixed	• Ensure developer is properly mixed and properly replenished
		• Fixer exhausted or improperly mixed	• Ensure fixer is properly mixed and properly replenished
		• Excessive developer carryover into fix tank	• Ensure developer to fix crossover and exit rollers are tight and uniform
		• Poor squeegee in wash tank exit rollers or wash to dry crossover	• Ensure wash to dry crossover and exit rollers are tight and uniform
		• Dryer malfunction	• Ensure dryer tubes are clean and blowers and heaters are functioning properly

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