Corporate Brochure

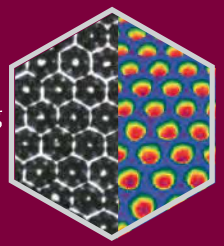
Global Anilox Technology Leader Since 1971

www.harperimage.com

HARPER® Anilox Technology Development

Harper is proud to continuously develop and implement the newest anilox technology to take manufacturing to a new echelon. Harper believes that product quality should be the primary consideration in choosing an anilox company. Your anilox should be selected not for the lack of problems, but rather to expand your printing options and improve your bottom line. Harper's leading manufacturing technology offers high-quality products and the resources to keep your company's operation profitable and productive.

HARDNESS - Harper's ceramic coating is operated within an 1100 to 1300 range. Ceramic hardness above 1300 vickers changes the mechanical property making the ceramic too hard and, consequently, brittle and susceptible to cracking under press operation pressures. By keeping the ceramic hardness coating within range, we provide the hardest ceramic possible ensuring longevity and durability. This provides cost savings from reduction in damage to anilox rolls and extended performance.



POROSITY - Maintaining a minimal amount of porosity is as important as maintaining the correct hardness. Our porosity average of ½ percent allows us to maintain consistency during the engraving process and keeps a uniform volume across the face of the roll. Cost savings from more efficient ink transfer and less plugging.

SUPERFINISH - As part of our superfinish SOP, every anilox surface is measured using a non-contact surface finish instrument to record the RA (Roughness Average). The lower the RA, the lower the amount of roughness of an anilox. Every anilox we manufacture has an RA of 3.0 or less before being engraved. This low RA finish cannot be obtained without the low porosity, allowing us to provide the smoothest surface in the industry and most engraving consistency. Cost savings comes from more consistent engravings that allow for more consistent print quality.

TEST BURNS - Every anilox uses 3DQC measurement verification prior to engraving. Test burns are engraved at 1/8″ from the deadband. The volume and cell profile are verified prior to engraving the entire roll. Cost savings from repeatable engravings allow Harper to offer high-quality and consistent anilox rolls.

SMOOTHNESS - Harper has developed and incorporated the use of an internal proprietary software to work with the 3DQC. This gives us a quantifiable measurement of a cell wall in the form of a percentage. This tool allows Harper to maintain a consistently smooth surface after engraving. Cost savings are gemerated as rolls perform with less wear and scoring and provide extended performance.

Cladded Anilox Sleeve Technology

Details (you cannot see) that enhance dimensional stability

1. A closed cell material used in the expansion layer provides years of service without destabilizing.
2. Only resin saturated non-woven materials, instead of urethanes, are used in the filler layer.
3. The best available adhesive is distributed evenly between the filler and cladding to provide a bond for the life of the sleeve.
4. The cladding thickness is chosen for each sleeve design to allow for ultimate performance and can potentially prolong the life of the sleeve.

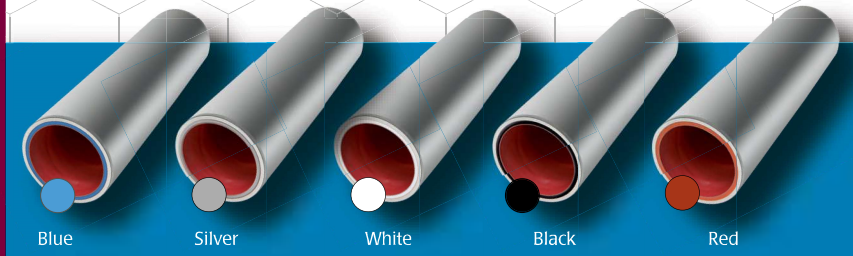
Cladless Anilox Sleeve Technology

Harper's exclusive Patent Pending Cladless Sleeve

- No aluminum cladding
- Lower cost and less turnaround time
- Lighter weight
- Corrosion resistant
- Great for odd engravings occasionally needed
- No reconditioning (single use)

Color Code Your Sleeve Inventory

Customize your inventory with different color RTV sleeves. Please ask us for details.




HARPER®
Advanced Anilox & Coating Roll Division

HARPER®
Advanced Anilox & Coating Roll Division

XLT™

XTREME LASER TECHNOLOGY

XLT™ – revolutionary innovations in cell profile technology with superior surface characteristics and enhanced cell cavities. XLT™ engravings deliver such high levels of quality and predictability, it comes with an exclusive print performance guarantee.

Print Quality

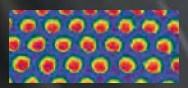
Harper has taken great pride in ensuring every customer experiences 'print quality' improvements as a result of delivering excellence in its products and services. Experience greater peace of mind with the best warranty in the industry that is 100% Print Performance Guarantee!

ULTIMATE QUALITY & PRECISION MEASURING

ECHOTOPOGRAPHY™ DIGITAL VOLUME

Our Echotopography™ (Interferometric) Digital Volume measurement system uses digitally calibrated measurements for setting up each roller to be engraved. This digital microscopic method is conducted using a series of reflective light waves on a sub-micron level, capturing cross sections of the engravings composing a 3D image of the cell resulting in a true volumetric measurement and a direct correlation to print density.


white light image


interferometry image

Experience Optimal Results

To achieve best results, the recommended anilox cell pattern for anilox rolls is the XLT™ 60 hexagon engravings.

NOTE - Other engravings are also available. Please consult your Harper GraphicSolutions representative for best recommendations for your application. You may also check the HARPER ANILOX CROSS REFERENCE GUIDE.

- Xtreme Low Porosity
- Xtreme Smooth Polish
- Xtreme Tight Tolerances
- Xtreme High Quality

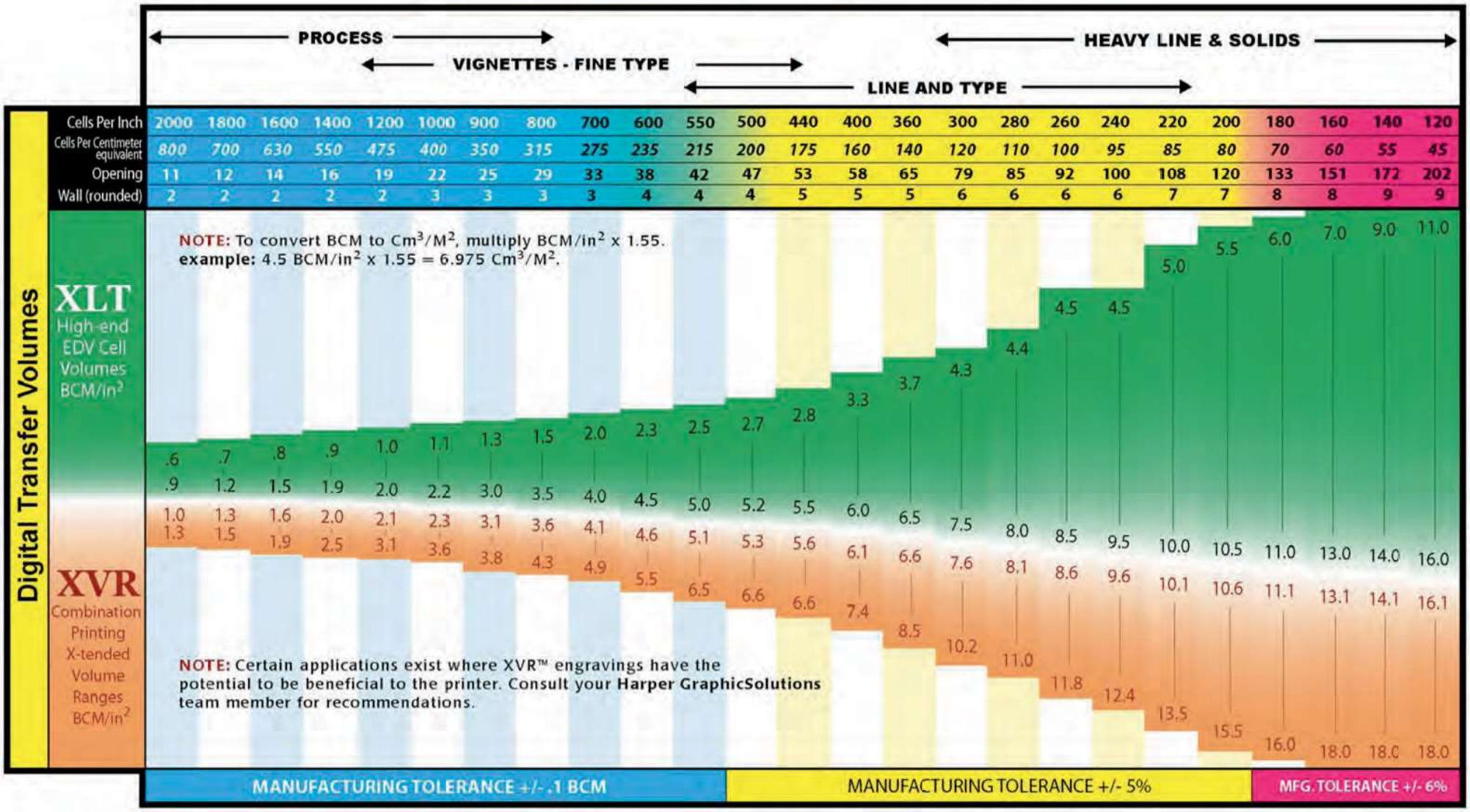
NOTE: Please ask us about our Harper Express and Stock Program

XLT™ - XVR™ Anilox Rolls

Echotopography™ Digital Volume (EDV)

IMPERIAL VOLUME CHART

ANILOX AND COATING ROLLS DIVISION



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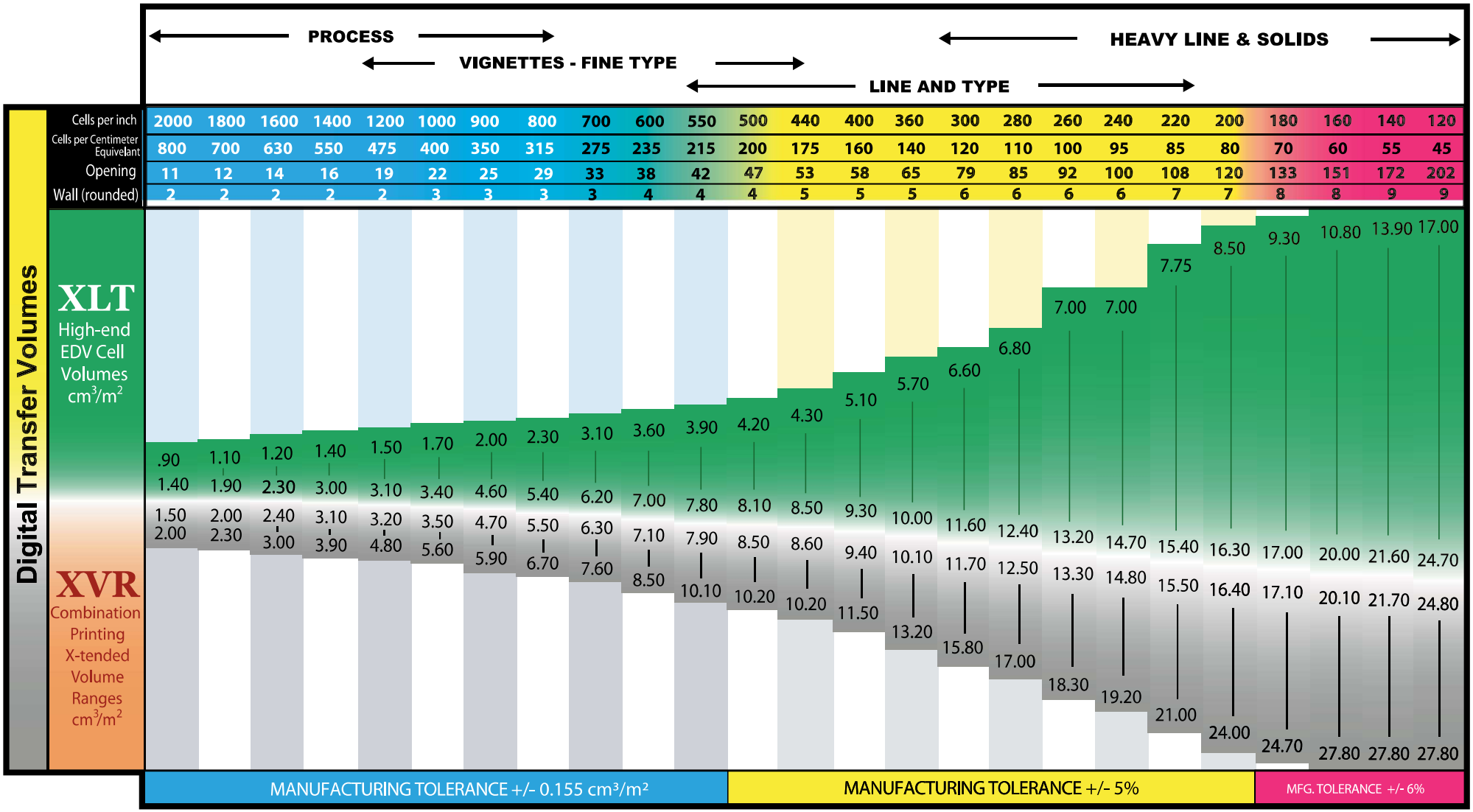
Learn more about Harper Corporation of America at www.harperimage.com

XLT™ - XVR™ Anilox Rolls

Echotopography™ Digital Volume (EDV)

METRIC VOLUME CHART

ANILOX AND COATING ROLLS DIVISION



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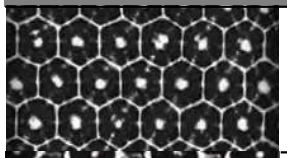
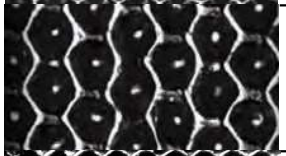
Harper Anilox Cross Reference

HIVE Family of Engravings

PRODUCT SHEET

ANILOX AND COATING ROLLS DIVISION

Engravings/Geometry	Application	CPI Range – Cells per Inch	BCM Range - Volume
 **60° Hex** XLT™ XVR™	Proven to be the highest performing engraving for line, combination, and process printing, including Expanded Gamut. XLT™ Esko HD Flexo (1600-900 CPI) XVR™ (Xtended Volume Ranges) Deeper XLT Volumes	XLT™ 2000 - 120 CPI XLT™ HD 1600 - 120 CPI XVR™ 2000 - 120 CPI	XLT™ 0.6 - 16.0 BCM XLT™ HD 1.5 - 3.0 BCM XVR™ 1.0 - 18.0 BCM
 30° Hex Channel Engraving & Super Channel	By removing a small part of the top & bottom cell walls, we have created a channel that moves heavy inks & coatings in a smooth line. Great for Opaque Whites, UV Inks, and Decorative Technologies. May also help reduce spitting with UV inks.	2000 to 120 CPI	0.6 to 16.0 BCM
 70° Hex Specialty Engraving	The 70° Hex geometry is slightly elongated in the linear direction compared to the 60° Hex. In preliminary testing, we have seen it may be beneficial for heavy coating applications with viscous inks or coatings. It may also help reduce foaming.	2000 to 120 CPI	0.6 to 16.0 BCM
 45° Quad LaserKote ™ Coating Rolls	For Thick Ink Films that require heavy transfer such as Adhesives and Heavy Coatings. Great for Decorative Technologies.	100 to 40 CPI	17 to 68 BCM
 XTR™ TriHelical 45°, 60°, 89° LaserKote ™ Coating Rolls	This geometry works well when the ink or coating has a fast dry rate or is very viscous. Abrasive chemistries are also another application for this geometry. Also a very good geometry for paper-to-paper and paper-to-film lamination applications. Available in 45°, 60°, & 89°.	200 to 40 CPI	13 to 85 BCM
 77° KatRon™ Specialty Engraving	Extended hexagonal cell geometry that allows for greater volume for solid and line work. May also be used for combination and process printing; however Harper highly recommends the 60° HEX XLT™ for these applications.	1600 to 180 CPI	0.9 to 13.5 BCM
 XDI™ Specialty Gravure Engraving	With our proprietary processes, we can burn digital data, patterns, line/shapes, logos, graphics, and tonal dots of almost any conceivable shape into a ceramic roll, replacing chrome surfaces. Our ceramic surface allows for forward or reverse metering and up to 10 times the life over chrome. Great for Cold Seal Applications.	Patterns, Shapes, Logos, Graphics, and Tonal Dots	

NOTE: Please consult your Harper GraphicSolutions™ team member for best recommendation for your application. Need help specifying a LaserKote™ anilox roll? Contact us and we will send you our LaserKote™ worksheet. We will guarantee the coating weight delivery of your roll.

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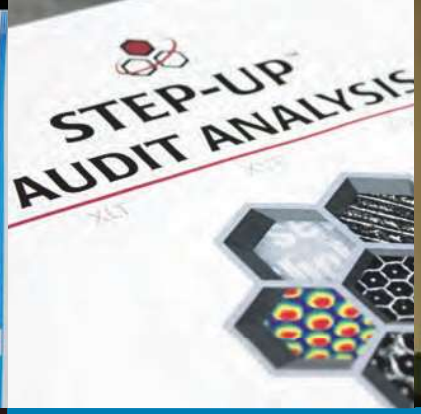
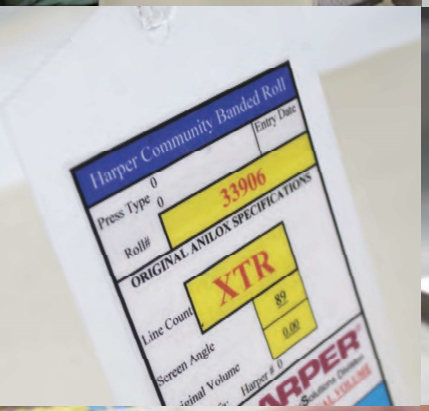
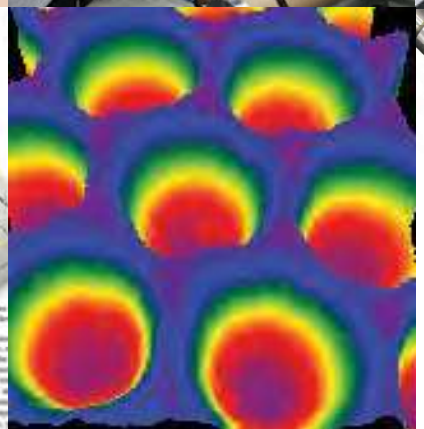




HARPER®
Harper GraphicSolutions Division



STOP SWATTING IN THE DARK!

HARPER®
Harper GraphicSolutions Division

TECHNICAL SERVICE SUPPORT TEAM

Our Harper team of trained experts will scientifically select anilox specifications to achieve YOUR SPECIFIC PRINT TARGETS based on the methodology of first (FTA-Flexographic Image Reproduction Specifications & Tolerances)

Harper Corporation of America is the only anilox company that has a dedicated technical service team comprised of industry professionals experienced in all facets of flexographic printing. Harper GraphicSolutions (HGS) represents a multi-disciplined team of experts, strategically positioned around the country, who assist flexographic printers in improving process efficiencies and profitability. The experience of our HGS team members includes Flexible Packaging, Labels, Folding Carton, Corrugated, Inks, Pre-Press, Plates, Print Management, Graphics, Production, Color Management, Scope Analysis, and Engineering. Each region in the United States is supported by an HGS Technical Graphics Advisor; however, they utilize the total team experience to help solve problems customer face in today's challenging print world.

The first and largest anilox support team in the flexo industry to become Level 3 First Implementation Specialists!

CERTIFIED first IMPLEMENTATION SPECIALIST

HGS TECHNICAL SERVICES:

Beyond consulting and strategic problem solving, HGS team members provide the tools, systems, and training to support our products and ensure converters achieve our guaranteed results. HGS offers many outstanding services such as:

- ANILOX ROLL MANAGEMENT
- EVALUATION PREVENTION
- ROLL VERIFICATION
- HAND PROOFER VERIFICATION
- CYLINDER MAINTENANCE PROGRAM
- ANILOX ROLL AUDITS
- BANDED ROLL TRIAL SUPPORT
- PRINT SAMPLE EVALUATIONS
- IN-HOUSE TRAINING SEMINARS
- ANILOX STANDARDIZATION
- GRAPHIC TEAM MEETINGS
- ANILOX TROUBLESHOOTING
- OPTIMIZATION
- FINGERPRINTING
- PROCESS CONTROL
- CHARACTERIZATION
- PROCESS IMPROVEMENT
- OTHER SERVICES AVAILABLE

HARPER®
Harper GraphicSolutions Division

STEP-UP ANILOX AUDIT

Systematic Technical Evaluation Process for Unlimited Potential

We know that getting an accurate view of your anilox inventory can help answer questions about your process and move your print quality in the right direction. That's why Harper created the STEP-UP Program, a systematic technical evaluation process giving you the information you need to achieve unlimited potential from your anilox inventory.

By combining the efficiency of a Harper Echochek strip with the digital accuracy of Harper's 3DQC Echotopography measurement system, the STEP-UP Program offers you a clear, accurate, and true reading of your anilox inventory.

The STEP-UP™ Program provides you with:
- A report containing microphotographs of your cell surfaces
- An excel spreadsheet detailing your current anilox inventory
- Recommendations on the condition of your anilox rolls

The objective of the *STEP-UP*™ report is to:
- Accurately determine anilox volume
- Evaluate the geometric cell quality of your engravings
- Compare the geometric cell quality to Harper quality standards
- Identify any irregular or physically damaged engravings
- Provide guidance for selecting replacement engravings

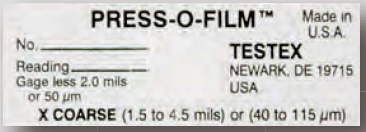
BENEFITS of the *STEP-UP*™ Program:

- **More accurate results.**
  Echocheks are quick and easy to use, and they provide accurate impressions of the anilox cells. By reading the Echochek results with our 3DQC echotopography system in the controlled environment of our Graphic Center, you get the most accurate anilox data possible.
- **Results with minimal down time.**
  With the STEP-UP Program, your press shutdown time remains confined to less than five minutes. So, you do not lose valuable production time when the Echocheks are taken.
- **Audit your complete inventory.**
  Whether an anilox roll is in your press or on the rack, we get an impression for you using the Echochek strip. (Or you can take the impression yourself.)

STEP-UP™ Combines the Efficiency of an Echochek™ Strip with the Digital Accuracy of the 3DQC Echotopography™ Measurement System.

WHAT IS AN ECHOCHEK?

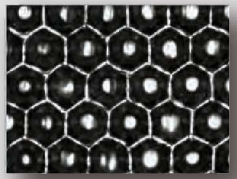
An Echochek is a small piece of malleable foil used to make an impression of an anilox roll engraving.



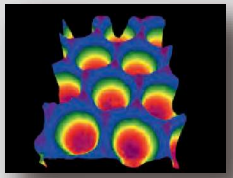
Echochek Strip

WHAT IS ECHOTOPOGRAPHY?

Echotopography is Harper's sophisticated anilox measurement system. The 3DQC scans microscopic objects producing both three - dimensional screen images as well as two - dimensional white light views.



3DQC Echotopography White Light Image



3DQC Echotopography 3D Image

HARPER®
Harper Echo-Xccessories Division

HEX
HARPER ECHO-XCCESSORIES

ADDITIONAL HEX PRODUCTS

Mechanical Engraved Cylinders

Our HEX division is able to fulfill the most stringent of cell requirements by leveraging a mechanical engraving tool library that is one of the largest in North America. Our specialists can design, manufacture, and mechanically engrave new cylinders to fit any machine, and recondition old cylinders to extend their lifespan. HEX delivers innovative chrome finishes to ensure their cylinders perform properly even in the most demanding of environments.

Rather than going through the expense of purchasing new cylinders – or even worse, scrapping an entire press – let the HEX experts breathe new life into your existing equipment. Retrofitting older presses with steel or carbon fiber cylinders that meet the print industry's rapidly changing technology is a must for printers who want to remain competitive while minimizing capital expenditures. HEX's exclusive process introduces components that help you stay up to date with the latest in flexographic press technology. These components meet industry standards and fit on existing presses. Their patented internally piped cylinders allow for faster sleeve mounting, while reducing the risk of cylinder failure, internal rusting, and metal flaking.

Print Cylinders

Carbon Fiber Mandrels

HEX's Carbon Fiber mandrels are specifically designed for flexographic printing presses. These Carbon Fiber mandrels are available with conventional air actuation or with HEX's patented internal piping. HEX Carbon Fiber base mandrels can be coupled with HEX s' carbon fiber bridge sleeves for a complete carbon fiber system.

- Lightweight, low inertia CF mandrels reduce press connected horsepower requirements to save energy.
- CF mandrels dampen press vibration for increased speeds and improved print quality.
- HEX high modulus filament wound CF mandrels are stiffer and allow for less deflection than conventional steel cylinders.
- Mandrels may be used as base mandrels to mount all HEX print sleeves.
- Patented internally piped CF mandrels allow for quick Print sleeve mounting and avoid pressure vessel rating requirements.

It is common for bridge sleeves to wear out over time. You can minimize the expense involved by having HEX repair and refurbish them. HEX will disassemble your bridge sleeve, assess the wear on the internal mechanical lockdown components, and replace the necessary worn parts. HEX will also refurbish external carbon fiber surfaces by grinding the outside diameter, removing imperfections that accumulate over time. We then use a cost-effective process to rebuild the outside diameter with nonwoven materials impregnated with a proprietary resin system. The result is a refurbished PCMC Carbon Fiber Mechanical Lockdown Bridge Sleeve that features a like-new surface, a guaranteed lockdown mechanism, and an outside diameter with total indicated run-out (TIR) that meets OEM specifications.

PCMC Carbon Fiber Mechanical Lockdown Bridge Sleeve

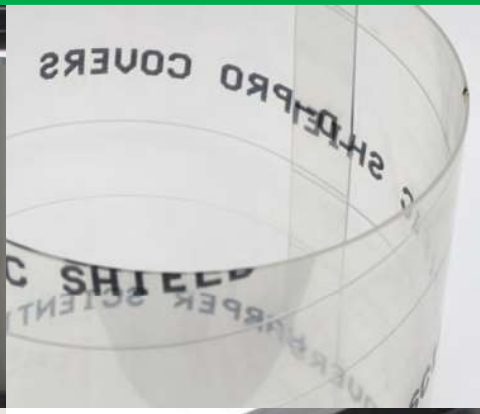


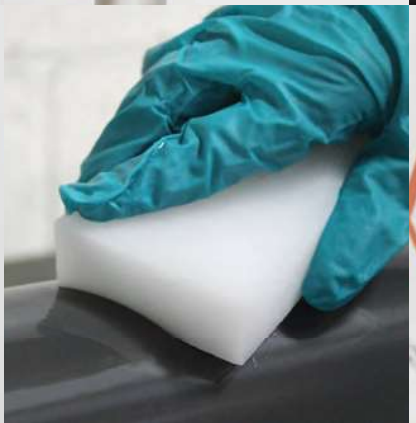



HARPER®

HarperScientific Printing & Coating Supplies Division



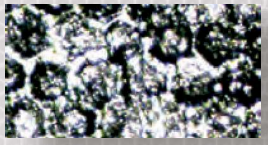




HARPER®
HarperScientific Printing & Coating Supplies Division

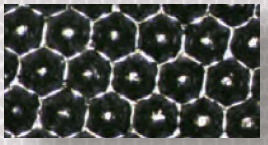
CeramClean II™

CeramClean II™ will effectively and efficiently remove dried ink from the engravings on your anilox without damaging the cell structure on ceramic and chrome cylinders. It will remove Water, UV and most Solvent-based inks.

Available in: 2 Packs (2-16 oz. bottles), 8 Packs (8-16 oz. bottles),1 gal. tub, 5 gal. containers and drums.



BEFORE



AFTER

Ceram Solv-It™

This cleaner is specifically for solvent-based inks, adhesives, and coatings. It is a real marvel for the solvent ink user that has a hard time getting all of the dried ink from the bottom of anilox cells.

- Liquid spray. It's incredibly quick, and easy to use on press.
- Contains unique, gentle corrosion inhibitors to prevent rusting.
- Environmentally friendly:contains no petroleum distillates and is biodegradable.
- It features a pleasant scent.
- It works fast so you don't have to spend much time cleaning.

Available in: 4 Packs (4-32 oz. bottles), 12 Packs (12-32 oz. bottles), 5 gal. tote, and 55 gal. drums.

Multi-Purpose Master Mix™

Use it to clean water-based inks on: Anilox Rolls, Rubber Rolls, Printing Plates, Ink Pumps, Ink Pans, Inks Hoses, Doctor Blade Chambers, Press Frames, and Press Room Floors.

TECH TIP - Cleaning an anilox roll while the ink is wet will minimize or eliminate the need for potentially damaging off-press cleaning systems

Available in 2 oz. packet boxes of 11, 22 or 44 pack, 5 gal.container, and 55 gal. drum.

HarperScientifc Product Line Available For Purchase at www.harperimage.com

HARPER®
HarperScientific Printing & Coating Supplies Division

AltraWash Green™ & AltraWash Blue™

Both are concentrated cleaners specifically designed & formulated to be safe & effective in Pressure Washing Systems, Soak Tanks, Ultrasonic Tanks, and/or as an “on press” anilox roll cleaner. Most importantly, both are cleaning formulas that are non-corrosive to aluminum.

Containing no petroleum distallates or environmentally hazardous chemicals; their advanced surfactant technology is exceedingly friendly to the environment.

They are biodegradable, low vapor pressure, low V.O.C cleaners with a pH level of 11.8.

Available in: 1 Gal., 5 Gal., 30 Gal., 55 Gal., and 275 Gallon containers.

ALTRAWASH BLUE™ — *For Cleaning Solvent & UV Inks*

ALTRAWASH GREEN™ — *For Cleaning Water Based Inks*

Recommended Mixing Ratio for Cleaning Applications	
Ultrasonic Tanks	**3to1**
Pressure Washing Systems	**4to1**
Soak Tanks	**4to1**
Press Side Cleaning	**5to1**
Ink System Flushing	**10to1**

UV Re-Leez™

UV Re-Leez™ is a cleaner specifically formulated for cleaning UV inks on narrow web presses, anilox rolls, and general cleaning. The cleaner’s advanced surfactant technology is exceedingly environmentally friendly, using no petroleum distallates or environmentally hazardous chemicals. It is a biodegradable, low vapor pressure, and low V.O.C cleaner.

- It can be diluted 10 parts water to 1 part UV Re-Leez for light cleaning, 5 to 1 for everyday cleaning, and full strength for heavy cleaning.
- Safe and effective for Ultrasonic Tank use. A one-week soak test found that UV Re-Leez is non-corrosive for aluminum.

Available in: 4 Packs (4-32 oz. bottles), 12 Packs (12-32 oz. bottles), 5 Gal. Tote, and 55 Gal. drums.

HARPER®
HarperScientific Printing & Coating Supplies Division

Performance Wash™

The Harper Performance Wash™ is a fast-acting, low-foam, highly alkaline-based anilox roll cleaner. It is suitable for use in removing Water-based, UV and Solvent inks. The Harper Performance Wash™ is engineered to clean through multiple layers of ink to the bottom of the cells.

It can be used in Automatic roll cleaning machines and Ultrasonic machines with rinse cycles. The unique formula requires less heat than conventional products and is active at room temperature. If heating the cleaner is desired, we recommend operating at or below 100ºF.

TECHNICAL SPECIFICATIONS:

The Harper Performance Wash™ is concentrated and can be diluted with tap water. Dilution recommendations are as follows:

Automatic roll cleaning units. . . . . Mix 1 part Harper Performance Cleaner with 1 part water.
Ultrasonic tanks. . . . . Mix 1 part Harper Performance Cleaner with 20 parts water.

NOTE - Dilutions can be varied depending upon type of ink and the condition of the roll.

Available in: 1 Gal., 5 Gal., 30 Gal., 55 Gal., and 275 Gallon containers

Anilox Surface Cleaner™

This specially formulated cleaner is ready-to-use and is designed to remove surface stains and residue blemishes from the surface of ceramic anilox rolls. The proprietary emulsifier helps to break down and loosen surface stains including water and ink marks, surface line blemishes, and coating residue. It is especially effective on coatings containing silicone. Anilox Surface Cleaner™ can also be used on press components and accessories. Great to use in combination with X-Cel™ pads.

Available in: 4 Packs (4-32 oz. bottles), 12 Packs (12-32 oz. bottles), 5 Gal.Tote, and 55 Gal.drums.

CROSS REFERENCE GUIDE

Aluminum Safe Ink Cleaners

PRODUCT SHEET

HARPERSCIENTIFIC DIVISION

	Specially Formulated to Remove:	It can also be used to remove:	Can it be used to clean Rubber Rolls?	Can it be used to clean Printing Plates?	Mixing Ratio for cleaning Printing Plates	Can it be diluted/ mixed with water for general cleaning?	Mixing Ratio for manual/hand anilox cleaning	Can it be used in Ultrasonic Tanks?	Mixing Ratio for Ultrasonic Tanks	Soak Tanks & Auto - Wash Systems Incl. Mixing Ratio
CERAM CLEAN II™ (BEST)	Water-based,UV, some solvent inks, coating and adhesives	Stains on ceramic rolls	Not Recommended	Not recommended	N/A	No	N/A	No	N/A	No
PERFORMANCE WASH	Water & Solvent Inks in Automatic Roller Cleaning Machines with Rinse Cycles	UV Inks	Yes	Yes By Hand or Wash Tank Best to test if cleaning cycle is longer than 30 min	1 to 1 with the tank heater off	Yes It's not recommended on painted surfaces	10 to 1 water to PW	Yes	10 to 1 water to PW run at less than 100F	1 to 1 with tank heater off
MULTI-PURPOSE MASTER MIX™	Standard Water-Based Inks	Ink System flush for corrugated. 2 oz for 5 gal of water	Yes, for natural or synthetic rubber	*Yes. Water-based must rinse thoroughly (Mounted)	2 oz to 1 quart of water	Yes	2 oz to 5 gal of water	No	N/A	Soak Tank Only, 2 oz per gal. Mix with hot water with heat
ALTRAWASH GREEN™	Higher pH Water-Based Inks	General press cleaning at 10 to 1	Yes. Must rinse thoroughly	*Yes. Water-based must rinse thoroughly (Unmounted)	7 to 1	Yes	(5 to10) to 1 depending on ink system	Yes, heat at 120F to 140F	4 to 1	Both at 3 to 1 at 120F-140F
RE-LEEZ™	Higher pH Water Water-Based Inks Caution: Use On Steel Bases Only	Heavy ink buildup cleaning 5 to 1	Not recommended	*Yes. Water-based must rinse thoroughly (Mounted)	10 to 1	Yes	4 to 1	Yes, heat at 120F	4 to 1	Soak Tank Only 4 to 1 with heat
CERAMCLEAN SOLV-IT™	Solvent inks, Adhesives & UV Coatings	Will work on some paste inks	EPDM Synthetic rubber rolls only	*Yes. Solvent Inks, must rinse thoroughly (Unmounted)	N/A	No	Use full strength	No	N/A	No
ALTRAWASH BLUE™	Solvent & UV Inks	General press cleaning at 5 to1	Not recommended	*Yes. Solvent & UV, must rinse thoroughly (Unmounted)	7 to 1	Yes	5 to 1	Yes, heat at 120F	3 to 1	Both at 4 to 1 water & 2 to 1 for UV & Solvent 120F - 140F
UV RE-LEEZ™	UV Inks	Cold seal water base adhesives	Not recommended	*Yes. Solvent & UV, Must rinse thoroughly (Unmounted)	7 to 1	Yes	5 to 1	Yes, without heat	4 to 1	Both at 3 to1 at Room Temp to 100F
ANILOX SURFACE CLEANER™	Solvent Silicone Coatings	Great ceramic stain remover used with X-Cel™ Pads	Not recommended	Not recommended	N/A	No	Use full strength	No	N/A	Not recommended

8.30.18

NOTE: - All of the above recommendations are for general use. It is best to always run a test before using a cleaner.
- Ratios listed are with water as the first number and chemical as the second number. In general, best safety practice is to add chemical to water, not water to the chemical.
* Because of all the different plate materials, it is best to not soak a plate with any chemical. Test on an old plate first.

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Anilox Roll Scrub Brushes

A good quality anilox roll scrub brush is perhaps the most cost-effective maintenance tool your press operator can have. With a good brush, cleaning is faster, and you won't waste time struggling to achieve color from a dirty roll. Each bristle is engineered at .003" diameter to be able to penetrate the bottom of the cells.

TECH TIP - Keep your anilox rolls clean and in good shape by cleaning after each use, scrubbing in a circular motion.

★ The Duro-Brush™ brushes are designed with tapered, extended life plastic handles that resist the impact of water and pressroom chemicals.

Printing Plate Brushes

Specially designed bristles developed to designed bristles designed to clean printing plates without the worry of damage. Mantains low water absorption and has excellent bristle recovery.

★ The Duro-Brush™ brushes are designed with tapered, extended life plastic handles that resist the impact of water and pressroom chemicals.

NOTE - Also available are the **Digi-Tek™** sponges, ideal for cleaning those delicate digital plates. Since the dot head is larger than the stem on digital plates, the dot is more easily damaged. This solvent-resistant sponge can be used in conjunction with almost any cleaner to clean delicate plates without snagging the dots.

Ultimate Lint-Free Rags™

Guaranteed lint-free and sold by the pound for your convenience. These rags are great for lint-free clean-up of plates, rubber rolls, anilox rolls, chamber systems, and pharmaceutical environments.

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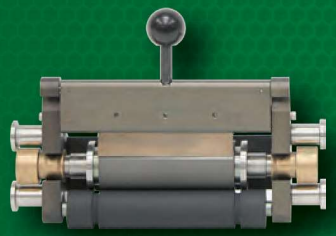
QD™ Ink Proofing & Printing Family

Multi-Process Flatbed Printing System

Available in standard 2.75" and Plus 5" print widths. It can simulate full coverage imaged Flexo, Direct Gravure, and Offset Gravure printing processes. The QD system consists of a manual or motorized proofer table configured to work with a number of different printing process heads.

QD™ Flexo

QD Flexo Proofers utilize a smooth transfer rubber roll for flood coating or a laser-imaged rubber roll. The rubber roll is imaged at 100 lpi and with a minimum line width of 85 microns. The QD Anilox rolls are available from 0.5 to 33 bcm at 1600 to 70 cpi.



QD™ Direct Gravure

Direct Gravure does not have a transfer roll, giving it higher deposition efficiency, but is limited to flexible substrates. For direct gravure, a rubber mat on the table supports the paper, film, or foil to be printed.

QD™ Flexo Plus

The QD Plus proofer and flatbed printer provides the widest drawdown available at 5". The Plus version is available with all of the combinations of process printing heads and tables. The QD Plus produces a consistent 4-3/4" x 20" proof. The Plus is perfect for the coating industry where a 4" x 4" print sample is the standard for checking coating deposits. The Plus can be provided with 0.5 to 33 BCM anilox rolls or XDI cylinders.

QD™ Offset Gravure

The Offset Gravure Handle uses a transfer rubber roll at the same diameter as the XDI gravure image so the print stays in registration.

ALSO AVAILABLE

- **XDI™ Image Proofer Anilox**
  The only laser-engraved imaged gravure proofer cylinders available with almost any digital design and down to 3 pt. text.

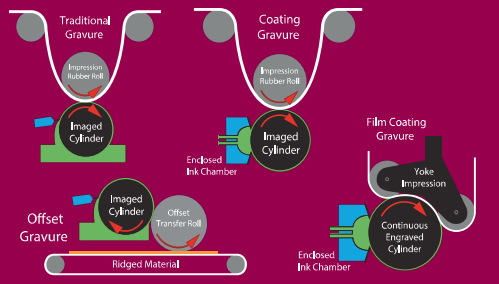
- **Imaged Transfer Rolls**
  Custom engraved with your logo or features such as tone scales, shaped patches, circuit patterns, and almost any image. Helps measure ink graphic and fuctional qualities. Quick and easy way to correct for varying dot gains of different substrates.

FLEXO PRINTING PROCESS

The Flexo printing process consists of an anilox roll (its volume controls the ink film thickness), a doctor blade (meters the anilox), and a relief image plate (transfers ink to the substrate).

GRAVURE PRINTING PROCESS

The QD simulates gravure coating and printing processes using a laser-engraved cylinder in the gravure head.



HarperScientifc Product Line Available For Purchase at www.harperimage.com

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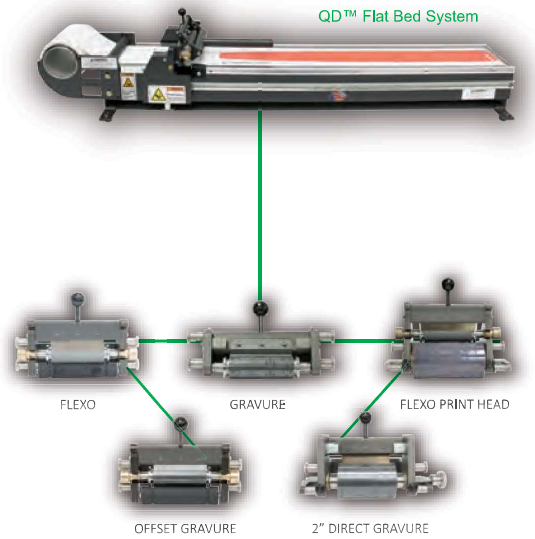
QD™ Ink Proofing & Flat Bed Printing System

The versatility of the QD™ components allow the proofers to be used by hand or in conjuction with the optional tables: Long or Short, Manual, Electric, or pneumatic-powered constant impression tables.

- Fully Portable.
- Glass Table Top.
- Low Maintenance.
- Solid Handle Without Springs.
- 2.75" & 5" Roller Widths Available.
- Front Loaded Anilox on Flexo & Offset Gravure.
- Substrates & Objects up to 1/8" thick with Flexo or Offset Gravure.
- Anilox Nip Loaded with Impression.
- Magnetically Loaded Doctor Blade.
- Constant Nip Pressure Through Stroke.
- Variable Speed Electric Model.
- Universal Electrical Power Supply.

Compatible with all QD™ Print Heads: Flexo, Direct, Gravure, Offset Gravure, and Flexo w/ Plate.



QD™ Printer Ink Proofing System

The QD™ Printer is the ideal Multi-Process printer for Flexible or Rigid Substrates, Testing color, images, coating coverage & functional inks

- Available models for the Standard 2.75" (70mm) or the Plus 5" (127mm) printer widths.
- Designed for lab safety in any ink environment.
- Modular construction with heavy duty components.
- Programmable travel speed with digital display and proof length display.
- Travel speed units can be set in inches,centimeters, feet, or meters per minute.
- Maximum speed of 1800 in/min (150 fpm) or 4570 cm/minute (45.7 mpm).
- Universal electrical power supply 85-265v, 65W & 50/60Hz.
- Table footprint 42" (107cm) x 14" (35.5cm); overall length including paper 48" (122cm).
- 12 to 33" (30.5 to 84 cm) stroke. 5 to 150 FPM or 150 to 4570 cm/minute.
- Cycle mode 1 to 10 round trips for dryer option.
- Drying options: hot air, adphos NIR or LED UV Phoseon (nm).

Compatible with all QD™ Print Heads: Flexo, Direct, Gravure, Offset Gravure, and Flexo w/ Plate.

HARPER®

Serving your printing needs from around the world!

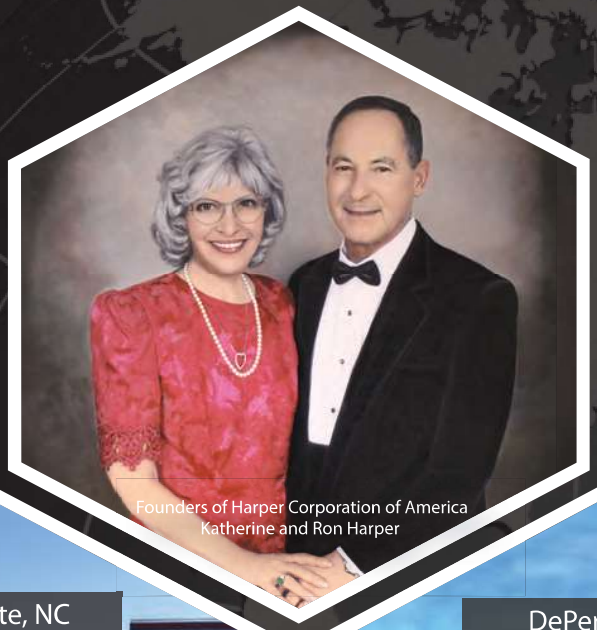
HARPER® is proud to be the pioneering company that was first to successfully introduce ceramic anilox surfaces for Flexographic printing. This changed the world of anilox engraving forever.

This leadership approach continued when Harper helped rocket Flexography's print quality to levels comparable to Offset and Gravure with the introduction of our Spectrum 60° Hexagon laser engraving geometry. The hexagon shape became and remains the global, standard anilox geometry for process, line and combination printing.

Harper revolutionized ceramic surface technologies through its foremost efforts in plasma ceramic technology. Harper was the first to achieve less than 1% porosity in its ceramic coating manufacturing process – thought impossible by experts before we did it!

Harper was first to adopt interferometric measurement for the anilox manufacturing process, resulting in the most consistent engravings and volumes industry wide. We also advanced surface transfer properties of ceramic when we introduced Platinum® surface technology.

Our commitment to excellence continues to pioneer surface technologies and engravings including: XLT™, XVR™, XDI™, XTR™, Laserkote™, and more.



Founders of Harper Corporation of America
Katherine and Ron Harper

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