



 FLEXO SYSTEMS



SYSTEM SOLUTIONS FOR FLEXOGRAPHIC PRINTING

**HIGHEST QUALITY –
REPEATABLE ON A GLOBAL SCALE**

FLEXOGRAPHIC PRINTING

THE INOMETA MODULAR SYSTEM FOR HIGHEST QUALITY FROM A SINGLE SOURCE

Proven competence, versatile know-how and extensive experience for all printing process requirements are equal parts of Inometa's flexographic printing master plan.

The advantages for our customers are:

- perfectly coordinated components and solutions
- process stability for a continuous production
- maximized performance by using high-tech materials
- original equipment quality (OEM supplier)

Through continuous improvement of our technologies, we ensure the consistent development of our products and their continuous adaptation to meet increasing demands. For you, the results are measurable benefits for an outstanding production.

Perfection in Flexographic Printing

The core competence of our business units Harper Graphics, Inometa AKL Flexo Systems and Inometa Rollers allows us to provide you with our flexographic printing product range. This modular system includes all rotating elements used in printing and converting machines – from anilox rollers and sleeves, pressure adapters, assembly sleeves to the OptiFLEX® program as well as winding cores and functional surfaces. The harmony of all these elements leads to optimum quality and productivity.

Our professional application expertise and our advice will allow you to take full advantage of our products while meeting the global market's demands towards the packaging industry.

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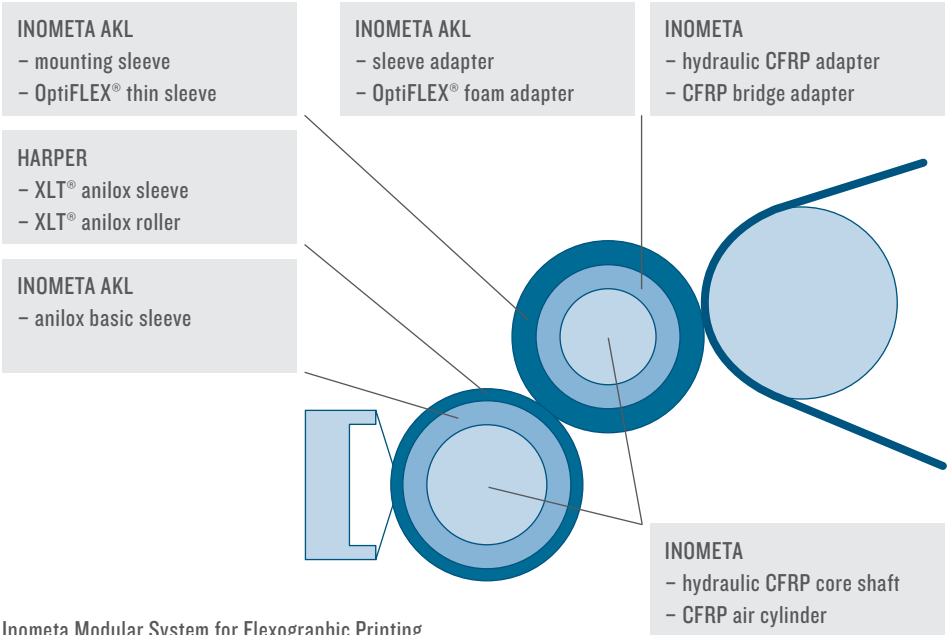


TAILOR-MADE SOLUTIONS FOR FUTURE CHALLENGES

FULL SPEED INSTEAD OF FULL STOP, MAXIMUM SERVICE LIFE INSTEAD OF WEAROUT

The printing industry is facing ever greater challenges when it comes to maintaining economic efficiency in high-quality printing processes. On one hand, the period between job changes are getting shorter due to small print jobs. Frequent machine retooling between jobs significantly reduces printing process productivity. Increased retooling work also means an increase in cost-intensive personnel expenses. In addition, excessive work load of the roller system through high speed, vibration, deflection due to poor material properties, inadequate design and improper surface finish leads to loss of quality, to waste, or even printing machine downtime.

On the other hand, the rapid and reliable recognition of brands and products has become a high priority in the global market. This means that the printed products of an international company must be produced in many countries with the same quality over a long period of time. This is a flexographic printing task that can only be shouldered with the right know-how and printing equipment with special technical features.



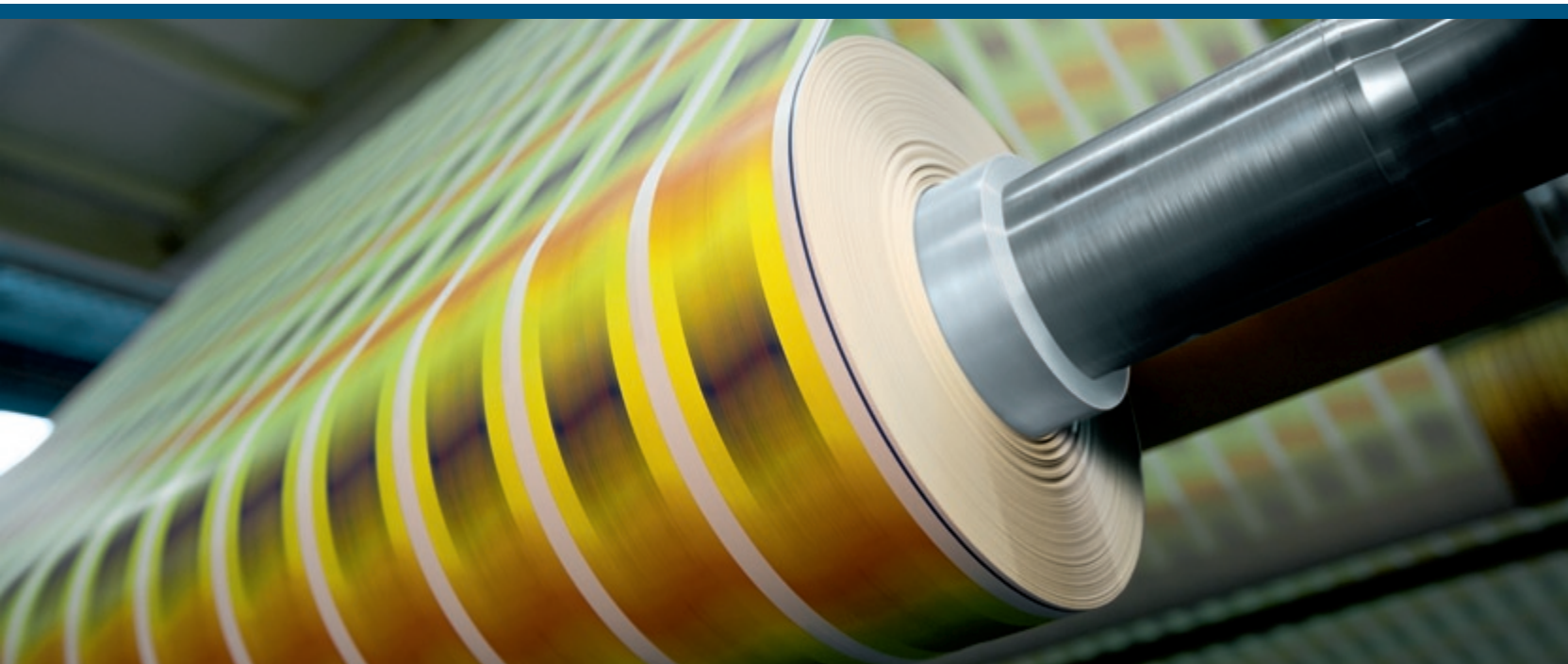
SOLUTIONS FOR TECHNOLOGICAL AND ECONOMICAL PROGRESS.

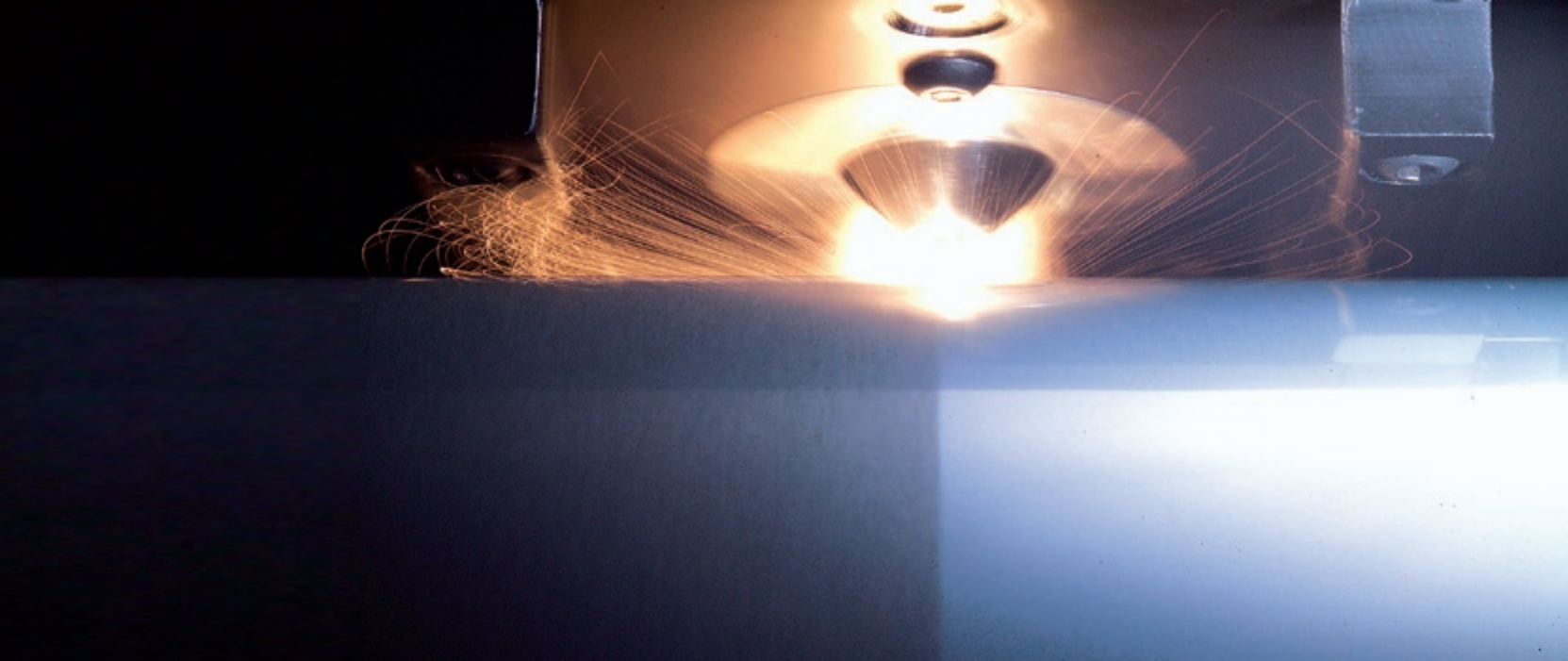
In its various specialized business units, Inometa has developed systems tailored to the highest degree to meet today's very diverse printing process requirements.

In partnership with machine manufacturers and cooperation with print shops, we fine-tune roller systems, adapters, sleeves and core shafts to build coherent solutions. With creativity and passion, we develop innovative systems that provide path-breaking flexographic printing possibilities. These possibilities are destined to achieve a maximum

of quality and performance, productivity and profitability for each application. This is how we make sure that our customers maintain their economical and technological edge.

We define flexographic printing standards. Because for us, precision is not only a claim, but a promise.





HARPER XTREME LASER TECHNOLOGY® (XLT)

BEST PRINTING RESULTS – REPEATABLE ON A GLOBAL SCALE

Harper Graphics, a business unit of Inometa as of 2004, uses its Xtreme Laser Technology® (XLT) to create a highly efficient cell structure in the ceramic surface. This makes Harper anilox rollers a unique solution for process print, combination print and solids print.

Harper XLT®

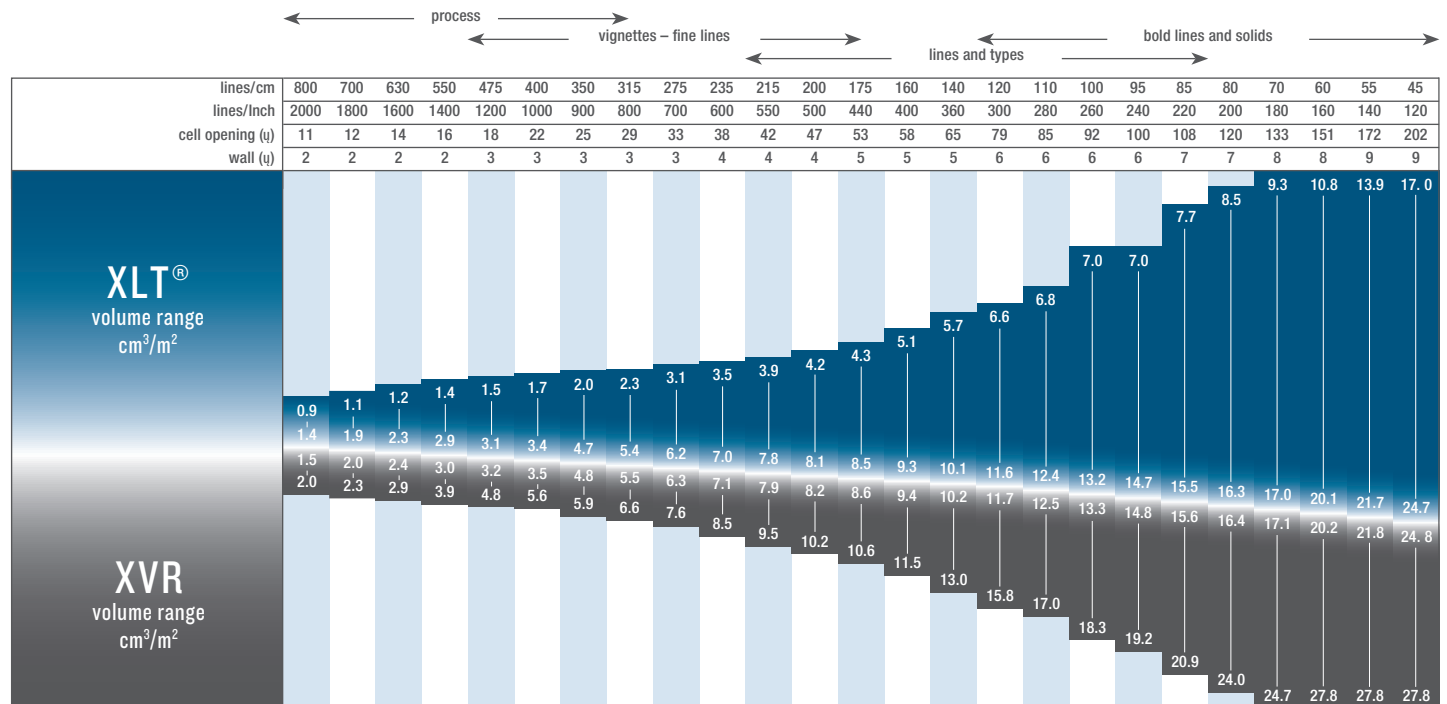
The Xtreme Laser Technology® introduces a structure in the ceramic surface of the anilox roller with which much more efficient and precise ink transfer results are achieved than known from the engraving techniques used so far.

In addition, the XLT® engraving creates a very evenly spaced cell geometry across the entire roller. This ensures a continuous ink release, even with high volumes and high line counts. Moreover, premature ink deposits are prevented, as can be seen again and again in the deeper parts of conventional cells. The cells' steep walls and flat bottoms ensure print results which are reliably repeatable, even over a longer period of time.

Long Service Life

Due to their shallow structures, ink residues can easily and gently be removed from Harper XLT® surfaces. Longer cleaning intervals, less ink consumption and a longer service life of the roller are the positive side-effects which in the long run make Harper's gravure one of the most productive surfaces

HARPER XLT® TECHNOLOGY VOLUME CHART



THE XLT® VOLUME RANGE

In this section of the volume chart, cells created with Harper Xtreme Laser Technology provide optimum ink transfer and excellent cleaning properties.

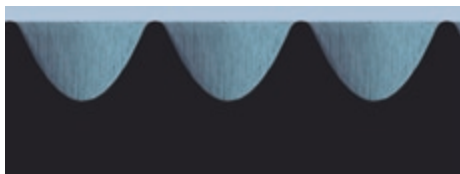
THE XVR VOLUME RANGE

The extended volume range (XVR) is needed for high quality printing processes with vignettes and very high color density in combination with fine-screen printing plates. As deep cells are more difficult to clean, efficient roll cleaning methods are a significant advantage. Our competent team of specialists will be happy to provide any advice or information you need.

THE XLT® CELL GEOMETRY

In the past, anilox surfaces were created using various manufacturing processes which could not satisfy all customer requirements. The cross-section shows that the XLT engraving creates a specific cell form which ensures outstanding printing quality and cleaning properties.

CO₂ process



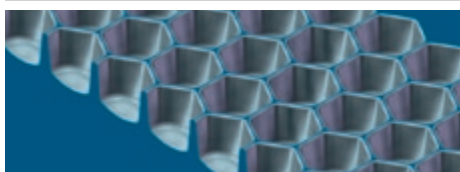
- parabolic cell shape
- low ink volume at limited screens counts

YAG process



- V-shaped cell shape = very deep bottom
- large cell volume with high screen counts
- limited ink release, difficult cleaning

Harper XLT® process

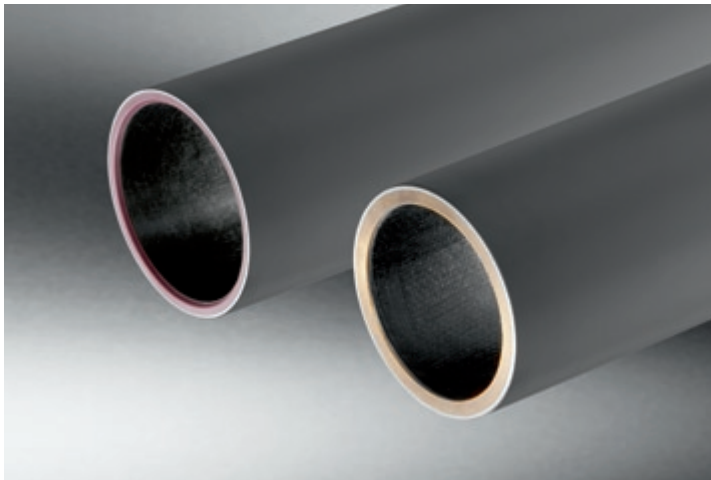
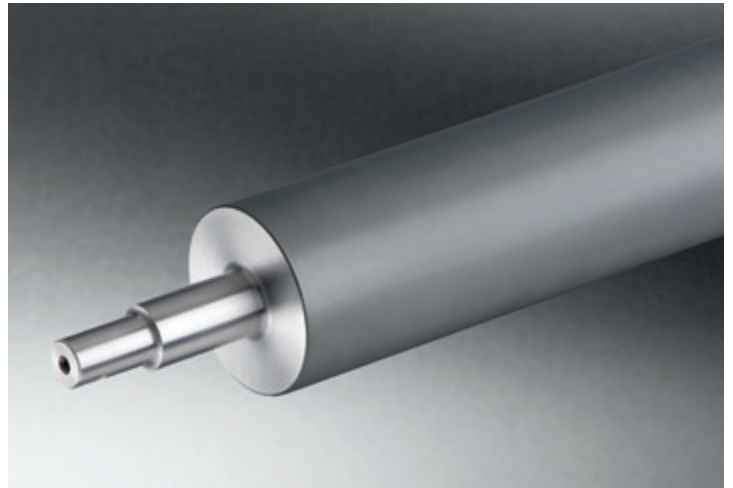


MEASURABLE QUALITY IS ONLY JUST THE BEGINNING. WITH HARPER, IT WILL BECOME PART OF YOUR DAILY BUSINESS.

HARPER XLT® ANILOX ROLLS

With the innovative XLT anilox technology Harper sets worldwide standards through the use of digital data transfer and production methods. This guarantees the consistency of the best quality again and again.

- new anilox rolls
- re-manufacturing of anilox rolls in accordance with the original specification
- high-quality ceramics with minimum porosity and excellent abrasion resistance
- tightest manufacturing tolerances worldwide



HARPER XLT® ANILOX SLEEVES

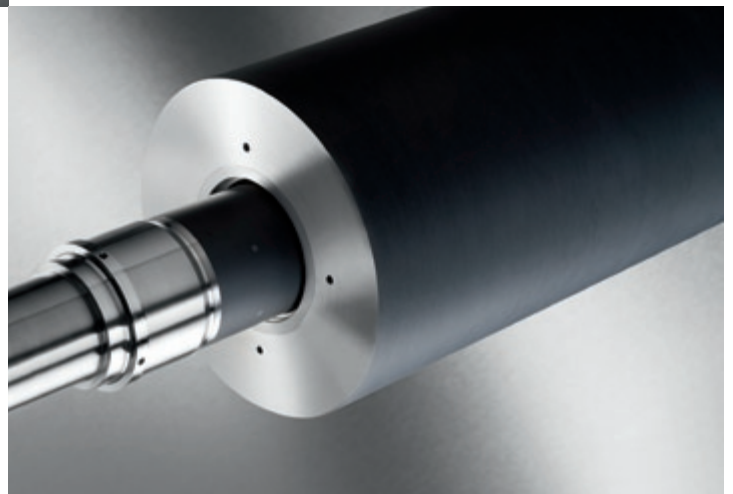
We supply anilox sleeves for all common flexo-printing presses and special applications. All criteria pertaining to the manufacturing of our anilox rolls also apply for sleeves.

- maximum accuracy in TIR
- weight reduction for wide web machines
- for CI-flexo printing presses and medium-width in-line presses
- designed for high-speed processes > 800 m/min
- production and re-manufacturing of anilox sleeves according to original specification

ADVANCED COMPOSITES/CFRP

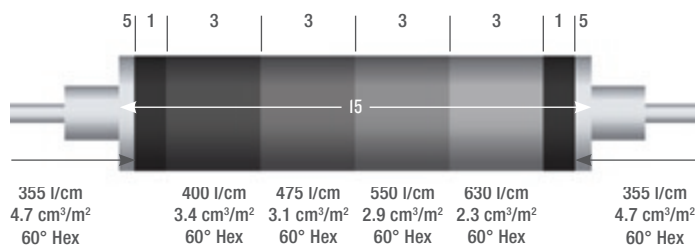
Harper is the only manufacturer of direct-coated anilox rolls/adaptor systems with carbon fibre bases. These are designed especially for fast-running printing processes, and for weight reduction.

- weight reduction at maximum stiffness
- excellent in dampening harmonics and vibrations
- easy handling through weight minimization
- precise printing results, also at high-speed processes

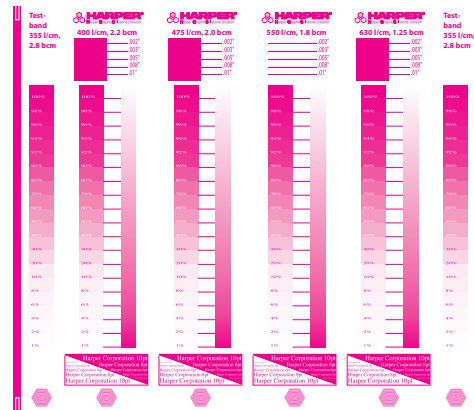


QUALITY ASSURANCE FOR COHERENT SOLUTIONS.

BAND ROLL TEST

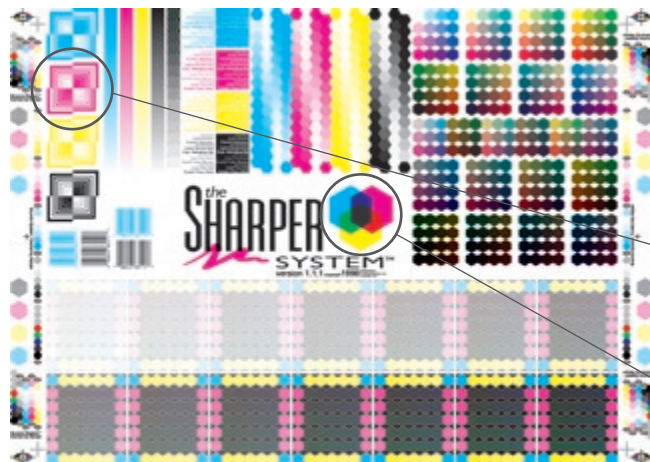


The banded roll test provides valuable insights: Different engraving specifications are used for a comparative test under completely identical conditions. The results of the banded roll test (shown on the right) are carefully analyzed to define the anilox specifications for optimum print results at the customer's facility.



The results of the banded roll test with original customer substrate.

FINGERPRINT



After selecting the correct anilox specification, the so-called fingerprint is defined as reference for all future printing processes. After evaluating and measuring critical elements such as color bars, rules, font sizes, register marks and bar codes it will allow the fine-tuning of pre-defined standards such as color density, dot gain, contrast, color trapping as well as grey balance. Possible deviations from the desired results can be optimised using the fingerprint in repro.



Reference for positive and reverse rules as well as their gain in both print directions.

Reference for the interaction of all colors with one another (color trapping).

CONTINUOUS QUALITY CONTROL



The control target on each repeat includes a reliable depiction of the print parameters. A statistic documentation will show deviations, even if they occur over a longer period of time.

The Harper Graphics Solutions team offers measurements, analysis and optimisations with reliable constancy. This means more than training sessions on

how to clean and handle Harper equipment, it also includes a holistic approach up to supplier coordination. If desired, Harper flexo print experts will set up all anilox roll in the facility to match the specified quality criteria and will be happy to inform our customer about additional ways to improve and optimize productivity in the printing process.



PRINTING CYLINDERS AND HYDRAULIC CORE SHAFTS WITH ADAPTERS MADE OF CFRP

THE PERFECT INTERACTION OF COMPONENTS AND COATINGS

Printing cylinders made of the high-performance CFRP composite material are the core of our comprehensive solutions for flexographic printing. In combination with a functional PROTEK coating, our products can ensure stable manufacturing processes.

The printing cylinder, the hydraulic core shaft and the adapter made of CFRP are a perfectly matched system for use in flexographic printing. These components ensure the strong performance and the high economic efficiency of printing processes. The components' low degree of deflection increases the quality of the print result, reduces waste and allows for maximum of production continuity. In addition, the use of these products reduces the labor-intensive retooling time between printing jobs of the machine and thus increases the profitability of the printing processes.

The CFRP printing cylinder can be equipped with CFRP adapters of various formats. The lightweight CFRP adapter makes for easy handling and significantly reduces set-up time. Having a clamping system which is operated both hydraulically and pneumatically makes the removal and mounting of the sleeve adapter as well as the transfer of compressed air to the pressure sleeve extremely easy.

The CFRP base core features excellent rigidity which ensures best print quality as high speeds. The stable hydraulic clamping minimizes the points of contact of core shaft and

adapters. With the usage of modern methods, we can facilitate customer-specific improvement of the CFRP laminates damping properties.

The features at a glance

- weight reduction of up to 80 %
- reduction of the moment of inertia by up to 80 %
- bending stiffness enhanced by up to 25 %
- doubling the critical speed
- adjustable damping system with up to twenty-fold higher damping factor than steel
- optimized printed image quality
- higher printing speed

FUNCTIONAL PROTEK COATINGS FOR STABLE MANUFACTURING PROCESSES

PROTEK coatings are the ideal enhancement for functioning mechanical equipment. Coordinated production processes make aluminium, steel, carbon fiber or glass fiber coating possible.

With web guiding systems for film or paper, you need to take care that air exhaustion and dimensional stability of the roller surface are permanently assured. Electrostatic charges need to be dissipated through the surface. In this case, Inometa recommends the use of PROTEK 7509.

After printing, ink deposits on guide rollers are not uncommon. PROTEK's non-stick coating reduces the amount of ink deposits which in turn considerably reduces cleaning time and costs.

Particularly precise web guiding is required near the edge trimmer to ensure a precisely cut edge and then best winding quality that can be achieved. Here we can recommend our cut-resistant PROTEK 8522 non-stick coating.

Tailor-made PROTEK surfaces are a permanent solution for functional rollers which are used for e. g. (corona) surface treatment.

The advantages at a glance:

- excellent web guiding properties
- reduction of cleaning/maintenance downtime
- increased production speed
- increased machine speed
- reduction of waste





PRINTING SLEEVES WITH ARAMID FIBER TECHNOLOGY

GUARANTOR FOR DIMENSIONAL STABILITY AND CONCENTRIC ACCURACY

Inometa printing sleeves can be combined with every pneumatic and hydraulic format adapter system. This is an investment which provides optimum productivity and has the advantage of swift return on investment.

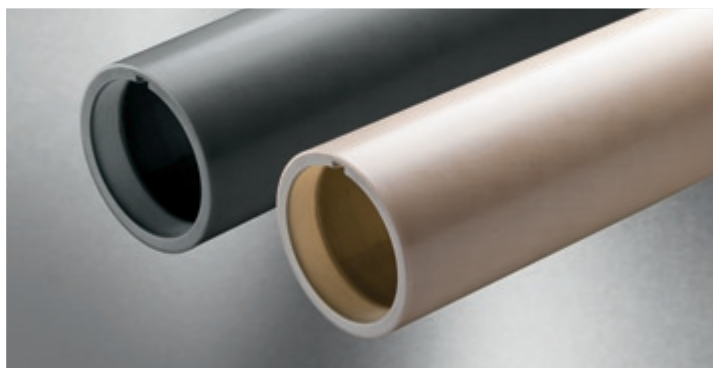
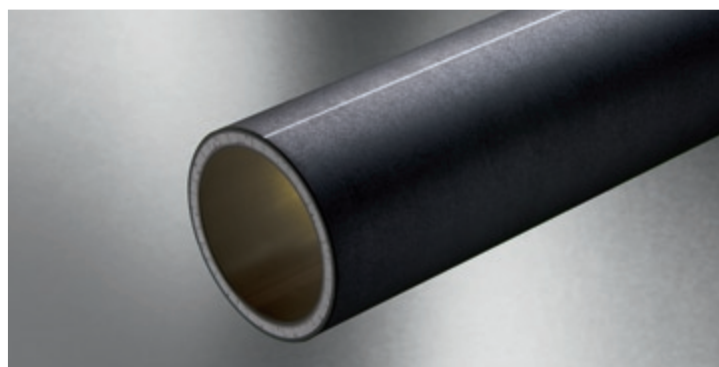
Inometa AKL Flexo Systems supply printing sleeves which offer the special 'memory effect' made possible through aramid fiber technology. These sleeves come with a basic core which has perfect clamping characteristics that do not change throughout the entire service life of the base. They are made of high-quality raw materials and are machined with precision grinding techniques. This ensures dimensional stability and a concentric accuracy with deviations of less than 20 µm. These features will remain the same throughout the service life, even with extreme

wall thicknesses and when subjected to temperature fluctuations and moisture effects. In addition, the printing sleeves are highly resistant to various solutions and cleaning agents used in print shops.

The dimensional stability ensures excellent, continuous register accuracy across the entire print width. The printing sleeve surfaces offer outstanding adhesion properties when using mounting tapes commonly available on the market. After use, the mounting tapes can be removed completely.

PRINTING SLEEVES WITH HARD SURFACE

In combination with high-quality foam adhesive tapes, hard surface printing sleeves provide repeatable printing jobs in top quality. Electrically conductive printing sleeves meet the ATEX 95 standard. The conductivity is less than 10^6 ohms.

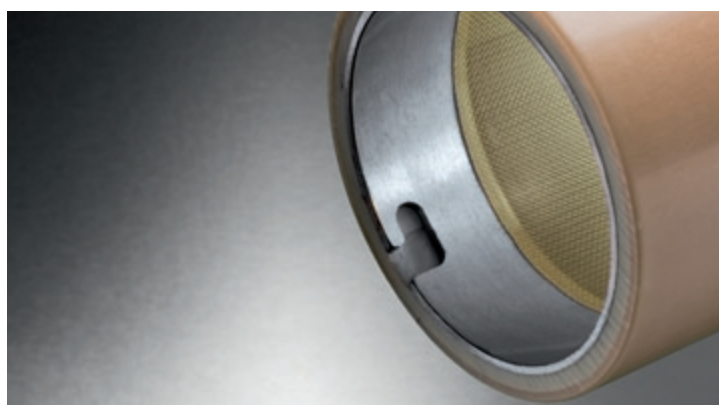


PRINTING SLEEVES WITH COMPRESSIBLE SURFACE

Printing sleeves with compressible surface make printing even more cost-efficient, as there is no need for foam adhesive tape. The continuous compressibility across the entire width is a feature which lasts the entire service life which constitutes considerable progress in the standardization of the printing process.

LABEL SLEEVES

Label sleeves bring a high degree of dimensional stability and accuracy to the label printing process. They allow for very high line counts in the print image and provide perfect register accuracy. Technologically and economically, they are the perfect choice for all label printing sleeve machines. In most cases, retrofitting cylinder machines with sleeves while maintaining print quality is easily done.



SLEEVE ADAPTERS

Sleeve adapters are an easily manageable, economically feasible feature of flexographic printing units. These adapters offer the highest degree of dimensional stability, even after years of operation. Synergies enable us to manufacture different structures and designs depending on requirements and applications. The product range includes traditional adapters that correspond with the design of the printing sleeves, as well as CFRP adapters of different strengths that complement this product range. The use of CFRP for vibration sensitive print designs reliably increases the overall stability of the printing system and thus dramatically improves the print quality. Electrically conductive pneumatic adapters meet the ATEX 95 standard.



OPTIFLEX® THIN SLEEVE SYSTEM

THE VANGUARD OF PROGRESS AND INNOVATION IN FLEXOGRAPHIC PRINTING

More and more colors and shorter print jobs are among the challenges in the package printing business. With modern printing machines come higher printing speeds and thus higher machine efficiency rates.

The OptiFLEX® thin sleeve system helps print shops achieve their goals by reducing set-up time and maximizing register accuracy. Vibration and detachments, as can occur in the use of printing plates, are very unlikely. The OptiFLEX® thin sleeve technology consists of an OptiFLEX® foam adapter and an OptiFLEX® thin sleeve. All system components can be perfectly matched with regard to substrate, color, anilox roller and machine.

Perfect Print Image

As part of the OptiFLEX® system, the foam adapter ensures a quick rebound elasticity and a uniform print image across the entire print width, such as would not be possible when using tape for plate mounting. Then there is the advantage of high economic efficiency through reduction of setup time when compared to conventional plate mounting.

Optimum Register Accuracy

The endless printing form with razor-thin base material ensures the highest register accuracy. The excellent printing pressure adjustment allows for low dot gain and perfect dot stability. In this way, the conditions are created to repeatedly print orders with high precision.

The OptiFLEX® system is made by Inometa AKL Flexo Systems as single source supplier. This is why adapter and print form are so perfectly matched.

OPTIFLEX® THINSLEEVE SYSTEM – THE PERFECT PRINT FORM

The OptiFLEX® thin sleeve can be supplied with various types of polymer. The delivery can be made either with print image or as a blank without print image. The polymer width is delivered to fit the print image. The standard OptiFLEX® thin sleeve system comes with a wall thickness of 1.573 mm.

OptiFLEX® Variable, OptiFLEX® plus and OptiFLEX® Tissue can be delivered as special versions for label printing, special print dimensions or special applications such as serviette printing. Flexosleeve digital is a tried and tested type of printing which combines all the advantages of continuous flexo polymer printing.



OptiFLEX® Foam Adapter and OptiFLEX® Thin Sleeve





OPTIFLEX® FOAM ADAPTER

THE ADAPTER FOR THE PERFECT PRINT IMAGE

The compressibility can be individually selected for a wide range of applications and machine types.

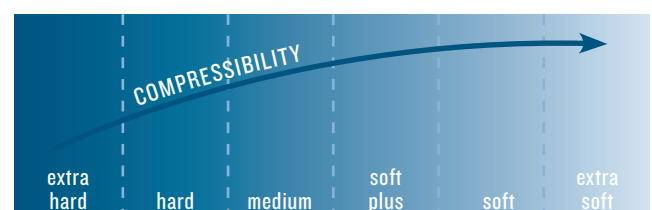
High Economic Efficiency

The OptiFLEX® foam adapter ensures a perfect print image. It combines highest compressibility with the extremely fast rebound elasticity of the integrated foam. For many years, these properties are retained across the entire surface of the adapter with an unparalleled uniformity.

The compressibility of the foam can be selected to match any application and/or machine type. One, or at the most two, compressibility levels should suffice for typical applications. For ease of use, the adapter is equipped with a metal ring and a bayonet, a register line and a stop ring for the optimal positioning of the OptiFLEX® print form.

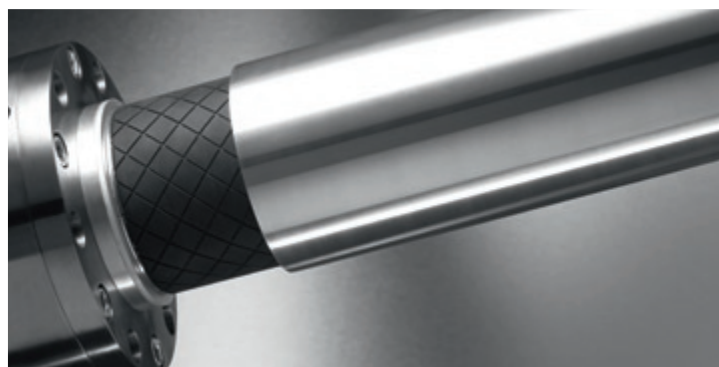
We take raw materials of very high quality for the adapter and put them together using premium standard production methods. In this way, we can produce adapters with a very high degree of stability and durability. This is for use in environments which are very humid as well as very warm, but also for applications where the adapter is subjected to tough conditions.

The OptiFLEX® foam adapter is available in different compressibility levels to meet various printing process requirements.



OPTIMIZED QUALITY AND EFFICIENCY WITH WINDING CORES

Today, WinCore® winding cores made by Inometa set worldwide standards for technologically demanding applications. Their high precision allows the efficient processing of wider web widths. Other outstanding features are the higher rotational speeds as well as the transport and the wrinkle-free and pressure-mark-free winding and unwinding of materials.



WINDING TUBES

Our WinCore® winding core systems made of aluminium, composites, steel or plastic are specially designed for various tissue, paper or cardboard qualities and can withstand high speeds. The winding cores are perfectly matched for the production of certain materials and for various finishing processes.

RFID WINDING CORES

With the RFID solution, we offer reusable winding cores made of metal with an integrated RFID chip, which provides major cost advantages throughout the entire value chain. The winding cores effectively support automated and integrated logistics processes. The material flow can be continuously followed in realtime.



QUALITY ASSURANCE ACCESSORIES



High-quality supplies, testing instruments and components for quality improvement, repeatability and productivity in flexographic printing complete the Harper product range.

THE PRODUCTS AT A GLANCE:

- anilox cleaning agents
- cleaning brushes
- protective covers for sleeves and anilox rolls
- hand proofers
- magnetic filters
- measuring microscopes



DID YOU KNOW?

FROM POTATO PRINT TO HIGH-END FLEXOGRAPHIC PRINTING

Flexographic printing has gone through several decades of development. Originally practiced under the name of aniline printing, this process was renamed in the United States in 1952.

The Relief Printing Method

Flexographic printing is a relative of letterpress printing, as it also occurs directly from a raised surface. However, there are three things that set it apart from letterpress printing. First, there is the different composition of the ink. Second, there is the use of elastic flexographic printing forms. And third, there is the use of modern methods, which make printing on different substrate possible.

From Aniline Printing to Flexographic Printing

At first, print forms made of rubber or elastic plastic were used for the printing method now known as flexographic printing. When transferring the print image to the material for printing, inks were used which dried through evaporation of solvents.

This method corresponds with the one which was initially called aniline printing in the United States and was always associated with the harmful tar derivatives which were included in the aniline ink.

Although proof was provided in 1949 that aniline printing inks contain no other pigments than other inks, the printing method could not shake the negative image it had until its name was changed to flexographic printing.

Today, flexographic printing is a popular direct rotary printing method which uses elastic, inked print forms to transfer liquid or highly viscous inks onto any type of substrate for printing.

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