

## HIGH SPEED ROTARY SCREEN LABEL PRINTING TECHNOLOGY

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Stork X-Cel has pioneered the development of rotary screen applications. This effort has produced technical advances applicable to many diverse industries where the advantages of rotary screen systems for printing and coating has been demonstrated and utilized.

The continuing evolution of rotary screen concepts and concurrent research now brings us a new frontier, i.e., the graphics industry. Tag and label printing represents an important end-use application for companies that can produce sophisticated and decorative labels from artwork geared toward a number of fast-growing consumer markets. Through a variety of print effects, these labels contribute to a product's salability and create broad consumer appeal. For our discussion, it would be useful to briefly review the basics of rotary screen technology before proceeding to a description of these new developments.

The rotary screen concept is simple to understand. Although the rotary screen forms the heart of the machine, the machine itself is more than just a carrier for the screen. The basic parts of the rotary screen printer includes not only the screen, but also the squeegee holder with the squeegee blade (which also functions

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as an ink distribution system), and the counter pressure roller.

The printing ink enters the screen through holes drilled into the squeegee pipe. After distributing the ink over the full width of the screen, the ink is centrifugally forced along the inside surface of the screen until it reaches the point of extrusion. The screen is rotating at the same speed as the substrate, which passes between the screen and the counter pressure roller. Therefore, this system is completely frictionless, which enables us to print onto a wide range of substrates, including paper and plastic film. The quality and quantity of ink laydown is determined by:

- the mesh number or fineness of the screen
- the angle and pressure of the squeegee blade, which is fully adjustable
- the point of extrusion; being at or above the center line of the counter pressure roller
- the viscosity of the ink, i.e., its rheological properties

The galvanic screens are unique and represent a key element in the ability to yield high fidelity print quality. These screens provide optimum ink coverage to obtain opaque bright color results. Stork has perfected the screen technique with the

development of its perforated rotary screens. The product range includes screens with different mesh numbers (number of holes per linear inch). They are made of almost pure nickel and are produced by a precision electro-forming process at mesh numbers of up to 305. The resulting nickel screens are flexible and durable. They are available in different thickness and degree of permeability (open area).

For high resolution label printing, the latest breakthrough is the introduction of Stork's Hi-mesh screen available in a range of repeat sizes ranging from 21.25 to 36 inches in 1/8" steps (or increments). This unique screen is an important contributing ingredient to the ultimate versatility of the Stork MRS printing system.

Stork's MRS 350 printing press with a maximum printing width of 350 mm is the most advanced rotary screen system available. In any comparison with conventional techniques, the MRS offers significant opportunity for savings because it provides lower production costs because of its high output, versatility and quick change-over times. The system is capable of continuous production of multi-color, in-register prints at speeds in excess of 100 meters/minute (325 feet/minute). It is ideally suited for the application of U.V. inks, which have become so important to

label converters. U.V. inks and lacquers yield high opacity prints. They also produce a raised effect, which has become an important design feature. This raised effect, which provides a "three-dimensional" label, can be enhanced using rotary screen. The impact of EPA regulations has focused our attention on the use of U.V. inks over solvent inks. Where the environmental factor is not an issue, the MRS press also offers improved opacity and ink coverage even with conventional solvent inks at speeds far in excess of what has been previously possible. This can be accomplished with no sacrifice to print resolution.

The Stork MRS press is designed to take advantage of the versatility of its modular design. Configurations can be engineered to comply with specific requirements. Roll to roll or continuous infeed and outfeed systems offer short run or long run adaptability. Complete printing systems can include, in addition to standard hot-air driers and U.V. curing stations, such diverse operations as rotary or flat die cutting and other finishing techniques. The universal print head allows for quick change-over times for a wide range of repeats. Rotary screen stations can be readily converted to gravure or flexo print units. Presses are also available which incorporate rotary, gravure or flexo formats in one single press.

In addition to completely automated register control systems for multi-color designs, the MRS press offers the opportunity of re-registering to previously printed multi-color prints.

The MRS printer provides many operational advantages such as:

- is a frictionless printing system
- allows for short change-over times
- yields precise ink deposits for reproducibility
- offers optimum ink coverage and excellent print definition
- can be combined with other print processes and finishing techniques

It is, therefore, an ideal system for the following end-uses:

- self-adhesive paper labels
- vinyl, polystyrene and polyester clear labels
- three dimensional decorative labels
- lottery tickets and scratch cards
- adhesive labels which require no die cutting