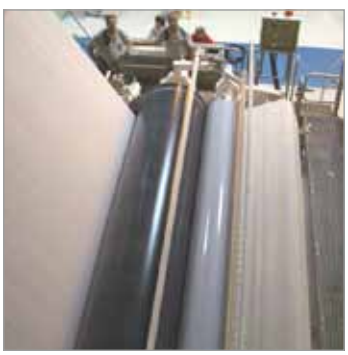
TWIN™ Sizer



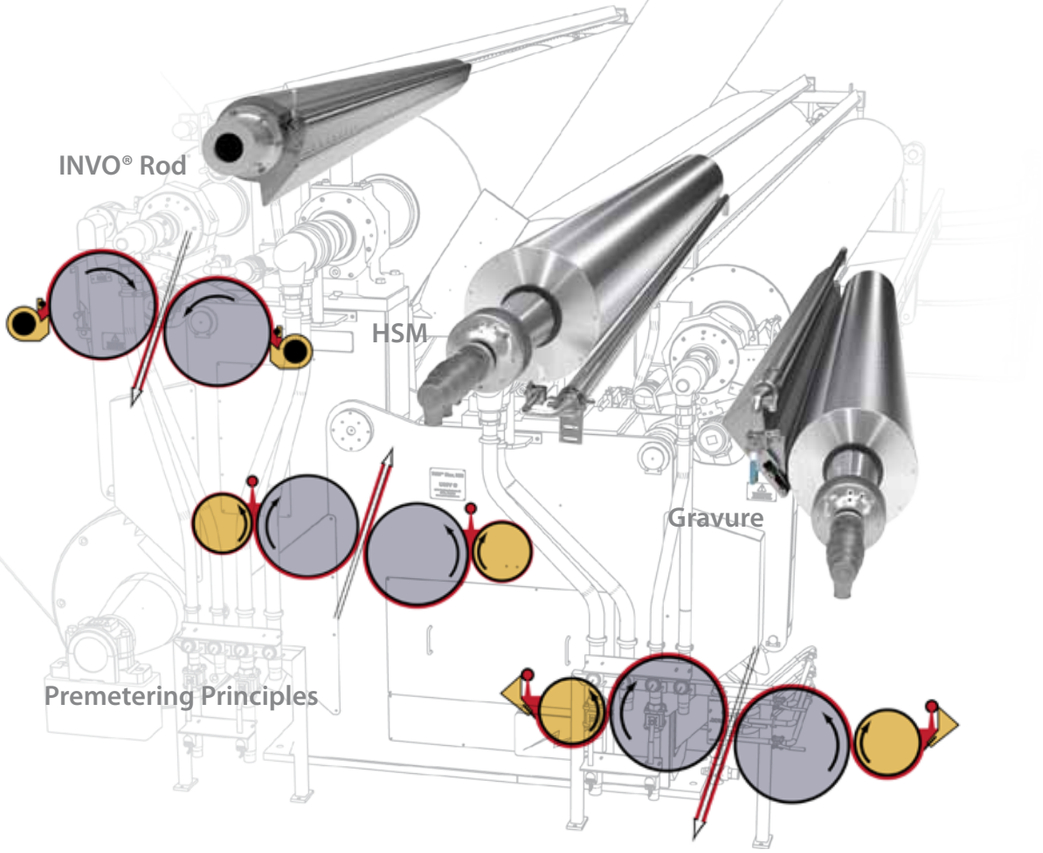
One TWIN™ Sizer for every need

UMV provides board and papermakers with the whole range of TWIN™ Sizer solutions, from sizing, pigmenting and coating applications.

UMV is a world-leading developer and supplier of innovative surface treatment technologies to the coated paper and board industry for new machine installations and rebuilds. More than 100 film transfer machines have been delivered.

UMV has a wide product portfolio and can offer all levels of film transfer machines, depending on the customer needs. Rod, HSM or Gravure metering element transfer a thin film on to the transfer roll of size, pigment or coating color onto both sides of the paper or board in the transfer nip. The choice of metering element method is depending on the base paper, end product quality, coating formulas and investment costs.

Developing and testing of all metering elements are possible to perform at our pilot coating facility in Säffle, Sweden. It is also possible to use the pilot facility for training of operating and maintenance personnel. Complete testing and check out in the workshop before shipment ensures easy installation on site and a fast start-up.



TWIN™ Sizer, Pond

for clean and compact design

The TWIN™ Sizer, Pond is designed to run maximum 800 m/ min and can be used for a wide range of base paper.

Benefits with the TWIN™ Sizer, Pond:

- **Proven and reliable technology**
- **TWIN™ Sizer, Pond is designed to provide a clean and compact solution**
- **Operator friendly and low maintenance cost**

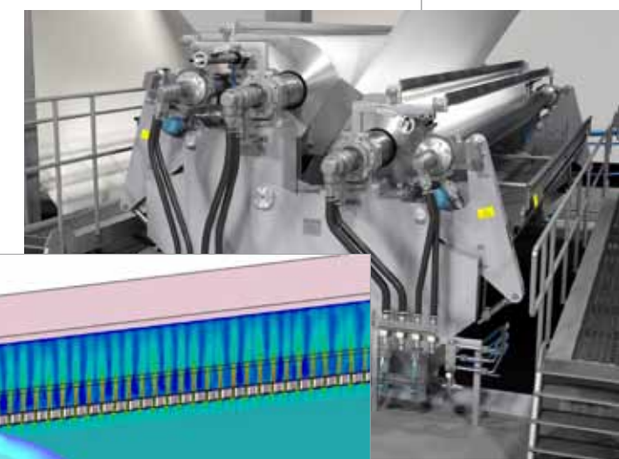
TWIN™ Sizer, INVO® Rod

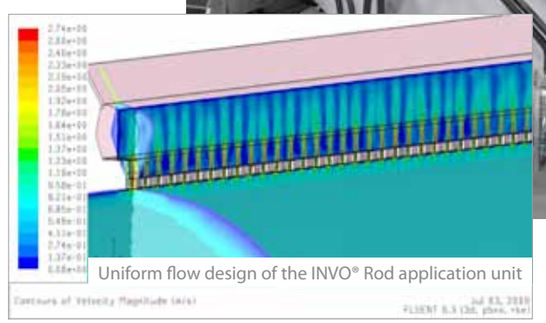
for conventional and proven solutions

The INVO® Rod is designed to give optimized cross and machine distribution and a lot of research has been performed to ensure the flow design of the application unit.
The INVO® Rod unit is supplied with a temperature control system.
The application unit, INVO® Rod, is designed in such a way that different rod diameters can be installed without modifications of the rod holder.

Benefits with the TWIN™ Sizer, Rod:

- **Proven and reliable technology**
- **TWIN™ Sizer, INVO® Rod gives a possibility to run high speed for all base paper applications**
- **Optimal design of the application unit, the INVO® Rod, gives good and uniform cross and machine distribution of the application medium**
- **Stable operation and high availability with compact design**





Uniform flow design of the INVO® Rod application unit

Premetering alternatives

INVO® Rod

The INVO® Rod can be run with volumetric or hydrodynamic premetering principle. The coatweight is primarily controlled by the volume and solids by volumetric principle and by linear load and solids by hydrodynamic principle.

The volumetric Rod is primarily utilized by surface sizing and pigmenting at low solids levels.
The hydrodynamic (Smooth) Rod is utilized by pigmenting/coating where a hydrodynamic pressure is developed, meaning high speeds and high viscosity/ solids.

The INVO® Rod is of special interest by low wet amounts at high speeds where there is no demands on quick coatweights changes.
The most important application is pigmenting/coating on-line printing grades with low pickup/coatweight produced at high speeds. Either for precoating or single coated grades. The INVO® Rod premetering principle can be utilized on transfer roll hardness from 20-70 P&J.

HSM

The HSM premetering is based on the volumetric principle. The coatweight/pickup is primarily controlled by the solids. It is therefore of special interest for low speed combined with high wet applications -High coatweights or big sizing amounts. Applications which gives low hydrodynamic pressures at the metering surface. Particles from base or the coating color passes the metering surface and thus the HSM technology is suitable for coating and surface sizing of base sheets with recycled fibers.

The most important application for HSM technology is surface sizing of liner and fluting. It is also very successful by offset and On-line coated grades based on recycled fibres. It has a unique combination of long service life and volumetric premetering and the wear costs is about 1/5 compared to other premetering techniques. It is a robust and economical solution. The HSM premetering principle can be utilized on transfer rolls with hardness from 30-100 P&J.
The softer the roll the more surface located treatment.

Gravure

The Gravure is a volumetric premetering principle.
It is an indirect premetering method, meaning that the transfer roll surface is protected from wearing by the metering work. This ensures a long lasting good condition of the transfer roll surface and perfect film transfer quality. The coatweight control is extremely efficient by the speed control of the Gravure roll itself. A two-dimensional coatweight control is therefore achieved, meaning that it is possible to apply a certain coatweight at a chosen wet amount by a combination of speed and solids. This is important for quality and energy demand.

The efficient coatweight control is of great interest where quick grade changes or efficient side to side control are needed.
The Gravure has the widest working range of all premetering techniques and runs well from low to high speed with low to high applied weights. The Gravure premetering has the best performance of all premetering techniques and is chosen by installation which has the highest demands. The Gravure premetering can be utilized on transfer roll hardness from 20-100 P&J

TWIN™ Sizer, HSM

for excellent runnability and high availability

The TWIN™ Sizer, HSM technology offers a wide range of application areas, from surface sizing, pigmenting to coating. The forgiving qualities of the HSM, minimal risk of foreign particles collecting in the nip between the premetering element and the transfer roll, permit the use of low-grade base papers from recycled raw material. The HSM technology meets customer expectations when it comes to performance, low maintenance, runnability and final end product quality.

Benefits with the TWIN™ Sizer, HSM:

- Proven and reliable technology with high reference value
- High availability
- Lower production and maintenance costs compared to any other premetering size press on the market
- Stable operation and excellent runnability
- Refurbishment of the metering rolls is fully controlled by the mill utilizing a special wire-winding tool, which is included in the scope of supply
- Volumetric premetering gives good cross machine distribution which results in good coat weight profiles
- Variations in viscosity, reology, temperature and solids are not critical when using HSM volumetric premetering
- Possibility for both down and upwards web run
- Particles passes through the metering zone which results in low risk for scratches and no risk for picking fibers in the base paper

TWIN™ Sizer, Gravure

for new market segments and improved performance

The TWIN™ Sizer, Gravure meets high operational demands with good controllability and availability. The coat weight can easily be controlled in a range from 0,5 g/m2 to 16 g/m2 simply by changing the gravure roll speed. TWIN™ Sizer, Gravure allows starch at high solids levels. 1 g/m2 dry can be applied at 25% solids, reducing drying energy be 75% compared to conventional metering size presses.

Benefits with the TWIN™ Sizer, Gravure:

- Very high repeatability between machine settings and applied coat weight amount
- The Gravure roll surface consists of small cells that are leveled out when the color film is transferred from the Gravure to the transfer roll, resulting in excellent coat weight distribution in both micro and macro scale
- Easy to control the applied coat weight grammage by changing the speed of the gravure roll
- Excellent and equal appearance of the two-sidedness of the paper is easily achieved just by adjusting the speed of the gravure roll
- Reduced energy consumption compared to conventional metering size presses
- Easy to run and stays clean during operation
- The TWIN Sizer, Gravure ensures excellent machine availability and lifetime of the gravure roll more is than 9 months in average
- Long service life of metering elements
- Gives possibility to meet new market trends toward value added products by introducing new packaging board grade with low grammage film coating
- Improve surface sizing on coated liquid packaging board and general packaging board
- Possibility for both down and upwards web run

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