

Phone: +49 211 881-4449
Fax: +49 211 881-774449
Mobile: +49 151 40226502
E-mail: thilo.sagermann@sms-group.com
Thilo Sagermann

PRESS RELEASE

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Additive Manufacturing at SMS group boosts innovation in the production of spray heads

3D spray heads cut cycle time and increase tool service life in closed-die forging

To produce the new 3D spray heads for forging presses, SMS group (www.sms-group.com) takes advantage of the opportunities afforded by additive manufacturing. 3D printing permits extremely light-weight and compact 3D spray heads to be produced that are tailored to the conditions of the respective dies. Flexible actuation of individual nozzles paired with fast handling and a homogeneously distributed mist shortens press cycle times and extends the service life of the dies.

Spray heads fitted in closed-die forging presses serve to remove scale from the dies between the individual press strokes, to cool the surface, to apply lubricants and dry the die surface. Performing these activities, conventional spray heads reach their limits time and again.

Therefore, SMS group began to manufacture such spray heads according to the 3D printing method. The starting material is fine powder based on polyamide, and the result is 3D-printed spray heads that are 90 percent lighter than identical parts made of steel. This allows the use of handling systems faster than those employed before. SMS group offers its customers linear, cam-controlled or

Servo-motor-driven spray systems and industrial robots. The new 3D spray heads shorten the non-productive times of the press and hence raise its output. The little weight of the spray heads facilitates their installation and replacement and, at the same time, reduces wear of the handling systems.

Individually manufactured 3D spray heads

3D printing provides the engineers of SMS group great flexibility in designing 3D spray heads. They are now able to arrange the individual nozzles exactly according to the customers' requirements and even give each nozzle a unique shape.

Actuation of the 3D spray heads, too, offers SMS group completely new options. Each nozzle can now be actuated separately, both for spraying and for separately blowing out atomizer air, either simultaneously or offset in time. Consuming a minimum of spray medium, the heads produce a spray pattern that is homogeneously distributed over the tool surface and, consequently, achieve a long tool service life.

Due to their single-piece structure, 3D spray heads can be used at pressures between three and more than ten bars and are able to generate different spray patterns.

The new 3D spray heads may be installed in new presses, but are also suited for subsequent integration in existing systems.

SMS group designs all 3D spray heads on a largely automated basis and is able to manufacture the parts within a short period. This permits custom-tailored 3D spray heads to be supplied in almost no time.

To the engineers involved, 3D printing offered the opportunity to deviate from the laminar design of the previous generation of spray heads.

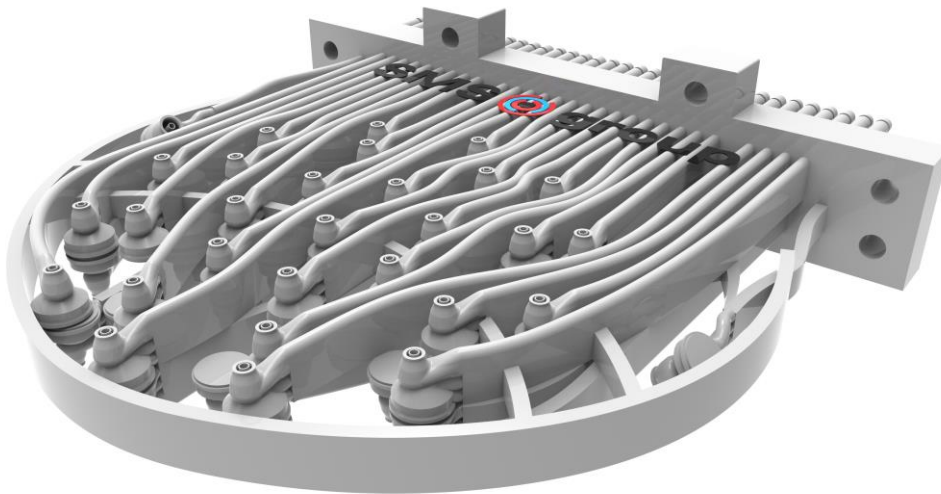
The perforated structure prevents spray medium from accumulating on the spray head. The interior of the individual channels is flow-optimized and precludes the formation of deposits. As 3D spray heads have no parting lines, the spray medium is not exposed to air during downtimes and cannot dry out.

Proven technology taken one step further

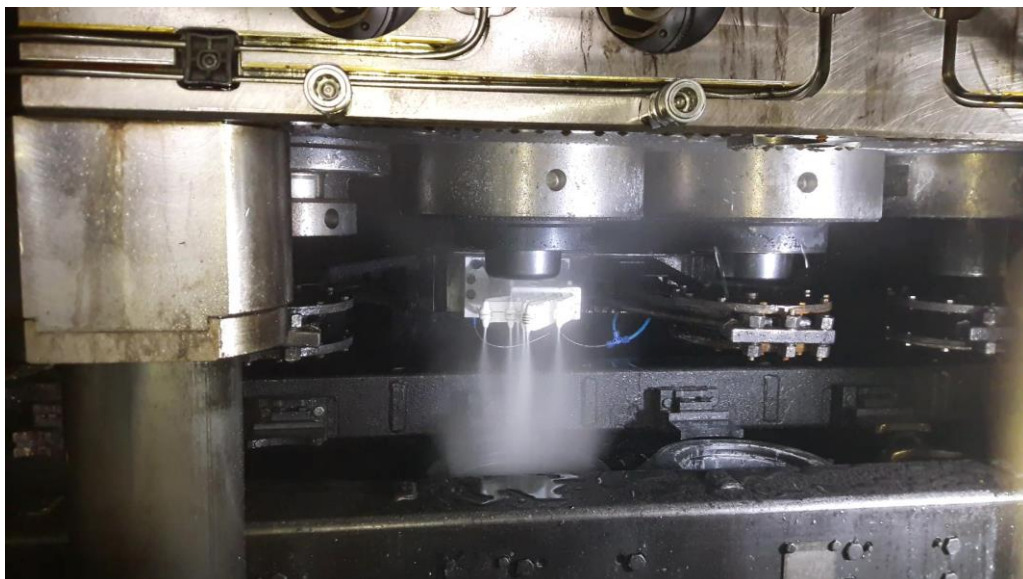
From the proven disk spray heads also developed by SMS group, the design engineers adopted the principle of external-mix two-component nozzles which produce an extremely fine aerosol. Contrary to internal-mix systems, segregation of the individual components cannot occur with this technology.

To switch the nozzles, SMS group continues to use for the 3D spray heads the tried and proven membrane material employed for disk spray heads. The membrane platelets are located directly at the nozzle. The short switching times allow for high dynamics, while dripping is precluded.

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Spray heads printed to the 3D method have less weight, are process-optimized in design and more flexible in use.



3D spray heads in operation: Due to their one-piece design, 3D spray heads can operate at pressures between three and more than ten bars to generate different spray patterns.

SMS group is a group of companies internationally active in plant construction and mechanical engineering for the steel and nonferrous metals industry. It has some 13,500 employees who generate worldwide sales of more than EUR 3 billion. The sole owner of the holding company SMS GmbH is the Familie Weiss Foundation.