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# SAY GOODBYE TO BLOCKAGES

Use of anti-bearding cap nozzles in fluidised bed systems

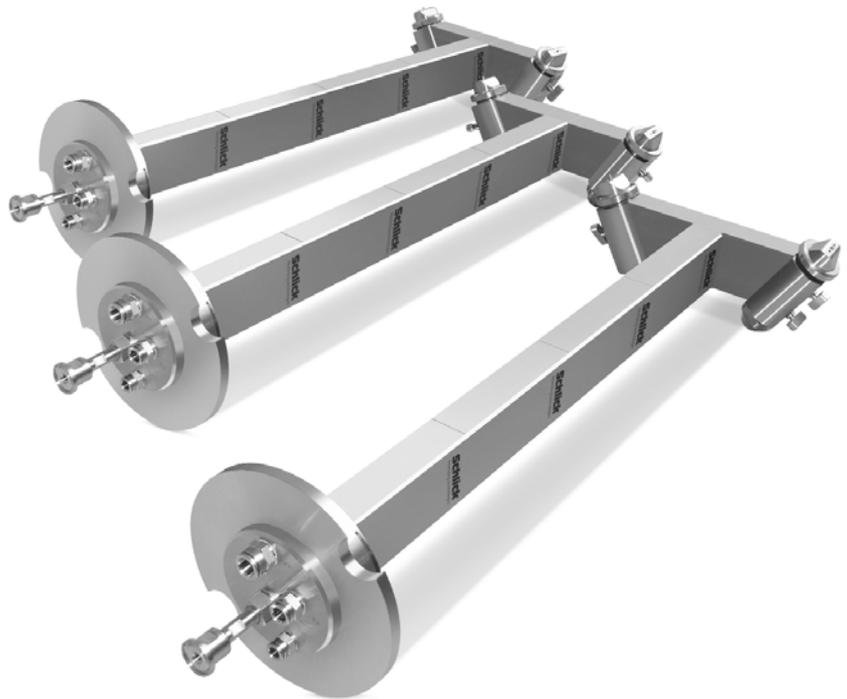
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Blocked spray nozzles are a widespread problem in fluidised bed systems in which very fine or tacky products are processed. By using ABC nozzles, the pharmaceutical excipient manufacturer DMV Fonterra Excipients has succeeded in avoiding unplanned downtimes.

Anti-bearding cap technology (ABC nozzles) is well-established in the field of tablet coatings. The use of these nozzles prevents the spray fittings from becoming blocked and ensures that the spray quality remains consistent. In practice this means an increase in production reliability and greatly simplified, tool-free operation. Furthermore, optimised internal channels prevent sedimentation.

The use of ABC nozzles in fluidised bed systems is, however, new. Until now, multi-head nozzles have been used in this field – a solution which is not without merit. These nozzles are used to distribute the spray liquid over a wider contact area. This would also be possible using many individual nozzles, but the enormous amount of piping needed for this would ultimately lead to the use of one, or in the case of larger system diameters, several multi-head nozzles.

With very fine or extremely tacky products, a film forms on these nozzles and the nozzles regularly become blocked. The cause: dust lands on the nozzle, forms into clumps and blocks the nozzle. The spray from the nozzles then becomes very uneven – often unnoticed at first – which at the very least reduces the productivity of the system, but often also has a negative effect on product quality. If blockages or the like occur, the consequences are often expensive. Investment in system monitoring is also required.

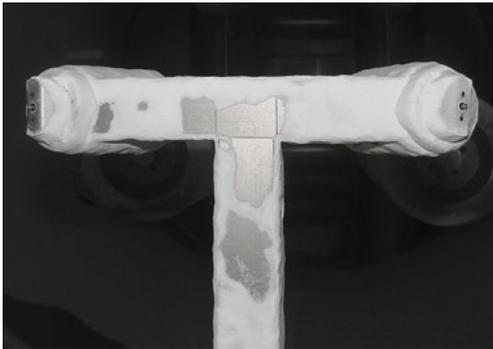


The use of professional coating arms (PCA) fitted with ABC nozzles enables problems caused by blocked nozzles in fluidised bed systems to be avoided.

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One of the old, blocked multi-head nozzles. It is no longer possible for fine droplets to pass through the heavily coated orifice areas; the thick film can also break off.



The new nozzle solution mod. 930/7-1 S68 after use. The orifices of both nozzles are clear and the spray is properly produced.

#### Downtime prevention concept

DMV-Fonterra Excipients (Nörten-Hardenberg, Germany), a leading manufacturer of pharmaceutical excipients, has performed extensive tests in order to solve this problem. The intention was to find a replacement for the existing multi-head nozzles because, with certain products, problems with blockages and/or film formation occurred on a regular basis. Initially, test series with individual nozzles from the ABC range were produced (mod. 930/7-1 S35), with the first results already proving encouraging. However, the piping required for supplying the six nozzles used was complicated and difficult to clean. Once the fundamental spraying parameters had been determined, the ABC concept was transferred to a design involving three nozzle arms (PCA), which was specially adapted for the fluidised bed systems.

The professional coating arm (PCA) is also already familiar from the coating field. There, the ABC nozzles are attached to a supply arm, similar to a manifold arrangement. The design is characterised by a very even supply to each of the nozzles and the fact that the nozzles are always correctly positioned. There are no longer any individual hoses in the production area, but the nozzle arm can still be completely and easily dismantled. This means that the PCA can be cleaned and inspected effectively and with precision. The short parts mean that, for example, it is possible to use a conventional ultrasound cleaning device.

The three spray arms have been fitted with mounting flanges suitable for the existing system, which means that conversion work is kept to a minimum. Production can now – especially for problematic products – run far more smoothly and without interruptions, which was not possible before. "The use of the new nozzles means that it has been possible to increase the lifespan and production rate, as the problems with blockages/caking around the liquid inserts/air caps have been eliminated," summarises Maik Bleßmann, Technology Team Leader at DMV Fonterra Excipients.

**Conclusion:** Even with a difficult product, the implementation of the PCA/ABC concept as part of this project was relatively problem-free. The concept provides a modern solution for use in fluidised bed systems. The spray systems can each be individually adapted, which means that retrofitting is also possible. The installation sockets for existing nozzles can generally be used. Only the control of the operating modes may need to be readjusted for fully automated systems.