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## *Tablet design, quality affect coating quality*

The near-total replacement of organic solvents with water in tablet coating solutions is one of the biggest changes to the tablet coating process in the last two decades. While the switch lowered costs and improved safety, it made the process less forgiving and thus increased the need to tightly control solution delivery and process temperature. The switch also made tablet design, tablet quality, and batch-to-batch product volume more important.

You'll spare yourself a lot of coating headaches if you design your tablet in a way that prevents the coating from filling in and bridging the embossed lettering, logos, and bisects. Good design also helps prevent tablets from sticking to each other (twinning) during coating. But the trend today is toward more complex tablet shapes and embossing, and that means you have to give tablet coating special consideration to head off problems.

You must also recognize that tablet quality affects coating quality. That means you must monitor production and supply the coating department with consistent cores. (A tablet destined for coating is called a core.) The core surface must have consistent hardness and porosity. The cores must also be dust free, so don't minimize the importance of the dedusting and preheating cycle after

you've (gently) loaded the tablets into the pan. As for core quality, one or two bad cores—either too soft or too hard—can ruin the entire batch. Exposing a soft core to the liquid coating may erode its surface or break it apart. These fragments then mix with the coating and dull or mar the finish of all the tablets in the batch. Cores that are too hard or insufficiently porous may not allow the coating solution to "lock" onto the core surface, and the coating may peel off in flakes. These flakes can then cling to the surface of other tablets and ruin the batch.

You must also keep an eye on batch-to-batch product volume in order to achieve good, repeatable coating results. The smaller the variation in product volume, the greater the coating consistency. After all, if you increase the product volume, the tablet bed moves closer to the nozzles, potentially causing over-wetting, which can result in defects such as mottling, sticking, and picking. Conversely, if you decrease the product volume, the tablet bed moves away from the nozzles, potentially causing the coating solution to over-dry before it reaches the tablet surface. This can result in a "spray drying" defect, which occurs when the coating droplets dry before they reach the tablet surface. That prevents most of the coating from

adhering and gives the tablet a fuzzy surface. If you don't correct the settings immediately to mitigate the problem, you will likely have to scrap the entire batch.

Of course, there are a lot of other variables in tablet coating, so scrutinize each process step and each component, including the coating pan, air handling and conditioning system, spray guns, solution pump, dust collector, and controls. You may even want to re-evaluate your coating solution. Years back, most companies made their own coatings, but today there are many suppliers of high-quality ready-mix coating solutions.

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