

# How to stay sharp

BKS re-sharpens knives for strand and die-face pelletizers at its plants in Belgium and Malaysia. It also regrinds die plates and offers repair services. It has looked at the optimisation of cutting performance in strand pelletizing systems and provides the following advice.

Factors that can be controlled by the compounder include strand temperature. Strand temperatures should be as high as possible to reduce the risk of breakages, but they should be low enough to ensure that pellets do not stick together after cutting.

BKS highlights the importance of having a homogenous temperature across the cross-section of the strand prior to pelletizing. It says that if the stand is cool on the outside, but still hot or even liquid on the inside, then it increases the risk of creating dust and fines and it will reduce the lifetime of cutting tools.

Clearly the number of cuts also



**BKS carries out precision grinding to re-sharpen cutting rotors**

influences knife longevity, as does the diameter of the strand. Optimal distribution of the strands along the cutting width helps to extend cutting tool lifetimes. Corrosion of cutting tools can be caused by the compound formulation or contaminated cooling water, while wear rates will be increased by abrasive ingredients in the material being processed.

Cutting gap adjustment also plays an important role – the smaller the gap between the rotor and the bed knife, the

better the cutting quality and the longevity of the cutting tools. In addition, the geometry of the rotor knife is a crucial factor, with the helix, rake and relief angle all having a strong influence on cutting performance.

The materials used for the cutting tools also play a critical part in resisting wear and corrosion. Options for bed-knife materials include tungsten carbide, ceramics, Stellite or diamond. The choice for rotor knife materials extends to tool and stainless steels, tungsten carbide, Stellite and materials made using powder metallurgy.

The re-sharpening of cutting tools has a direct influence on the performance and longevity of pelletizers and requires know-how to maintain optimised geometries. Similarly, the thorough maintenance of the bearings is vital to ensure the concentricity of the rotor which has a direct impact on the cutting gap.

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pump, heat exchanger blockages, or dust in the final product. Simon says that while traditional water filtration systems for underwater pelletizers have difficulty filtering these high contamination levels, BKG's Optigon line efficiently filters particles under 70 microns. The system detects the level of contamination in the filter and automatically rotates and cleans the filter elements. BKG suggests using a continuously operated band filter.

**Automatik's** Duro belt dryer is an alternative solution for abrasive compounds that might cause wear in traditional impact or centrifugal dryers, as well as for brittle or chalky compounds that might produce excessive dust. Automatik, which supplies both strand and underwater pelletizing equipment, has successfully introduced to the market this relatively new type of patented pellet dryer for underwater pelletizers. In this system, most of the water is removed in a pre-dewater-

This technology is low maintenance and reduces energy consumption, notes Mueller.

The patent-pending Flux Die Plate from underwater pelletizer supplier **Gala Industries** uses special insulation and manufacturing techniques that provide several advantages for temperature-sensitive materials. The technology reduces pressure drop across the extrusion land by 40-50% and reduces power consumption by 70%, says John Roberts, global sales market manager at Gala. The die plate allows a broader window of operation because it is less sensitive to rate fluctuation and upstream pressure requirements. Gala has also developed a patent-pending rotary clamp design with a safety locking feature. This clamp offers simple, single-handed operation for opening and closing the clamp, while also providing an additional level of safety for the operators.

**Davis-Standard's Black Clawson Converting**