



## ENGEL onyx

# New wear protection system for screws

**Schwertberg/Austria – May 2009. Plastics with modified characteristics play an increasingly important role in the industry. Mineral additives or glass fibres in particular are very demanding on the wear resilience of the plasticising components. ENGEL now offers carbide coating for screws under the "ENGEL onyx" product name. This improved both the coating toughness and the bonding force by 300 percent. At the same time, further improvements of abrasion resilience were achieved. "Onyx screws" are available in the 25 to 70 mm diameter range.**

Carbide metal coated plasticising screws are essential for processing technical composites with a high additive level to achieve economically viable lifecycles. The carbide coating ensures the required abrasion resilience; the underlying steel handles the mechanical loads, and guarantees a high level of safety in case of impact stress due to excellent strength characteristics. The development project by ENGEL Material Technology was launched with the aim of improving the mechanical characteristics of a carbide-steel composite to an extent that the great potential of carbide could be used for wear protection in long term production applications.

### **Highly wear resistant coating**

The unique selling point of the new ENGEL onyx carbide metal coating is the evenly spread coating of carbide metal over the whole screw contour and its extremely high bonding potential. The new system is characterised in particular by its improved robustness. The drop hammer impact test results provide proof of its success. Compared to other coating systems, the maximum drop impact force before initial cracking occurred was up to 300 percent higher.



Additionally, the annealing process was considerably improved to boost bonding force. While standard HVOF (High Velocity Oxygen Fuel) coatings achieve bonding levels of just 90 to 110 MPa, the ENGEL onyx coating system achieves bonding values of 250 to 350 MPa (Fig. 5). The practical benefit of these improved values is the considerable increase in protection against cracking, and mitigation of the danger of layers of coating stripping.

This composite material made of a tough basic material and a highly abrasion resilient coating is interesting from an economic point of view due to its local tailor-made properties and the excellent lifetimes they enable.

Thanks to the onyx wear protection system for plasticising screws, screw channel geometry is more or less stable due to the low level of wear, thus enabling a stable process window for extended periods of time even in the processing of plastics with a high additive content.

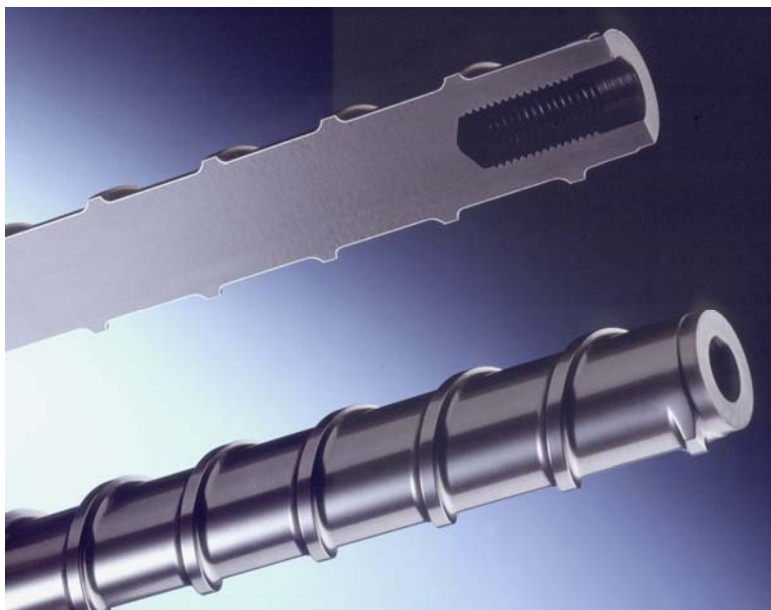


Fig.: The unique selling point of the highly wear resistant ENGEL onyx screw system is the evenly spread carbide metal coating over the whole screw contour and its extremely high bonding potential.



### **ENGEL Austria GmbH**

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