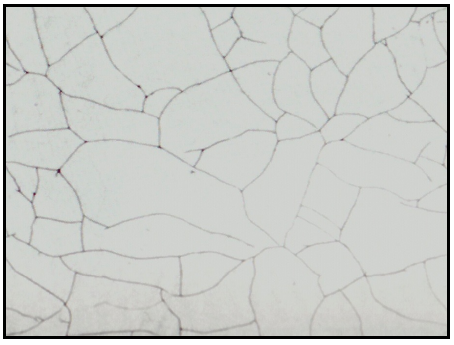
Melt conveyance and Lunac

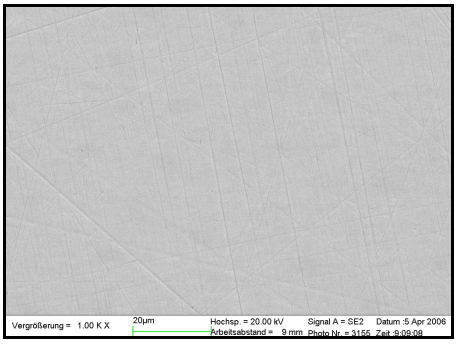
April 2006

An often observed problem in plastic processing is the presence of die lines in the final products. Mostly the extrusion heads are judged to be mainly responsible for this. Consequently, possible bad non stick characteristics in the exit zone are closely studied, because of the appearance of edge build up in this zone. These contaminations create product die lines indeed. Mostly this is the consequence of a more deep down problem. Locally disturbed melt conveyance patterns of the plastics on the tool walls can be related to irregular build up of the die edges. Principally, plastics consist of a mixture of substances. Some of these could be fluids (to assist a better melt flow in the tools). These agents should stay finely distributed in the molten or solid plastics. This is not always the case. These fractions can separate and lead to gel formation. A clear relationship seems to be present between the smoothness/homogeneousness of an applied tooling material and the sticking problem, besides the surface energy (related to the tendency to bind other materials) of a tool. A deposited spot on the inner wall of the tool can cause a track all way down to the exit zone and develop an edge build up spot! Steel is fairly inhomogeneous and possesses a relatively high surface energy. Although hard chromium reduces the surface-energy, the microcracked, melt flow inhibiting surface limits its use for solving some melt conveying problems. Lunac 1 is very homogeneous, crack free and possesses a significantly reduced surface energy. This mostly offers an seriously improved melt conveyance and less or no edge build up anymore according to the amount of parts being coated in the direction of the screw. Consequently, only Lunac 1 coated dies do not offer the maximum obtainable non edge build up effect. An additional method to reduce the edge build up is by simply applying a circular compressed air stream around the die-edge. These sticking problems in the tools can of course propagate plastic degradation/burning as well, leading to discolourations in the end products.



Left: SEM picture chromium plated and polished surface

Right: SEM picture polished surface coated with Lunac 1



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