



## VISUALIZATION ANALYSIS ON WRINKLE GENERATION PHENOMENA CAUSED BY BREAKING-UP OF SOLIDIFIED LAYER DURING CAVITY FILLING PROCESS

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In products molded by POM, molding defects other than normal weld-lines such as the generation of numerous wrinkles can be seen around the boss portion. In this study, the authors attempted to analyze how these wrinkles form in a boss cavity with core-pin, through static visualization using the colored marking method on a high speed rotary runner exchange system and X-ray CT, as well as dynamic visualization using a glass-inserted mold. The results obtained indicated that (1) in the area where the resin contacts the cavity wall at the upstream side about 10 mm from the flow front, the skin layer once formed by cooling breaks up into resin bits in the flow process, (2) these resin bits flow smoothly on the cavity surface and stops at the endpoint of the flow, and (3) numerous wrinkles are formed as external defect around the resin bits of this broken-up skin layer. The above-mentioned results for the first time reveal a quite important phenomenon which is beyond the general understanding of injection molding process; the solidified layer, so-called skin layer, can be broken up even during the cavity filling process by shear flow of the inner layer, and move downstream, because the shear force acting on this skin layer exceeds the strength of the layer as well as the fixing force of the resins to the cavity surface.