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Surface Glossy Difference on Water Assisted Injection Molded Thermoplastic Parts: Effects of Processing Variables

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This study is devoted to investigating the glossy difference phenomenon occurring on the surface of water assisted injection molded parts. Experiments were carried out on an 80-ton injection-molding machine equipped with a lab scale water injection system, which included a water pump, a water injection pin, a water tank equipped with a temperature regulator, and a control circuit. The material used was pigmented polypropylene. It was found that surface glossy difference mainly occurs in the rib/plate transition area of molded parts and is resulted from the roughness gradient of parts' surface. Crystallinity as well as the shear stress in molded materials may be the factors leading to the roughness gradient of the surfaces.