Suitability of Screw Plasticization for Autosterile Injection Molding

Single use medical products are subject to subsequent sterilization treatment following manufacturing processes, for example, injection molding, to obtain sterility. A new approach is developed to use the injection-molding process to produce sterilized products without an additional sterilization procedure. To achieve the aim of an autosterile injection molding, it is necessary to evaluate the sterilization impact of screw plasticization regarding sterile polymer melts before entering the injection mold cavity. Within this study, a screw plasticization unit is fed with defined contaminated polymer granules. Geobacillus stearothermophilus spores are used as challenge organisms to determine the sterility grade of screw plasticization. The investigation includes method verification and the experimental testing of polyoxymethylene, polyethylene, and cyclo-olefin copolymer melts at different melt temperatures of 200°C and 280°C. © 2013 Wiley Periodicals, Inc. Adv Polym Technol 2014, 33, 21403; View this article online at wileyonlinelibrary.com. DOI 10.1002/adv.21403

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