

Extraction of paraffin wax binder from metal injection molding (MIM) by supercritical carbon dioxide

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In metal injection molding (MIM) process, binder removal is one of the most critical steps in the MIM process due to defects that can be produced by inadequate binder removal, like bloating, blistering, surface cracking and large internal voids. The purpose of this experiment was to suggest methods of improving supercritical fluids debinding and reducing debinding time. The effects of process variables such as pressure, temperature on the binder removal rate in the metal injection molding have been investigated. Experimental results lead us to the conclusion that density of supercritical fluids is important to reduce debinding time and the extraction temperature should be higher than melting point of paraffin wax. Totally, supercritical debinding save time and energy and also offer safe working environment so the supercritical debinding can be alternative to the conventional debinding methods.