

METHOD TO FORM MULTI-MATERIAL COMPONENTS

ABSTRACT

The invention shows how powder injection molding may be used to form a continuous body having multiple parts, each of which has different physical properties such as magnetic characteristics or hardness. This is accomplished through careful control of the relative shrinkage rates of these various parts. Additionally, care is taken to ensure that only certain selected physical properties are allowed to differ between the parts while others may be altered through relatively small changes in the composition of the feedstocks used. An additional application of the present invention is a process for forming, in a single integrated operation, an object that is contained within an enclosure while not being attached to said enclosure. This is accomplished by causing the shrinkage rate of the object to be substantially greater than that of the enclosure. As a result, after sintering, the object is found to have detached itself from the enclosure and is free to move around therein. Several examples of structures formed using these processes are presented.

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