

CATAMOLD™-A NEW DIRECTION
FOR POWDER INJECTION MOLDING

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1. Introduction

Powder Injection Molding(PIM) is an attractive and expanding manufacturing technology. Recently, technical hurdles which have been inhibiting the expected growth for thirty years, have been overcome to a significant extent.

Academic as well as industrial R&D was highly instrumental in major accomplishments.

Growth also has been delayed for economical reasons. Due to relatively high manufacturing costs, application so far restricted to niche markets. High manufacturing costs still prevent a major penetration of automotive end-uses. In addition, there still are technical challenges which have been delaying the development of automotive and other applications.

For such reasons, production of metal parts by PIM still focuses on

- Computers and related equipment
- medical devices
- tooling and textile machinery as well as watches and sporting equipment

At the present time, major commercial and semicommercial applications of PIM still are restricted to metals. This technology is referred to as Metal Injection Molding(MIM).

BASF at a very early stage, got involved into PIM. Starting point was the Corporation's sortment to continue to lead the forefront of technology in Carbonyl Iron Powder. From day one on this unique material was a "work horse" in PIM. BASF's Carbonyl Iron Powder was used for the initial basic research as well as for the first test production. BASF, world's largest manufacturer of Carbonyl Iron Powder, successfully developed several Carbonyl Iron Powder grades, geared to the needs of MIM industry. As an example, BASF's "OM" grade is the world's standard in MIM markets.

The Carbonyl Iron Powder properties required for the MIM process are:

- It's extreme small particles size results in highest sintering activity,
- It's perfectly round particles exhibit rheological advantages during the molding process,
- It's easily can be blended with other metal powders because it doesn't agglomerate much.

Recently, BASF's involvement into Carbonyl Iron Powder and PIM resulted in the development of an innovative, break through MIM system. It is based on polyacetal type binders, and the acid catalyzed depolymerization during the debinding step.

BASF's new proprietary technology is marketed as the Catamold™ system. The technology package includes supply of commercial quantities of the new MIM feedstock as well as comprehensive technical service.

In this paper, Catomold™ is presented, both from a technical as well as from a commercial point of view. Advantage over conventional MIM technology are highlighted, newest developments will be shown.