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Low Pressure Powder Injection Moulding of High Speed Steel Powders

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The relevance of the powder injection moulding PIM is most certainly due to its actual technological competitiveness, part design and process automation easiness, and mainly to the forming of small dimension parts with complex shapes possibility. Low-Pressure Powder injection moulding was used to obtain AISI T15 high speed steel parts. The binders used were based on carnauba wax, paraffin and low density polyethylene. The metal Powders were characterised in terms of morphology, particle size distribution and specific surface area. The mixture was injected in the shape of square bar specimens to evaluate the performance of the injection process in the green state, and after sintering. The parameters such as injection pressure, viscosity and temperature were analysed for process optimisation. The binders were thermally removed in low vacuum with the assistance of alumina Powders. Debinding and sintering were performed in a single step. This procedure shortened considerably the debinding and sintering time.