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Investigation into the differences chemical properties of laser sintering polymer powders using Fourier transform infrared spectroscopy (Conference Paper)

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Abstract

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Selective Laser Sintering (SLS) or Laser Sintering (LS) allows functional parts to be produced in a wide range of powdered materials using a dedicated machine, and is thus gaining popularity within the field of Rapid Prototyping (RP). One of the advantages of employing LS is that the loose powder of the building chamber can be recycled. The properties of polymer powder significantly influence the melt viscosity and sintering mechanism during Laser Sintering (LS) processes which results in a good surface finish. The objective of this research is to investigate the chemical composition of fresh polymer materials used in Laser Sintering. There are seven virgin SLS materials which are PA2200, GF3200, Alumide, PrimeCast, PrimePart, Duraflex and CastForm. Fourier Transform Infrared Spectroscopy (FTIR) was used to analyze the chemical composition of the materials by using infrared radiation and absorbed frequency. The spectra show that similar functional groups were found in the materials apart from PrimePart and Duraflex. Obtained data from this analysis could be used to investigate on how the fresh and recycled powder materials with different chemical properties would affect the part surface finish. © (2014) Trans Tech Publications, Switzerland.

Author keywords

Chemical properties Fourier transform infrared spectroscopy Laser sintering Polyamide-base-powder

Indexed keywords

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