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Laser applications in pharmaceutical industry

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Laser technology has made rapid progress over the last decade in many different fields, and its applications in the pharmaceutical industry are increasing day by day. The most common applications that can be mentioned currently in this context is the encoding information on conventional dosage forms for anti-counterfeiting or personalization purposes and the use of laser in three-dimensional (3D) printing, especially Selective Laser Sintering (SLS), and this technique relies briefly on directing laser towards powder bed and drawing a 3D model by sintering the powder particles on the surface layer by layer. SLS is superior to other techniques in some features, the most important of which are: a solvent-free process and it does not require pre-production of the filaments as with Fused Deposition Modelling (FDM). On the other hand, this technology suffers from a major drawback, which is the concern about the degradation of drugs by the used laser.

From the foregoing, this research aimed to study the effect of various lasers on different active pharmaceutical ingredients and polymers to determine the suitable and stable materials and settings for SLS 3DP technology, and furthermore to reveal the applicability of sintering in the tailoring of the drug release of conventional solid dosage forms.