



**CERTIFICATE**

This is certified that **Vaibhav Upadhyaya** of B.Tech. 3<sup>rd</sup> year has successfully prepared a seminar report on “**Selective Laser Sintering Process**” for partial fulfilment of requirement for the award of degree of **Bachelor of Technology in Mechanical Engineering** from **Kamla Nehru Institute of Technology, Sultanpur** during the academic year 2017-18 under my guidance and supervision.

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## **ACKNOWLEDGEMENT**

I have immense pleasure to present this seminar on **SELECTIVE LASER SINTERING PROCESS**, a topic of my personal interest. I take this opportunity to express my profound gratitude and deepest regards to my seminar guide **Prof. Anshul Yadav (Deptt. of Mechanical Engg.)** for his exemplary valuable information and guidance, monitoring and constant encouragement throughout the preparation of this seminar report.

I sincerely express my gratitude to all other teachers and faculty members of this institution for their cordial support, valuable information and guidance which helped me in preparation of my seminar report.

Lastly, I thank my friends who helped me a lot in finalizing this report by giving their valuable suggestions related to my topic.

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## **ABSTRACT**

This seminar report gives an overview of history of SLS and process involved in SLS, principal parts of SLS machine which include laser, powder feeder and enclosed chamber for controlling the environment. After this we deal about the physical phenomenon involved in SLS process such as heat generation and transfer, microstructure evaluation, fluid effects. In SLS process we use the material in powdered form and heat below melting point. Some of the materials used in SLS process are thermoplastics (nylon, polyesters, waxes, etc.), completion materials etc. In experimental details we deal with bonding adhesion mechanisms after this we discuss about experimental parameters which include powder size, scanning speed, powder density, laser performance etc. In SLS process laser beam converted into thermal energy that causes heating of the powder bed.

This seminar report at last deals with the various application of SLS process in various fields such as Investment casting wax, Aerospace parts, awards, Surgical guides, Polycarbonate etc. An example of new application is Nylon. Finally we deal with advantages, limitations of SLS process and characteristics of SLS produced parts. At last we draw conclusion of whole seminar report.

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## LIST OF SYMBOLS AND ABBREVIATIONS

1. SLS.....selective laser sintering
2. CAD.....computer aided design
3. STL.....stereolithography
4. UT.....University of Texas
5. PGLSS.....part generation by layer wise selective sintering
6. PA.....Polyamide
7. PAGF.....Polyamide glass filled