1.3.3: Number of students undertaking project work/field work/internship during last year

Dept: M.E. Manufacturing Engineering **Academic Year-2023-2024**

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

EXTRUSION - BASED IN FUSED DEPOSITION ON PLASTIC INJECTION MOLDING

PHASE II REPORT

Submitted by

G.RAJA *812422410003*

in partial fulfillment for the award of the degree

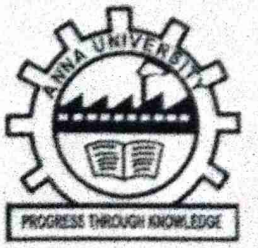
of

MASTER OF ENGINEERING

IN

MANUFACTURING ENGINEERING

M.I.E.T. ENGINEERING COLLEGE
TRICHIRAPALLI – 620007



ANNA UNIVERSITY: CHENNAI 600 025

AUGUST 2024

ANNA UNIVERSITY,CHENNAI 600 025

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BONAFIDE CERTIFICATE

Certified that this project report "**EXTRUSION-BASED IN FUSED DEPOSITION ON PLASTIC INJECTION MOLDING**" is the Bonafide work of **G. RAJA (812422410003)** and who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not from part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr. B. SELVAM, M.Tech., Ph.D.

HEAD OF THE DEPARTMENT

Department of Mechanical Engineering

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Submitted to the Project viva voce held on 16/08/2024

16/08/2024

INTERNAL EXAMINER

EXTERNAL EXAMINER

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

CERTIFICATION OF EVALUATION

College Name : M.I.E.T. ENGINEERING COLLEGE

Department : MANUFACTURING ENGINEERING

Semester : IV

S.No	Name of students	Title of project	Name of the Supervisor with Designation
1	G. RAJA (RI2422410003)	EXTRUSION - BASED IN FUSED DEPOSITION ON PLASTIC INJECTION MOLDING	Dr. B. SELVAM , M.Tech., Ph.D (SUPERVISOR) DEPARTMENT OF MECHANICAL ENGINEERING M.I.E.T. ENGINEERING COLLEGE TIRUCHIRAPPALI - 620007

The report of the project work submitted by the above students in partial Fulfilment of the award of Master of Engineering Degree in Manufacturing Engineering of Anna University is evaluated and confirmed to be the report of the work done by the above students.

Submitted for the Anna university examination held on 16/08/2024

16/08/2024

INTERNAL EXAMINER

EXTERNAL EXAMINER

PRINCIPAL
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ABSTRACT

Injection moulding can be performed with a host of material mainly including metals, glasses elastomers and most commonly thermoplastic and thermo setting polymers . Material for the part is fed into a heated parrel mixed using a helical screw and injected in to a mould cavity where it cools and harden to the configuration of the cavity. After a product is designed, usually by an with industrial designer or engineer. Moulds are made by a mould-maker (or tool maker) from metal usually either or thermoplastic, and precision-machined to from the features of the desired part injection moulding is widely used for manufacturing a variety of parts, from the smallest entire to components body panels of cars. Advanced 3D printing technology, using photopolymers that do not melt during the injection moulding of some lower-temperature thermoplastics, can be used for some simple injection moulds, An injection moulding machine. Uses a special – purpose machine that has three parts : the injection unit, the mould and the clamp. Parts to be injection moulded be must very carefully designed to facilitate the moulding process :the material used for the part, the desired shape and features of the part, the material of the mould, and the properties of the mould machine must all be taken into account. The versatility of injection moulding is facilitated by this breadth of design considerations and possibilities.

CHAPTER 5
CONCLUSION

5.1 Conclusion

Injection molding is one of the most important processes for plastics and it has a very wide list of kinds of products it can produce, which makes it very versatile.

The portable direct extrusion machine was designed and developed for making extrusion of various non-ferrous alloys having recrystallization temperature of 160°C Mechanical tests such as density, hardness and toughness for extruded thermo plastic and the following conclusions are made from the experimental investigations.

1. The portable direct extrusion machine can be used to the maximum billet heating temperature of180°C.
2. Extrusion of various non-ferrous metals and alloys billets can be made into rods,
3. The maximum relative density of 98.14% was obtained and it can be applied as secondary manufacturing process.
4. The portable machine is capable to measure the heating coil temperature as well as inside billet temperature
5. The extruded hardness was very closure to the actual theoretical hardness value. The relative hardness value of 96.67% was determined after extrusion.
6. There was no cracks and hot tears were not identified on the extruded.
7. The toughness value was determined and it is very closure to the other researcher values.

EXTRUSION – BASED ADDITIVE MANUFACTURING IN (FDM) 3D PRINTING TECHNOLOGIES

PHASE II REPORT

Submitted by

C.CHANDRAN **812422410501**

In partial fulfillment for the award of the degree

of

MASTER OF ENGINEERING

IN

MANUFACTURING ENGINEERING

M.I.E.T.ENGINEERING COLLEGE

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AUGUST 2024

PRINCIPAL
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GUNDUR, TIRUCHIRAPALLI - 620 007

ANNA UNIVERSITY;CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this report **"EXTRUSION –BASED ADDITIVE MANUFACTURING IN (FDM) 3D PRINTING TECHNONOGIES"** is the Bonafide work of C.CHANDRAN(812422410501) and who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not from part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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16/08/2024

INTERNAL EXAMINER

PRINCIPAL
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EXTERNAL EXAMINER

CERTIFICATION OF EVALUATION

College Name : M.I.E.T. ENGINEERING COLLEGE

Department : MANUFACTURING ENGINEERING

Semester : IV

S.No	Name of students	Title of project	Name of the Supervisor with Designation
1	. CHANDRAN 812422410501	EXTRUSION – BASED ADDITIVE MANUFACTURING IN (FDM) 3D PRINTING TECHNOLOGIES	Dr.B. SELVAM, M.Tech.,Ph.D. Supervisor Dept. of Mechanical Engineering M.I.E.T. Engineering College Tiruchirappalli-620007

The report of the project work submitted by the above students in partial Fulfilment of the award of Master of Engineering Degree in Manufacturing Engineering of Anna University is evaluated and confirmed to be the report of the work done by the above students.

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ABSTRACT

3D printing is a form of additive manufacturing technology where a three dimensional object is created by laying down successive layers of material. It is also known as rapid prototyping, Is a mechanized method where 3D object are quickly made on reasonably sized machine connect to a computer containing blueprints for the object. The 3D printing concept of custom manufacturing is exciting to nearly everyone.

This revolutionary method for creating 3D models with the use of inkjet technology saves time and cost b eliminating the need to design; print and glue together separate model parts. Now, you can create a complete model in a single process using 3D printing. The basic principles include material cartridge, flexibility of output, and translation of code into a visible pattern.

3D printers are machines that produce physical 3D models from digital data by printing layer by layer. It can make physical models of objects either designed with a CAD program or scanned with a 3D scanner. It is used in a variety of industries including jewellery, footwear, industrial design, architecture, engineering and construction, automotive, aerospace, dental and medical industries, education and consumer products.

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CHAPTER 9
CONCLUSION

The outcome of this project was to build a portable 3D Printer which has been successfully completed. The design of the frame is made robust and compact using aluminum sections. The material selection of the various elements is economical. Using lemotor for vertical movement along with a proximity sensor makes bed leveling easy and the bed movement is monitored with resolution in microns. The drawback in few of the 3D Printer which uses bed movement in Y axis has distortion of the printed layer at high rates of printing. To overcome this drawback, a new mechanism has been developed which uses bed movement in Z. The control of the mechanism becomes easy because of less number of motors and good synchronization can be achieved using this new 3D printer technique..