



Experimental investigation on Al7075/SiC fabrication by Friction stir processing.

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Submitted By : Dr. Dharanalakota SCH Mouli

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PROPOSAL DETAILS

(CRG/2023/001643)

Dr. Dharanalakota SCH Mouli

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ASSISTANT PROFESSOR (MECHANICAL
ENGINEERING)

Malla Reddy Engineering College

Maisammaguda, dhulapally (post via. kompally), secunderabad,
rangareddy dt, Hyderabad, Telangana-500100

Technical Details :

Scheme :	Core Research Grant		
Research Area :	Mechanical & Manufacturing Engineering & Robotics (Engineering Sciences)		
Duration :	36 Months	Contact No :	+919491518360
Date of Birth :	01-Aug-1988		
Nationality :	INDIAN	Total Cost (INR) :	34,95,200
Is PI from National Laboratory/Research Institution ?	No		

Project Summary :

Friction stir processing is an extension of friction stir welding which was developed to weld metals in solid state by employing the tool. FSP is an emerging metalworking technique that can provide localized modification and control of microstructures in near-surface layers of processed metallic components. The FSP causes intense plastic deformation, material mixing, and thermal exposure, resulting in significant microstructural refinement, densification, and homogeneity of the processed zone. The FSP technique has been successfully used for producing the fine-grained structure and surface composite, modifying the microstructure of materials, and synthesizing the composite and intermetallic compound in situ. The FSP is used when metals properties want to be improved using other metals for support and improvement of the first. This is promising process for the automotive and aerospace industries where new material will need to be developed to improve resistance to wear, creep, and fatigue. Examples of some materials successfully processed using the friction stir technique include AA 2519, AA 5083 and AA 7075 aluminum alloys, AZ61 magnesium alloy, nickel-aluminium bronze and 304L stainless steel. It would also include mg and its alloy materials

Objectives :

Mechanical characterization of Al7075/SiC surface composites was investigated in this study to give knowledge of manufacturing for SiC particles (SiCs) reinforced, mechanical behaviour, and an understanding of surface attributes like mechanical and tribological properties. Other than pure metals, research on Al7075/SiC surface composites will lead to possible industrial uses. Attention should be paid to the homogenous dispersion method of SiCs in Al7075 matrix and effective bonding technique between the matrix and SiCs when producing the mass scale of Al7075/SiC composites. Particular care should be taken to avoid SiCs damage during solid state processing. To better understand the strengthening mechanisms and achieve high performance, theoretical investigations of SiCs reinforced Al alloys, incorporating the interactions between processing parameters, micro and nano-structures, might be done. Before, various techniques were used to improve surface qualities, but they had a negative impact on the environment and health concerns due to the release of hazardous gases. Thus, among the numerous surface modification procedures, contemporary techniques such as friction stir processing have recently been applied to resolve those difficulties. Al7075/SiC surface composites are widely employed in a variety of applications due to their characteristics such as low density, machinability, durability, low weight-high strength ratio, superior corrosion abrasion, and wear resistance.

Keywords :

Friction stir processing, Al7075/SiC, Tribology and Optimization

Expected Output and Outcome of the proposal :

Al7075./SiC composites have been researched in this study to give knowledge of manufacturing for SiCs reinforced Al7075. mechanical behaviour as well as understanding the characteristics. Other than pure metals, research on Al7075/SiC metal matrix composites will lead to possible industrial uses.

Suitability of the proposed work in major national initiatives of the Government:

Make in India, Startup India

Theme of Proposed Work:

Manufacturing, Materials

Collaboration Details for last 5 Years :

Planned Collaboration for the proposed work with any foreign scientist/ institution ?

No

1. Origin of the proposal

Several new generation materials have emerged as a result of extensive study in the fields of material science and engineering. Hybrid metal matrix composites are one example of a next generation material development. Metal matrix composites have been created to address weaknesses in standard metals such as better strength, hardness, stiffness, and lower densities. These next generation materials replace traditional monolithic materials in terms of strength, toughness, stiffness, and lower densities. The secondary phase is what distinguishes metal matrix composites from normal alloys. It occurs in alloys as a result of eutectic or eutectoid processes, whereas it forms in metal matrix composites as a result of matrix material addition. The use of MMCs was limited because to the intricacy of production procedures and the high cost of reinforcements.

Owing to the availability of a wide range of discontinuous reinforcements in recent years, it has gained attention in practically all disciplines, leading to the development of simple to manufacture and cheap cost efficient approaches. Substantial research is being conducted to create low-cost matrix materials such as aluminium and magnesium in place of high-cost matrix materials such as titanium, nickel steel, zinc, lead, copper, and so on. When comparing the various matrix materials, the aluminium matrix system is most favoured due to its many qualities such as low density, machinability, durability, low weight/high strength ratio, remarkable corrosion abrasion and wear resistance, and high thermal and electrical conductivity.

Friction stir processing is an advancement of friction stir welding, which was created to join metals in solid state using a tool. FSP is a new metalworking technology that can give targeted microstructure alteration and control in near-surface layers of produced metallic components. The FSP results in considerable microstructural refinement, densification, and homogeneity of the treated zone due to strong plastic deformation, material mixing, and heat exposure. The FSP approach has been used effectively to produce fine-grained structures and surface composites, change material microstructures, and synthesise composites and intermetallic compounds in situ.

The FSP is employed when the qualities of a metal desire to be increased by utilising additional metals to support and improve the first. This is an exciting process for the automotive and aerospace sectors, since new materials will be required to increase resistance to wear, creep, and fatigue. Aluminum alloys AA 2519, AA 5083, and AA 7075, as well as magnesium alloys AZ61, nickel-aluminium bronze, and 304L stainless steel, have all been successfully treated employing the friction stir technique. Mg and its alloy materials would also be included.

2. Review of status of Research and Development in the subject

2.1 International Status:

Using the suitable reinforcements and processing procedures, materials with unique property combinations such as improved hardness, strength, thermal and electrical conductivity, wear and corrosion resistance, and so on have been found. Moreover, it resists progressive oxidation by depositing a thin layer of aluminium oxide (Al_2O_3) on the metal surface, hence improving the corrosion resistance of aluminium alloys. [1].

The composite has a higher microhardness value due to the presence and pinning of reinforced particles. The addition of nanosized SiO_2 fillers to AZ61Mg alloy doubles its hardness and qualifies it for the manufacture of aviation components. [2]

According to [3], FSP-treated graphene/aluminum matrix composites have enhanced thermal conductivity and are excellent for lightweight heat exchangers. Moreover, spreading B_4C particles on AA7075 significantly boosts the composite's hardness and wear resistance. [4].

The microhardness of the AA5083 alloy reinforced with multi-walled carbon nanotubes and nanosized cerium oxide particles is substantially higher than that of the parent metal due to the inhibiting dislocation mechanism, dislocation pinning, and grain formation retardation. [5].

The addition of nanosized alumina particles on AA6082 alloy effectively raises the hardness value due to Orowan strengthening, grain strengthening, quench hardening, and work hardening. It is probably likely used in the aerospace and automotive industries. [6].

References:

1. Davis, JR. 1993, Aluminum and Aluminum Alloys, Asm International.
2. Lee, C, Huang, J & Hsieh, P 2006, Using Friction Stir Processing To Fabricate Mg Based Composites With Nano Fillers. Key Engineering Materials, 2006. Trans Tech Publ, pp. 69-76.
3. Jeon, C.-H, Jeong, Y.-H, Seo, J.-J, Tien, H. N, Hong, S.-T, Yum, Y.-J, Hur, S.-H & Lee, K.-J. 2014, Material Properties of Graphene/Aluminum Metal Matrix Composites Fabricated by Friction Stir Processing. International Journal of Precision Engineering And Manufacturing, vol. 15, pp. 1235-1239.
4. Kashani-Bozorg, S & Jazayeri, K. Formation of Al/B₄C Surface Nano-Composite Layers on 7075 Al Alloy Employing Friction Stir Processing. Aip Conference Proceedings, 2009. Aip, 715-719.

5. Hosseini, S, Ranjbar, K, Dehmlaei, R & Amirani, A 2015, 'Fabrication of Al5083 surface composites reinforced by CNTs and cerium oxide nano particles via friction stir processing', Journal of Alloys and Compounds, vol. 622, pp. 725-733
6. Shafiei-Zarghani, A, Kashani-Bozorg, S & Zarei-Hanzaki, A 2009, 'Microstructures and Mechanical Properties of Al/Al₂O₃ Surface Nano-Composite Layer Produced by Friction Stir Processing', Materials Science and Engineering: A, vol. 500, pp. 84-91.

2.2 National Status

In processing, several reinforcements such as B₄C, SiC, Al₂O₃, graphite, TiC, and WC are used, each having a distinct property. [7] AA6061 surface hybrid composites for aerospace applications were created using SiC and Al₂O₃ particles.

To blend ceramics or whiskers with a molten matrix, mechanical stirring is utilised. The produced material is then inserted into the die that will be utilised to make the component. This method is appropriate for producing composites with a reinforcing component of 30% by volume. [8].

FSP is a particle clustering and segregation processing approach that is an alternative to typical particle clustering and segregation procedures. It is an important method that changes the microstructure and characteristics of the composite material without melting the underlying substrate. [9].

[10] Kumar et al. examined the influence of TiC on the microstructural properties, hardness and corrosion behaviour of Al7075/TiC surface composites manufactured by friction stir processing. As reinforcement, the authors employed varying volume fractions of 3.5µm TiC particles and executed the FSP procedure at 30 mm/min travel speed and 1200 rpm rotating speed. The hardness and corrosion resistance of the surface composites were found to be higher when the TiC volume percent was increased compared to the base material.

Numerous studies on the hardness, wear, and friction properties of FSP treated surface composites made from 7075-T651 aluminium alloy reinforced with silicon carbide (SiC) were identified in the literature. [11]

References:

7. Aruri, D, Adepu, K, Adepu, K & Bazavada, K 2013, 'Wear and Mechanical Properties Of 6061-T6 Aluminum Alloy Surface Hybrid Composites [(SiC+ Gr) And (SiC+ Al₂O₃)] Fabricated By Friction Stir Processing', Journal of Materials Research And Technology, vol. 2, pp. 362-369

8. Sable, A & Deshmukh, S. 2012, Preparation of Mmcs by Stir Casting Method. International Journal of Mechanical Engineering & Technology, p. 3.
9. Mishra, RS & Ma, Z 2005, Friction Stir Welding and Processing. Materials Science and Engineering: R: Reports, vol. 50, pp. 1-78.
10. Kumar, S., Kumar, A. and Vanitha, C., 2019. Materials Today: Proceedings, 15, pp.21-29.
11. Ande, R., Gulati, P., Shukla, D.K. and Dhingra, H., 2019. Materials Today: Proceedings, 18, pp.4092-4101.

2.3 Importance of the proposed project in the context of current status

Mechanical characterization of Al7075/SiC surface composites was investigated in this study to give knowledge of manufacturing for SiC particles (SiCs) reinforced, mechanical behaviour, and an understanding of surface attributes like mechanical and tribological properties. Other than pure metals, research on Al7075/SiC surface composites will lead to possible industrial uses.

Attention should be paid to the homogenous dispersion method of SiCs in Al7075 matrix and effective bonding technique between the matrix and SiCs when producing the mass scale of Al7075/SiC composites.

Particular care should be taken to avoid SiCs damage during solid state processing. To better understand the strengthening mechanisms and achieve high performance, theoretical investigations of SiCs reinforced Al alloys, incorporating the interactions between processing parameters, micro and nano-structures, might be done. Before, various techniques were used to improve surface qualities, but they had a negative impact on the environment and health concerns due to the release of hazardous gases. Thus, among the numerous surface modification procedures, contemporary techniques such as friction stir processing have recently been applied to resolve those difficulties.

Al7075/SiC surface composites are widely employed in a variety of applications due to their characteristics such as low density, machinability, durability, low weight-high strength ratio, superior corrosion abrasion, and wear resistance.

2.4 If the project is location specific, basis for selection of location be highlighted:

N.A

3. Work Plan:

3.1 Methodology:

1. Selection of materials
2. Fabrication of Al7075-SiC surface composites
3. Mechanical characterization of Al7075-SiC surface composites

3.2 Time Schedule of activities giving milestones through BAR diagram.

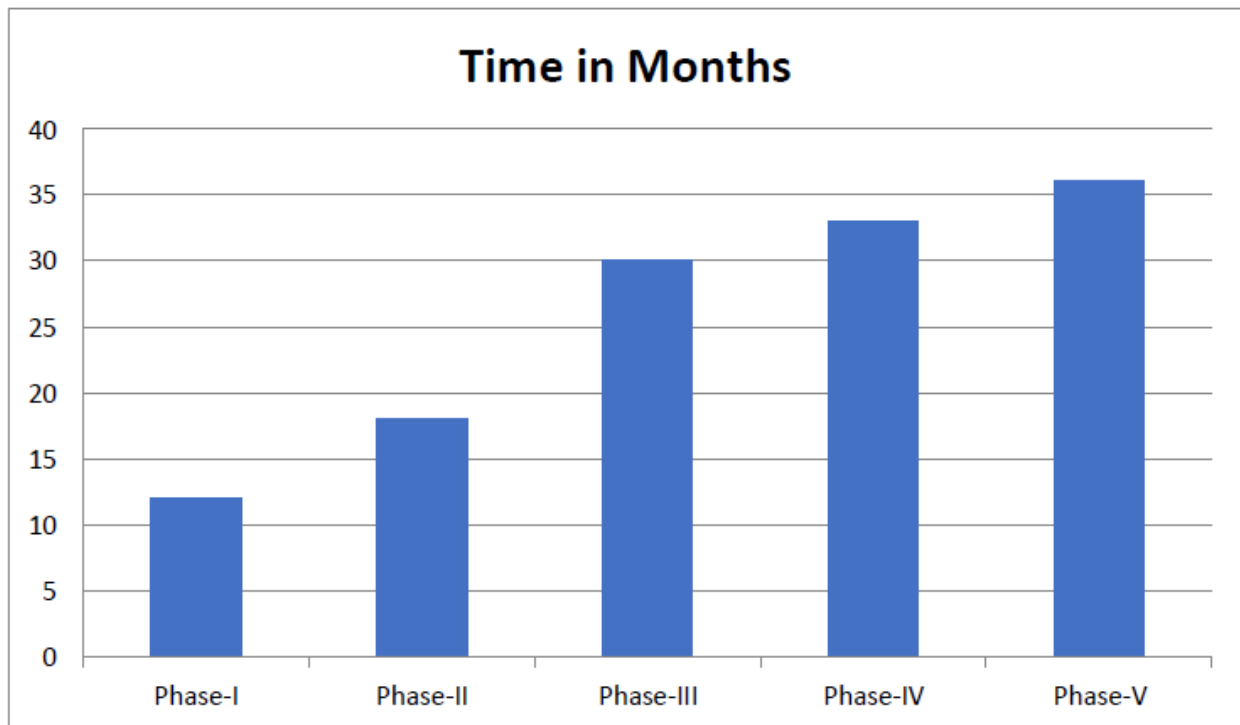
Phase 1: Purchase of equipment, Tools, base and reinforced materials.

Phase II: Fabrication of Al7075-SiC surface composites at various combinations of process parameters.

Phase III: checking for stability and properties.

Phase IV: Optimization of Friction stir processing (FSP) parameters for machining of fabricated composites to achieve maximum hardness value.

Phase V: Determining maximum microhardness value of surface composites.



3.3 Suggested Plan of action for utilization of research outcome expected from the project.

- Research outcome from the project will be published in international journals which will be accessed by industrialist as well as academicians.

- Patent may be filed on fabricated coated hybrid composites.
- Research outcomes will be discussed in international conferences wherein there is interaction of academicians and industrialist. This may help the industrialist to apply the techniques in their concerned areas.

3.4 Environmental impact assessment and risk analysis.

N.A.

4 Expertise:

4.1 Expertise available with the investigators in executing the project:

Dr. D.S.Chandramouli Assistant Professor in Mechanical Engineering with a proven Academic and Administration track record with over 11 years of experience. He is very much enthusiastic towards research activities. He has published 2 Free SCI, 1 free web of science, 1 free Scopus papers, 1 patent and around 4 reputed publication papers. Under his able guidance 15 projects have been completed in UG level, and 2 projects in PG level.

Dr. R.Umamaheswara Rao Professor & Principal in Mechanical Engineering with a proven Academic and Administration track record with over 20 years of experience. Working as Principal since 6 Years, UGC Coordinator and Worked as HOD over 12 Years. Published 37 publications in peer reviewed journals. Conducted Workshops, FDP, National and International Conferences. Handling MOU's from Eminent Organizations for training students and improves skills. My Doctorate Degree, my qualifications, my experience and my attitude further bolster the Institute.

4.2 Summary of roles/responsibilities for all Investigators:

S.No	Name of the Investigators	Roles/Responsibilities
1	Dr.D.S.Chandra Mouli	PI
2	Dr. R.Umaheswara Rao	Co-PI

4.3 Key publications published by the Investigators pertaining to the theme of the proposal during the last 5 years

Principal Investigator

1. D.S. Chandra Mouli, R.U.Rao (2022) " Influence of Post-heat Treatment on Friction Stir-Processed AA7075/SiC Surface Composite Properties" is published in Journal of Materials Engineering and Performance (Springer), ISSN: 1059-9495, Issue: 12, Volume 31, Dec 2022.- SCI Indexed
2. D.S. Chandra Mouli, R.U.Rao (2021) " Optimization of Friction Stir Process Parameters for Micro-Hardness and Wear Characteristics of Silicon Carbide-Reinforced Al-7075 Surface Composite" is published in Transaction of Indian institute of metals (Springer), ISSN: 0972-2815, Issue: 12, Volume 74, PP: 3135–3143, Dec 2021.- SCI Indexed
3. D.S. Chandra Mouli, A.T.V.Vara Prasad (2020) " Studies on friction stir welding of Aluminum plates 2014-T6 and 6061-T6" is published in Proteus Journal, ISSN: 0889-6348, Volume 11, Issue 6, PP:154-162, June 2020.- WEB OF SCIENCE GROUP INDEXED
4. D.S. Chandra Mouli, Dr.R.Umamaheswara Rao, D.L.Radha, S.Jushkumar (2020) "Resultant surface roughness of 5% and 10% Al7075-SiC MMCs by using FSP" is published in Journal of XI'AN University of Architecture & Technology (JXUJT), ISSN:1006-7930, Volume 12, Issue 3, PP:1287-1297, March 2020.- SCOPUS INDEXED
5. D.S. Chandra Mouli, Dr.R.Umamaheswara Rao, A.Sarath Kumar (2017) "A Review on Aluminium Based Metal Matrix Composites by Friction Stir Processing" is published in International Journal of Engineering and Manufacturing Science (IJEMS), ISSN: 2249-3115, Volume 7, Issue 2, PP:203-224, September 2017.
6. D.S. Chandra Mouli, Dr.R.Umamaheswara Rao, A.Sarath Kumar (2017) " Improvement of Hardness of Aluminium 7075 Metal Matrix Composite with Silicon Carbide powder by Friction Stir Processing" is published in International Journal of Engineering, Technology, Science and Research (IJETSR), ISSN:2394-3386, Volume 4, Issue 9, PP:432-439, September 2017.
7. Dr.D. Chaitanya kishore, A.Sarathkumar, D.S.Chandramouli (2017)"Minimization of Engine Emissions by Varying the Size of Piston Head" is published in International Journal of Advanced Research in Management, Engineering and Technology (IJARMET), ISSN: 2456 - 2998, Volume 2, Issue 1, pp. 356 - 363, January 2017.

8.

Co-Principal Investigator

1. D.S. Chandra Mouli, R.U.Rao (2022) "Influence of Post-heat Treatment on Friction Stir-Processed AA7075/SiC Surface Composite Properties" is published in Journal of Materials Engineering and Performance (Springer), ISSN: 1059-9495, Issue: 12, Volume 31, Dec 2022.- SCI Indexed
2. D. S. Chandra Mouli, R.Umamaheswara Rao, (2021) "Optimization of Friction Stir Process Parameters for Micro- Hardness and Wear Characteristics of Silicon Carbide-Reinforced Al-7075 Surface composite" , Trans Indian Inst Met, Springer (SCIE) <https://doi.org/10.1007/s12666-021-02394-4>. Impact factor 1.8
3. D.S.Ch.Mouli, Dr.R.Umamaheswararao, S.Jushkumar,(2020) "Resultant surface roughness of 5% and 10% Al7075SiC MMC by using Friction Stir Processing" Journal of Xi'an University of Architecture & Technology, Volume XII, Issue III, Page No: 1287-1296, Issn No : 1006-7930. (Scopus Indexed)
4. R.Umamaheswara Rao, B.Venkatanarayana, , K.N.S Suman,(2019) Enhancement of Mechanical Properties of PLA/PCL (80/20) Blend by Reinforcing with MMT Nanoclay, Materials Today: Proceedings, 18,85-97, Elsevier, Science direct (Scopus Indexed)
5. G.V.S.S.Sharma, R.UmamaheswaraRao, P.S.Rao (2016) " A Taguchi approach on Optimal process control parameters for HDPE pipe extrusion process" Journal of Industrial Engineering International, Volume 13, Issue 2, pp 215–228| Springer (Scopus Indexed).
6. B. Venkatanarayana, Ch. Ratnam, R. UmamaheswaraRao & K. PrasadaRao(2016) "Multi-response optimization of DI diesel engine performance parameters using Karanja methyl ester by applying Taguchi-based principal component analysis"., Biofuels, Volume8, issue1 PP:49-57, Taylor and Francis (Scopus Indexed).
7. A.K. Matta, R.U.Rao, K.N.S. Suman, V. Rambabu (2014) "Preparation and Characterization of Biodegradable PLA/PCL Polymeric Blends" Science Direct Procedia Materials Science, Elsevier, Vol: 6 PP:1260-1266 (Scopus Indexed).
8. D.S.Chandra Mouli, R.Umamaheswara Rao and A.Sarath Kumar(2017) " A Review on Aluminium Based Meatal Matrix Composites by Friction Stir Processing" International Journal of Engineering and Manufacturing Science, vol 7, Number 2, pp-203-224(Scopus Indexed)

4.4 Bibliography

Dr.D.S.Chandra mouli is working as Asst Professor in Department of Mechanical Engineering, Malla Reddy Engineering College, Secunderabad, India. He has done his Ph.D from JNTU University, Kakinada. he has published 8 papers in International journals and presented in 3 international and national conferences. Under his able guidance 14 projects have been completed in UG level, and 1 projects in PG level.

Dr. R.Umamaheswara Rao is working as Professor in department of Mechanical Engineering in Malla Reddy Engineering College, Secunderabad, India. He has done his Ph.D from Andhra University, Visakhapatnam. He has published 37 papers in International journals and presented in 10 international and national conferences. He has guided many B.Tech and M.Tech students in their projects.

5. List of Projects submitted/implemented by the Investigators

N.A

6. List of facilities being extended by parent institution(s) for the project implementation.

6.1 Infrastructural Facilities

S.No	Infrastructural Facility	Yes/No/ Not required Full or sharing basis
1.	Workshop Facility	Yes
2.	Water & Electricity	Yes
3.	Laboratory Space/ Furniture	Yes
4.	Power Generator	Yes
5.	AC Room or AC	Yes
6.	Telecommunication including e-mail & fax	Yes
7.	Transportation	Yes
8.	Administrative/ Secretarial support	Yes
9.	Information facilities like Internet/Library	Yes
10.	Computational facilities	Yes
11.	Animal/Glass House	Not Required
12.	Any other special facility being provided	-

6.2 Equipment available with the Institute/ Group/ Department/Other Institutes for the project

Equipment available with PI	Generic Name of Equipment	Model, Make & year of purchase	Remarks including accessories available and current usage of equipment

Department of Mechanical Engineering MallaReddy Engineering College (Autonomous)	Universal Testing Machine	UTM-20,05/08/2004	Currently used in Laboratory for UG, PG and Research works
	Hardness Testing Machine	RAB-250,05/08/2004	Currently used in Laboratory for UG, PG and Research works

7. Name and address of experts/ institution interested in the subject / outcome of the project.

Budget Details

Institution wise Budget Breakup :

Budget Head	Malla Reddy Engineering College	Total
Research Personnel	8,40,000	8,40,000
Consumables	3,00,000	3,00,000
Travel	90,000	90,000
Equipment	19,20,200	19,20,200
Contingencies	2,70,000	2,70,000
Overhead	75,000	75,000
Total	34,95,200	34,95,200

Institute Name : *Malla Reddy Engineering College*

Year Wise Budget Summary (Amount in INR) :

Budget Head	Year-1	Year-2	Year-3	Total
Research Personnel	2,80,000	2,80,000	2,80,000	8,40,000
Consumables	1,40,000	1,10,000	50,000	3,00,000
Travel	30,000	30,000	30,000	90,000
Equipments	19,20,200	0	0	19,20,200
Contingencies	1,15,000	1,10,000	45,000	2,70,000
Overhead	25,000	25,000	25,000	75,000
Grand Total	25,10,200	5,55,000	4,30,000	34,95,200

Research Personnel Budget Detail (Amount in INR) :

Designation	Year-1	Year-2	Year-3	Total
Junior Research Fellow <i>for conducting experimental tests and analysis</i>	2,80,000	2,80,000	2,80,000	8,40,000

Consumable Budget Detail (Amount in INR) :

Justification	Year-1	Year-2	Year-3	Total
<i>Al7075 material, SiC powder, Tools etc</i>	1,40,000	1,10,000	50,000	3,00,000

Travel Budget Detail (Amount in INR) :

Justification (Inland Travel)	Year-1	Year-2	Year-3	Total
<i>For conducting tests, analysis, attending conferences and workshops etc</i>	30,000	30,000	30,000	90,000

Equipment Budget Detail (Amount in INR) :

Generic Name ,Model No. , (Make)/ Justification	Quantity	Spare time	Estimated Cost
RV Machine Tools <i>FSWB 10-400 NC (Friction stir welding)</i> <i>Easy to Operate Single person can handle the entire processing. Adjustable Speed controls are provided for Stirring and Secure Exposure to the operator and over load protection.</i>	1	40 %	19,20,200

Contingency Budget Detail (Amount in INR) :

Justification	Year-1	Year-2	Year-3	Total
<i>Printing, testing and analysis etc.,</i>	1,15,000	1,10,000	45,000	2,70,000

Overhead Budget Detail (Amount in INR) :

Justification	Year-1	Year-2	Year-3	Total
<i>Power, generator, water, and miscellaneous etc.,</i>	25,000	25,000	25,000	75,000

PROFORMA FOR BIO-DATA (to be uploaded)

1. Name and full correspondence address:
Dr.D.S.Chandra mouli
Asst Professor, Department of mechanical engineering,
Mallareddy engineering college(A),Maisammaguda, kompally,
Medchal malkajgiri, Hyderabad, Telangana-500100
2. Email(s) and contact number(s): dkmouli1986@gmail.com, moulidk@mrec.ac.in
9491518360
3. Institution: Mallareddy engineering college(A)
4. Date of Birth: 01/08/1988
5. Gender (M/F/T): Male
6. Category Gen/SC/ST/OBC: OBC
7. Whether differently abled (Yes/No): No

8. Academic Qualification (Undergraduate Onwards)

	Degree	Year	Subject	University/Institution	% of marks
1.	Ph.D	2023	Manufacturing	JNTUK	62.50
2.	M.Tech	2012	Adv Manufacturing Systems	JNTUK	73.71
3.	B.Tech	2009	Mechanical Engineering	JNTUK	66.17

9. Ph.D thesis title, Guide's Name, Institute/Organization/University, Year of Award.

10. Work experience (in chronological order).

S.No.	Positions held	Name of the Institute	From	To	Pay Scale
1	Assistant Professor	Malla Reddy Engineering College(A)	10-06-2016	Till Date	41,500/-
2	Assistant Professor	Nalla Malla Reddy Engineering College	23/06/2014	09/06/2016	26,520/-
3	Assistant Professor	KBR Engineering college	02/06/2012	31/05/2014	22,000/-

11. Professional Recognition/ Award/ Prize/ Certificate, Fellowship received by the applicant.

S.No	Name of Award	Awarding Agency	Year

12. Publications (List of papers published in SCI Journals, in year wise descending order).

S.No.	Author(s)	Title	Name of Journal	Volume	Page	Year
1	D.S. Chandra Mouli, R.U.Rao	Influence of Post-heat Treatment on Friction Stir-Processed AA7075/SiC Surface Composite Properties	Journal of Materials Engineering and Performance (Springer)	Volume 31		2022
2	D.S. Chandra Mouli, R.U.Rao	Optimization of Friction Stir Process Parameters for Micro-Hardness and Wear Characteristics of Silicon Carbide Reinforced Al-7075 Surface Composite	Transaction of Indian institute of metals (Springer)	Volume 74	3135–3143	2021

13. Detail of patents.

S.No	Patent Title	Name of Applicant(s)	Patent No.	Award Date	Agency/Country	Status

14. Books/Reports/Chapters/General articles etc.

S.No	Title	Author's Name	Publisher	Year of Publication

15. Any other Information (maximum 500 words)

CURRICULUM VITAE

Dr.R.Umamaheswara Rao

Email:

umr2013rayavarapu@gmail.com Cell :

9703309675

OBJECTIVE

To associate with a growing Organization that provides an opportunity to grow along with the organization by enhancing Teaching, Administration and Research skills with competitive work environment.

TECHNICAL SKILLS

- Programming languages : C
- Operating Systems & Office Tools: Win 9 & Ms-Office.

EDUCATIONAL QUALIFICATIONS

- **PhD** – awarded in the Dept. of Mechanical Engg, **A.U. – July2013.**
- **M. E.** –Mechanical Eng. with specialization in **I.E.** from **A.U. –Sept.2002**
with **First Class.**
- **B.E.** - Mechanical Eng. from S.R. K.R College of Engg. **A.U. –June1999**
with **First Class.**

INDUSTRIAL EXPERIENCE

ONE YEAR

Worked as Maintenance & Mechanical Supervisor in Surana cables Ltd., Hyderabad, during the period **July. 1999 to June.2000**

PROFESSIONAL EXPERIENCE

TOTAL: ABOUT 20 YEARS

- Working as **Professor and principal** with MITS, Kodad, since July 2021 to till date
- Worked as **Professor and Principal** with Chaitanya Engineering College, Kommadi, Visakhapatnam since July 2019 to JAN 2021
- Worked as **Professor and Principal** with Indira Institute of Technology and Science, Markapuram since June 2018 to July 2019.
- Worked as a **Professor (ratified by JNTUK on March 2017)** and **Head of the Mechanical Engineering Department** at Sasi Institute of Technology and Engineering, Tadepalligudam since Dec 2016 to May 2018.
- Worked as **Professor and Principal (ratified by JNTUH)** with Sri Sai Educational Society's Group of Institutions, Kodad since May 2016 to Dec 2016
- Worked as an **Asso. Professor (ratified by JNTUK on May 2010)** in the Dept. of Mechanical Engg. at "GMR Institute of Technology" Rajam, Srikakulam dist, since Aug. 2008 to May 2016
- Worked as an **Asst. Professor (ratified by JNTUH on Oct 2003)** in the Dept. of Mechanical

Eng. at “GMR Institute of Technology” Rajam, Srikakulam dist, during the period Nov.2002 to Aug. 2008.

No. of Subjects taught and Projects Guided at UG, PG & PhD Level

UG Level: No. of Subjects taught: 9
No. of Projects Guided:16

PGLevel: No. of Subjects taught: 3
No. Projects Guided :4

PhD Level: No. of Research
Scholars:1(under Supervision)
2 (Extended support)

Areas of Interest and Subjects taught

Engineering Optimization, Industrial Engineering and Management, Operations Management, Operations Research, Entrepreneurship, Total Quality Management, Design of Experiments, Material Science and Metallurgy, Polymer blends & Nano composites, Engineering Mechanics , Strength of materials, and Engineering Drawing

List of Publications (National&International)

TOTAL: 37

Journal Publications:

SCI(1) / Scopus Indexed (8):

1. D. S. Chandra Mouli, **R.Umamaheswara Rao**, (2021) “Optimization of Friction Stir Process Parameters for Micro- Hardness and Wear Characteristics of Silicon Carbide-Reinforced Al-7075 Surface composite” ,Trans Indian Inst Met, **Springer (SCIE)**<https://doi.org/10.1007/s12666-021-02394-4>. Impact factor 1.8
2. D.S.Ch.Mouli, **Dr.R.Umamaheswararao**, S.Jushkumar,(2020) “Resultant surface roughness of 5% and 10% Al7075SiC MMC by using Friction Stir Processing” Journal of Xi'an University of Architecture & Technology,Volume XII, Issue III,Page No: 1287-1296, Issn No : 1006-7930.(**Scopus Indexed**)
3. **R.Umamaheswara Rao**,B.Venkatanarayana, ,K.N.S Suman,(2019) Enhancement of Mechanical Properties of PLA/PCL (80/20) Blend by Reinforcing with MMT Nanoclay, Materials Today: Proceedings, 18,85-97, **Elsevier, Science direct (Scopus Indexed)**
4. G.V.S.S.Sharma, **R.UmamaheswaraRao**, P.S.Rao (2016) “ A Taguchi approach on Optimal process control parameters for HDPE pipe extrusion process” Journal of Industrial Engineering International,Volume 13, Issue 2, pp 215–228|**Springer(Scopus Indexed)**.
5. B. Venkatanarayana, Ch. Ratnam, **R. UmamaheswaraRao** &K. PrasadaRao(2016) “Multi-response optimization of DI diesel engine performance parameters using Karanja methyl ester by applying Taguchi-based principal component analysis”., Biofuels,Volume8, issue1 PP:49-57,**Taylor and Francis (ScopusIndexed)**.
6. A.K. Matta, **R.U.Rao**, K.N.S. Suman, V. Rambabu (2014) “Preparation and Characterization of Biodegradable PLA/PCL Polymeric Blends” Science Direct Procedia Materials Science, **Elsevier**, Vol: 6 PP:1260-1266 (**ScopusIndexed**).
7. D.S.Chandra Mouli, **R.Umamaheswara Rao** and A.Sarath Kumar(2017) “ A Review on Aluminium Based Meatal Matrix Composites by Friction Stir Processing” International Journal of Engineering and Manufacturing Science,vol 7,Number 2, pp-203-224(**Scopus Indexed**)
8. **R.UmamaheswraRao**, G.Babji and T.Venkateswararao (2015) “Preparation and Characterization of Non Asbestos Brake Pads”, International Journal of Applied Engineering Research, Volume 10, Number 15, pp. 35945-35947 (**ScopusIndexed**).

Non SCI/Scopus Indexed (18):

9. B.Venkatanarayana, Ch. Ratnam, R. Umamaheswara Rao & K. PrasadaRao,(2018) An Artificial Neural Network and Taguchi Integrated Approach to the Optimization of Performance and Emissions of Direct Injection Diesel Engine, *European Journal of Sustainable Development Research*, 2(2), 16. (UGC approved)
10. J.Madhu Kiran, TVRao,TVS Siva and **R.UmaheswaraRao(2017)** “ Performance Test on Flat fin automotive radiator using nano fluids” *International Journal of Chem Tech Research*, Vol.10 No.13 PP 153-160 ISSN (Online):2455-9555(UGC approved)
11. Madhukiran,J.T.venkateswararao. S. Madhusudan, R.Umaheswara Rao (2017) “Evaluation of the mechanical properties on Sisal-Coir Hybrid Natural FiberComposites” *International Journal of Engineering Research and Development*, Volume 13, Issue 9, pp 12-49 (UGC approved)
12. D.S. Chandra Mouli, A.Sarath Kumar and **R.Umaheswara Rao(2017)** “Improvement of Hardness of Aluminium 7075 Metal Matrix Composite with Silicon Carbide Powder by Friction Stir Processing”, *International Journal of Engineering Technology Science and Research*, Vol.4,issue9 (UGCApproved).
13. **R.Umaheswara Rao, G Babji (2015)** “A Review paper on alternate materials for Asbestos brake pads and its characterization” *International Research Journal of Engineering and Technology*, , Vol: 2 issue: 2, e-ISSN: 2395-0056
14. D.Venkata Rao, K.Prasada Rao, S.Chiranjeeva Rao and **R.Umaheswara Rao (Aug:2014)** “Design and Fabrication of Power generation System using Speed Breaker” *International Journal of Current Engineering and Technology*, E-ISSN 2277 – 4106, P-ISSN 2347 – 5161, Vol.4, No.4 pp.2697-2702
15. K.Prasada Rao, G.Anuradha, M.Anil Kumar, **R.Umaheswara Rao (Aug-Sep:2013)** “The Six Sigma Approach to reduce Specific Roll Consumption in Medium Merchant and Structural Mill” **International Journal** of Research in Engineering Science and Advanced Technology(IJREST), Volume-2, Issue-1, PP:120-129,ISSN:2250-3676
16. **R.Umaheswarrao, T.VenkataSylaja, Dr K N S Suman (July-Aug 2013)** “Improvement of Toughness and Stiffness of Biopolymer Blends Using PCA based TAGUCHI Approach” **International Journal** of Mechanical Engineering & Technology (IJMET), Volume 4, Issue 4, ISSN Online: ISSN 0976 – 6359, [JIF: 5.7731(GISI)]
17. K.Prasada Rao, **R.Umaheswara Rao, S.Ravi Babua and Dr.V.Rambabu (Sept 2013)** “Optimization of Performance Parameters of a Diesel Engine fuelled with Biofuels” **International Journal** of Thermal Technologies, Vol.3, No.3 and PP: 85-91, ISSN 2277 – 4114 (GIF:1.752)
18. A.K Matta, D.Venkata Rao, P.RameshBabu and **R. Umamaheswara Rao(2012)** “Analysis of Gas Turbine blades with materials N155 and INCONEL 718” **International Journal** of Advances in Science and Technology, Vol.4, No.1.ISSN2229-5216
19. M.Santhi kumar, **R.Umaheswara Rao** and S.Santhosh kumar(2012) “Failure Analysis Of Journal Bearing During Start Up” *IRACST – Engineering Science and Technology: An International Journal (ESTIJ)*, ISSN: 2250-3498, Vol.2, No. 4, August 2012(IF:0.225)
20. A.K.Matta ,V.Purushottam, **R.Umaheswara Rao, Dr.C.L.V.R.S.V.Prasad (2012)** “Construction of a Test Bench for bike rim and Brake Rotor” *IOSR Journal of engineering (IOSRJEN)* ISSN: 2250-3021 Volume 2, Issue 8, August 2012, PP 40-44, IF:1.645(AQCJ)
21. **R.Umaheswara Rao, S.Santhosh Kumar and M.Santhi Kumar(2012)** “Preparation And Characterization Of Polymer Nanocomposites For better Damping” **International Journal** of Engineering research and Applications (IJERA) ISSN: 2248-9622 Vol. 2, Issue4, July-

22. A.K. Matta, R.B. Pothula and **R.U. Rao (2012)** “Design and Analysis of Steam Turbine Blades using FEM” **International Journal** of Mechanical Engineering and Research. ISSN 2249-0019, Volume 2, Number 2 , pp.67-73
23. G Bhanukiran, KNS Suman, N. Mohan Rao and **R.Umamaheswara Rao (2011)**, A study on the influence of hot press forming process parameters on mechanical properties of green composites using Taguchi experimental design, **International Journal** of Engineering, Science and Technology, Vol.3, No.4, PP. 253-263 , (**Citations:2**)
24. **R.Umaheswara Rao**, A.Madhavi, KNS Suman, and G Bhanukirn(**2011**), Elimination of Multi- Response correlation while applying Taguchi Philosophy in optimization of process parameters for preparation of PLA and PCL biopolymer blends through compression molding, **International journal** of Industrial Engineering technology, Vol.3, No.4, PP. 351-368 , ISSN 0974 -3146
25. **R.Umaheswara Rao**, KNS Suman, VVS Kesava Rao, and G Bhanukirn(**2011**), Toughening of Polylactide by melt blending with a biodegradable polycaprolactone, **International journal** of Advanced Materials science, Vol. 2, No.2, PP.241-248, ISSN 2231-1211
26. **R.Umaheswara Rao**, KNS Suman , VVS Kesava Rao, and G Bhanukirn(**2011**), Study of rheological and mechanical properties of biodegradable polylactide and polycaprolactone blends, **International Journal** of Engineering Science and Technology, Vol.3, No.8, PP.6259-6265, e-ISSN:0975-5467 (**Citations:2** and ICvalue:3.14)
27. **R.Umaheswara Rao**, Dr. KNS Suman , Dr. VVS Kesava Rao, Dr. B Satyanarayana and G Bhanukirn(**2011**), Selection of optimal process parameters for preparation of PLA and PCL Bio- Polymer blends through compression molding, **International journal** of Automotive Mechanical and Aerospace Engineering Research, Vol.2, No.2, PP.272-281

Conference presentations:

International (4):

1. A.K. Matta, **R.U.M.Rao** and Dr. V Rambabu (**2013**) “Preparation and Characterization of Ternary Blends composed of Polylactide, Poly caprolactone and MWCNT” Proceedings of the International conference on engineering materials and processes (ICEMAP-2013) 23rd, 24th May 2013 , Mechanical Engg. Dept., Tagore Engineering College, Rathinamangalam, Chennai.
2. Mrs.P.Beulah, Mr. S. Santosh Kumar and **R. Umamaheswara Rao (2013)** “Preparation And Characterization Of Clay-Polymer Nanocomposites For better damping properties” Proceedings of the International conference on engineering materials and processes (ICEMAP-2013) 23rd, 24th May 2013 , Mechanical Engg. Dept., Tagore Engineering College, Rathinamangalam, Chennai.
3. **R.Umaheswara Rao** and P. Ramesh Babu (**2012**) “Optimization of Process parameters of compression molding and PLA/PCL blend composition using PCA based Taguchi approach” Proceedings of 1st International Conference on “Emerging Trends In Manufacturing Technology” (In association with AeSI, Kochi Branch and IPE), Toc H Institute of science and Technology, Arakkunnam, Ernakulam-682313, 5th& 6th September 2012
4. **R.Umaheswara Rao**, P. Ramesh Babu and Dr. K.V.Viswa Mohan (**2007**), Optimal Control Parameters Selection of HDPE Pipe Extrusion for improving withstanding pressure, Proceedings of the **International** conference ADM-2007, Sethu Institute of Technology, Kariapatti, TN, India, 9-11 August 2007, PP.7

National(6):

5. S.Ravi Babu, P.Beulah and **R.Umamaheswara Rao (2013)** , Enhancement of Heat Transfer using nano fluids A Review, Souvenir of National Conference for Researchers on “Latest Innovations in Mechanical Engineering” (LIME-2013) (Supported by TEQIP-II) , Andhra University, Visakhapatnam, A.P , India , 28April,2013
6. Nag kiran.P, **R.Umamaheswara Rao** and S.Srikiran(2007), Obstacle Avoidance of Autonomous Vehicle using stereo Vision system, Proceedings of the National conference “Factory Automation, Robotics and Soft Computing”, National Institute of Technology, Warangal, A.P, India, 18-19 JAN 2007,PP.139-142
7. **R.Umamaheswara Rao**, P. Ramesh Babu and Dr. K.V.Viswa Mohan (2007), Optimal Path Selection for Pick and Place Application of SCARA Robot by using GA- Case studies, Souvenir of All India Seminar/ conference “ Emerging Trends in Mechatronics and Instrumentation ”, Sri venkteswara University , A.P, India, 29 -30 June2007.
8. **R.UmamaheswaraRao**,Dr.K.V.ViswaMohanandP.SrinivasaRao(2006) ,Experimental Design through Taguchi Technique to Improve the Quality of RingCasting, Proceedings of National conference “AAQMENT – 2006”, Erode Sengunthar Engineering College, Erode, TN, India, 23 – 24 February 2006,PP.7
9. **R.Umamaheswara Rao**, P.RameshBabu(2006), “Investigation of Optimum Machining Parameters for Turning through Taguchi approach” Proceedings of National conference “Emerging Technologies in Mechanical Engineering for sustainable development”, S.R.K.R. Engineering College, Bhimavaram, A.P, India, 22 -23 Dec 2006
10. **R.Umamaheswara Rao** and VVS Kesava Rao(2004), “Genetic Algorithm Based Forecasting System, Proceedings of National Seminar “ Design Optimization and Condition monitoring” , Department of Mechanical Engineering (UGC Sponsored), Andhra University, A.P, India, 26- 27 August 2004,PP.5-9

Text Books / Research Books published (1):

- Single Objective Optimization of Performance and Emissions of Di Diesel Engine, Dr. Beeravelli Venkatanarayana, Dr. Chanamala Ratanam, Dr. Rayavarapu Umamaheswararao, ISBN: 9781794714250, Published in [lulu.com](https://www.lulu.com) on 31-10-2019.
<https://www.lulu.com/en/ca/shop/dr-rayavarapu-umamaheswararao-and-dr-chanamala-ratanam-and-drbeeravelli-venkatanarayana/single-objective-optimization-of-performance-and-emissions-of-di-diesel-engine/ebook/product-1mmkdp4g.html>

Citations: 245 (<https://scholar.google.co.in/citations?user=KrtCEF8AAAAJ&hl=en>)

List of Manuscripts reviewed (National& International)

TOTAL:4

1. Reviewed article (Jan 2018) "Effect Of Total Deflection On Failure Pressure Of Bend Pipe With Attach Pipe In Water Distribution System" submitted to the International Journal of Environment and Sustainable Development (IJESD)byInderscience
2. Reviewed manuscript (Oct 2017) entitled “Development Of Brake Friction Composites Containing P J Fiber –An Eco-Friendly Approach” for the Journal of Composite Materials bySAGE
3. Reviewed a paper (April 2017) entitled "Investigation of Boiler Scale Deposits as Heterogeneous Base Catalyst for Biodiesel Production from Jatropha Oil" for the journal of Biofuels.
4. Reviewed a paper (June 2016) entitled "Jatropha Curcas (L.), Seed Yields as Impacted by

Pruning Intensity and Intercropping" for the journal of Biofuels.

Sponsored Research Project / Workshop proposals submitted for approval:

- Project Proposal (as-PI) entitled “Fabrication and Characterization of Brake Pad Using Synthetic Mineral Fibers” was submitted to the Department of Science & Technology (SERB) under EMR scheme on **Aug,2017**.
- Project Proposal (as-PI) entitled “Preparation and characterization of ecofriendly brake pad material made up of rock wool fibers and epoxy resins” was submitted to the Department of Science & Technology (SERB) under Start Up Research Grant (Young Scientists) on **28th July,2015**.
- A workshop proposal titled “Advances in Nanomaterials: Processing, Characterization and Applications’ was submitted to DST on **23 July2015**.
- Project Proposal (as Co-PI) entitled “ Fabrication, Characterization and Reliability Analysis of Flax Reinforced Bio-Degradable polymers” was screened for defense, under Technology Systems Development Programme, Department of Science & Technology on **6th May2011**

Memberships in Professional societies/ Institutions:

- Life Member Indian Society for technical Education

Details of summer/ winter schools attended

1. Participated in the Faculty development program on “Fault Diagnosis, Condition Monitoring and Structural Dynamic Analysis” during 6th to 19th November 2017 Sponsored by AICTE organized by AITAM, Srikakulam.
2. Participated in a Two Day National Workshop on “Challenges and Latest Trends in Nanocomposites” (CLTNC-2014) organized by Centre for Nanotechnology AUCE(A), AU, VSP September 4th & 5th, 2014
3. Attended A leadership retreat Program on “Discover Yourself” resourced by International Coach Federation (ICF) during 28th and 29th April 2014 at Sun Ray Village Resorts, Bhogapuram
4. Attended A Two-Day National Workshop on “Applications of Nano-materials for Sustainability” at Dept of Mechanical Engineering., GMR Institute of Technology, Rajam, A.P, India, on 22nd – 23rd March, 2014
5. Attended A Two-Day National Workshop on “ Product Design and Development” at Dept of Industrial Engg., GITAM Institute of Technology, GITAM UNIVERSITY, VSP, A.P, India, on 21st and 22nd February, 2014.
6. Participated in a “Mission 10X Learning Approach Practitioners Certificate” by WIPRO at AITAM, tekkali, A.P, India, from 8th Feb to 9th Feb, 2010.
7. Participated in a Mission 10X workshop conducted by WIPRO at GMR Institute of Technology, Rajam, A.P, India, from 8th December to 12th December 2008
8. Attended Two day Workshop on “GMR Values and Beliefs” at GMRIT, Rajam, A.P, India, during 9th and 10th July, 2007.
9. Attended A Two-Day National Workshop on “ Computational Methods in Engineering” at Dept of Mech Engg., GMRIT, Rajam, A.P, India, on 7th and 8th October, 2006
10. Attended Two day National Workshop on “Genetic Algorithms and Applications-GALAP-2006” at JNTU, KKD, A.P, India, during 27th and 28th July, 2006.
11. Attended Three weeks Refresher Course on “Advanced Optimization Techniques for Engineering Systems” from 29th May to 17th June, 2006 at JNTU, Hyderabad, A.P, India
12. Participated in One day National Workshop on “Applications of Optimization Techniques in Industrial Engineering – OPTECH – 05” at KLCOE, Vijay Wada, A.P, India, on 10th,

Dec,2005.

13. Participated in Three Day National Workshop on “Design and Production aspects in Mechanical Engineering” from 08-11-2004 to 10-11-2004 at MVGR College of Engineering, Vizianagaram, A.P,India
14. Attended a one week QIP on “Methods of Improving Teaching Techniques” conducted by TTTI Chennai, Government of India at GMRIT, Rajam, A.P, India, during 24-29 November,2003.

INVITED TALKS:

- **Resource Person** for a technical talk on “Energy Management” in a one day Guest Lecture for M.Tech (Thermal Eng.) II Sem Students organized by Sanketika Institute of Technology and Management (SITAM), Pothinamallyapalem, Visakhapatnam, A.P. on 23rd Aug2014
- **Resource person** for a technical talk on “Preparation and characterization of biopolymer nanocomposites” in a Two-day National Workshop on ‘Applications of Nano-materials for Sustainability’ in Dept of Mechanical Engineering., GMR Institute of Technology, Rajam,A.P, India on 22nd – 23rd March,2014
- **Resource person** for a managerial skills training programme on “Productivity improvement techniques, PPC, OR and HRM” organized by GMRIT, in association with WDM, VSP during March and April2013
- **Resource person** for a technical talk on “Five S frame work, KAIZEN and ISO 9000-14001 ” in Business skills development programme organized by EDC, GMRIT, in association with **MSME development Institute**(Br.) VSP on 14th Dec2011
- **Resource person** for a technical talk on “ TQM and Six Sigma” in Business skills development programme organized by EDC, GMRIT, in association with **MSME development Institute**(Br.) VSP on 22 Dec2010

ACHIEVEMENTS:

- Mission 10X Certificate in Teaching and Learning is Awarded by WIPRO “ In Pursuit of Excellence in Engineering Education through Innovation” on November 25,2010

WORKSHOPS/ CONFERENCES ORGANIZED:

1. Organized One Week Faculty Development Program on “Advances in Manufacturing of Composites (AMC-2017), 27th November – 2nd December 2017, in the Dept. of Mechanical Engineering, Sasi Institute of Technology and Engineering, TPG, A.P,India.
2. Organized A Two day National Workshop on “Advances in Nanomaterials: Processing, Characterization and Applications’, in the Dept. of Mechanical Engineering., GMR Institute of Technology, Rajam,A.P, India, on 22nd – 23rd , Aug,2015.
3. Organized A Two-day National Workshop on ‘Applications of Nano-materials for Sustainability’ in the Dept. of Mechanical Engineering., GMR Institute of Technology, Rajam, A.P, India, on 22nd – 23rd March,2014.
4. Organized A Two-day National Workshop on ‘Recent Technologies in Renewable Energy systems’ in the Dept. of Mechanical Engineering., GMR Institute of Technology, Rajam, A.P, India, on 13th – 14th April,2013.
5. Conducted SWOT analysis of GMRIT as part of TEQIP in2010.

ACADAMIC AND ADMINISTRATIVE ACTIVITIES UNDER TAKEN:

1. Principal, Chaitanya Engineering College, vizag since July 2019 to JAN 2021
2. Principal, Indira Institute of Technology, Markapur since June 2018 to July2019
3. Head of the Mechanical Engineering Department since dec2016 at Sasi Institute of Technology and Engineering, TPG and led the department for upgrading the Institute to autonomous level during AY:2016-17.
4. Principal at Sri Sai Educational Society group of Institutions , Kodada since May2016 to Dec2016
5. Paper setter for various subjects at UG and PG level to Autonomous Colleges such asGIET and SRKREC, during AY:2016-17.
6. Acted as an External Examiner for M Tech VIVA-VOCE, December 2017, UshaRama College of Engg. and Technology, Telaprolu, NearGannavaram
7. Conducted Mock-Interviews for final B.Tech students as per TPO guidelines on4thsept.2014
8. QAC member of Department of Mechanical Engg. During Academic Years:2011-2013.
9. NBA/ISO Coordinator of Department of Mechanical Engg. during Academic Years:2011-2013
10. Member of ConsultancyWing
11. Coordinated Autonomous activities at department level as QAC member during June-Dec 2011 for getting Autonomous for theInstitute
12. AMC member for Mech II-II-A(AY:2011-12)
13. Coordinated Online internal examinations at department level for ThreeYears
14. Coordinated ISTE activities at Department level as ISTE faculty coordinator for 3 years
15. Coordinated paper presentation and poster presentation contest ofSTEPCONE-09
16. Coordinated Time Tables at Department level for ThreeYears
17. Coordinated Internal Examinations at Department level for ThreeYears
18. In charge of Workshop lab as a part of that revised lab manual of Workshop in2007
19. Department level tutorial and term papercoordinator

PERSONAL DETAILS

DateofBirth	: 1 st June1976
Nationality	:Indian
MaritalStatus	:Married
Address	: Flat No:302, Vinayaka vihar, Pradeep Nagar, Vizianagaram-535004
Phone(alternative)	:9912935964

DECLARATION

I hereby, declare that the information provided is genuine and promise that I will submit the documents for proof ondemand.

Date: 16-10-2021

Place: Vizag

(Dr.R.Umamaheswara Rao)



Malla Reddy Engineering College



(An UGC Autonomous Institution approved by AICTE and affiliated to JNTU Hyderabad,
Accredited by NAAC with 'A++' Grade (III - cycle)

NBA Accredited Programmes - UG (CE, EEE, ME, ECE & CSE) PG (CE - Structural Engg., EEE-Electrical Power Systems, ME - Thermal Engg.).

Endorsement from the Head of the Institution of PI

This is to certify that:

1. Institute welcomes participation of Name: **Dr. D.S.ChandraMouli** Designation: **Assistant Professor** as the Principal Investigator and **Dr. R. Umamaheswara Rao** as the Co- Investigator/s for the project titled: **Experimental investigation on Al7075/SiC fabrication by Friction stir processing** and that in the unforeseen event of discontinuance by the Principal Investigator, the Co-Investigator will assume the responsibility of the fruitful completion of the project with the approval of SERB.
2. The PI **Dr. D.S.ChandraMouli** is a permanent or regular employee of this Institute/University/Organization and has **25 years 5 months** of regular service left before superannuation.
3. The project starts from the date on which the University/Institute/ Organization/College receives the grant from SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
4. The investigator will be governed by the rules and regulations of University/ Institute/Organization/College and will be under administrative control of the University/ Institute/Organization/College for the duration of the project.
5. The grant-in-aid by the SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi will be used to meet the expenditure on the project and for the period for which the project has been sanctioned as mentioned in the sanction order.
6. No administrative or other liability will be attached to SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi at the end of the project.
7. The University/Institute/Organization/College will provide basic infrastructure and other required facilities to the investigator for undertaking the research project.
8. The University/ Institute/Organization/College will take into its books all assets created in the above project and its disposal would be at the discretion of SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
9. The University/ Institute/Organization/College assumes to undertake the financial and other management responsibilities of the project.

Seal of

University/ Institute/Organization/College

Date:

11/03/23



Signature

Registrar of University/ Head of the Institute/
Head of Malla Reddy Engineering College
Malla Reddy Engineering College
Malsammaguda, Dhulapally,
(Post Via Kompally), Sec'bad-500100.



MADHIRA INSTITUTE OF TECHNOLOGY & SCIENCES

Paleannaram (V), Chilukur (M), KODAD, Suryapet (Dt) - 508 238, Telangana State.

(Approved by AICTE, New Delhi & Affiliated to SBTET, Hyd.)

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Ref :

Date : 13/03/2023

Endorsement from the Head of the Institution of Co-PI

This is to certify that:

1. Institute welcomes participation of Name: **Dr. D.S.ChandraMouli**, Designation: **Assistant Professor** as the Principal Investigator and **Dr. R.Umamaheswara Rao** as the Co- Investigator/s for the project titled: **Experimental investigation on Al7075/SiC fabrication by Friction stir processing** and that in the unforeseen event of discontinuance by the Principal Investigator, the Co-Investigator will assume the responsibility of the fruitful completion of the project with the approval of SERB.
2. The Co-PI, **Dr. R.Umamaheswara Rao** is a permanent or regular employee of this Institute/University/Organization and has **20 years, 3 months** years of regular service left before superannuation
3. The Co-PI will be governed by the rules and regulations of University/ Institute/Organization/College and will be under administrative control of the University/ Institute/Organization/College for the duration of the project.
4. The grant-in-aid by the SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi will be used to meet the expenditure on the project and for the period for which the project has been sanctioned as mentioned in the sanction order.
5. No administrative or other liability will be attached to SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi at the end of the project.
6. The University/Institute/Organization/College will provide basic infrastructure and other required facilities to the investigator for undertaking the research project.
7. The University/ Institute/Organization/College will take into its books all assets created in the above project and its disposal would be at the discretion of SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
8. The University/ Institute/Organization/College assumes to undertake the financial and other management responsibilities of the project.

Seal of

University/ Institute/Organization/College

Date: 13/03/2023

PRINCIPAL
Madhira Institute of Technology & Sciences
Paleannaram (V), Chilukuru (M)
KODAD, Suryapet Dt.-508 238, T S



Signature

PRINCIPAL
Registrar of University/Head of the Institute/
Paleannaram (V), Chilukuru (M),
KODAD, Suryapet Dt.-508 238, T S

Undertaking by the Principal Investigator

To

The Secretary
SERB, New Delhi

Sir

I **Dr. D.S.ChandraMouli** here by certify that the research proposal titled **Experimental investigation on Al7075/SiC fabrication by Friction stir processing** submitted for possible funding by SERB, New Delhi is my original idea and has not been copied/taken verbatim from anyone or from any other sources. I further certify that this proposal has been checked for plagiarism through a plagiarism detection tool i.e. **TURNITIN SOFTWARE** approved by the Institute and the contents are original and not copied/taken from any one or many other sources. I am aware of the UGCs Regulations on prevention of Plagiarism i.e. University Grant Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulation, 2018. I also declare that there is no plagiarism charges established or pending against me in the last five years. If the funding agency notices any plagiarism or any other discrepancies in the above proposal of mine, I would abide by whatsoever action taken against me by SERB, as deemed necessary.


09/03/23

Signature of the PI with date

Name: **Dr. D.S.ChandraMouli**


Designation: **Asst Professor**


Certificate from the Investigator

Title: Experimental investigation on Al7075/SiC fabrication by Friction stir processing.

It is certified that

1. The same project proposal has not been submitted elsewhere for financial support.
2. We/I undertake that spare time on equipment procured in the project will be made available to other users.
3. We/I agree to submit a certificate from Institutional Biosafety Committee, if the project involves the utilization of genetically engineered organisms. We/I also declare that while conducting experiments, the Biosafety Guidelines of Department of Biotechnology, Department of Health Research, GOI would be followed in toto.
4. We/I agree to submit ethical clearance certificate from the concerned ethical committee, if the project involves field trails/experiments/exchange of specimens, human & animal materials etc.
5. The research work proposed in the scheme/project does not in any way duplicate the work already done or being carried out elsewhere on the subject.
6. We/I agree to abide by the terms and conditions of SERB grant.


09/03/23
Name and signature of Principal Investigator:
Date: (Dr. D. S. Chandra Mouli)
Place: 09/03/23, Hyderabad.

Name and signature of Co-PI (s) (if any):
Date: 
Place:
CDr. R. Umamaheswara Rao)
13/03/23