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in the International Conference on Materials and System Engineering - (ICMSE-2021), organized by the
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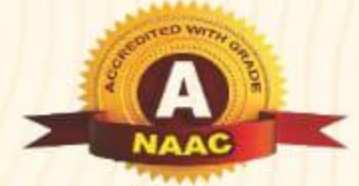
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Investigation on mechanical and Microstructural characteristics of Zn alloy MMC for bearing application

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in the International Conference on Materials and System Engineering - (ICMSE-2021), organized by the
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Studies on Bottom ash strengthened LM13 composite

Maharaja Gowda B*, Raghavendra Joshi, Rajashekhara Kuntanahal

Ballari Institute of Technology and Management, Ballari 583104, India

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ABSTRACT

Recent times, the composite materials are extensively used due to their compliance to diverse circumstances and the virtual ease of amalgamation with supplementary materials to provide explicit functions and reveal enviable properties. The application of the same is ornamental to an immense level in any of the field including engineering field. Metal Matrix Composites in short MMCs with less expansive and low density increases the demand in various applications of industrial sector. The present work uses the Bottom ash as reinforcement in MMCs which is a low density and inexpensive spin-off procured during ignition of coal in thermal power plant. Bottom ash particles are prepared to a grain size of 74 nm to 114 nm using ball milling. Basic matrix LM13 alloy is reinforced with Bottom ash particles to prepare MMCs using stir casting method. Reinforcement of Bottom ash is done in terms of weight percentages ranging from 0 to 8 in steps of 2. Composite specimens are prepared as per ASTM standard using cast ingots. Micro-structural examination of composite specimens is carried out to know the dispersion of bottom ash particle in LM13 matrix using SEM and X-ray diffraction test. At the end, the mechanical properties such as tensile, compression and hardness of specimens is evaluated by varying percentage of Bottom ash and found significant improvement in the same.

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1. Introduction

Presently the metal matrix composites are a family of novel ingredients practicing vigorous advancement in assorted fields. The potential of MMCs materials have gained significant an improvement in performance over conventional alloys has been widely recognized. Another key factor is the cost in determining the applications apart from performance. The overall cost effectiveness of the material rely on application in addition to material cost. Also it depends on the process through which the material advances. Properties of aluminium alloys such as low density, deterioration and wear resistance, less thermal coefficient of expansion rendered for various applications compared with conventional metals and alloys. Al2024 reinforced with Al₂O₃ particles as reinforcement up to 30% prepared by peak method and consequence tested pressure and studied the effect of porosity and other properties [2,7]. Currently, the fly-ash particles are used as reinforcement due to low cost, low density and as well it is the waste by-product from thermal power plant and industries. Further, used

in aluminium metal matrix composite and evidenced that it can enhance mechanical properties in turn widely used in light weight vehicles applications [6]. Bottom ash as a solid residue is one of the disposable product to despite the use of the bottom ash in construction materials, it can also used as an reinforcement in the MMC's which will be also an alternative for the traditional material from thermal power plant [1]. The characteristics of A356 alloy reinforced with bottom ash by stir casting method little improvement over the strength to weight ratio, hardness, yield strength and tensile strength but decreases in ductility [3]. Aluminium matrix composites toughened with weight percentage of 5% fly ash particle has been prepared using stir squeeze cast method. Abrasive wear test has been done to determine the wear resistance against different speed and loads. Results have shown an improvement in the abrasive wear resistance [4,5].

2. Material selection and preparation

2.1. Matrix materials

LM13 alloy have the properties like high strength and hardness at higher operating temperature. It is having better confrontation

* Corresponding author.

E-mail address: maharajagowdab@gmail.com (M. Gowda B).

Table 1
Chemical composition of LM13.

Cu	Zn	Mg	Si	Ni	Fe	Mn	Pb	Sn	Ti	Al
0.7%	0.5%	1.5%	12%	1.5%	1%	0.5%	0.1%	0.1%	0.2%	Bal

Table 2
Chemical composition of Bottom ash.

SiO ₂	AlO ₃	FeO ₃	CaO	MgO	NaO ₂	K ₂ O
53.6%	28.3%	5.8%	0.4%	4.2%	1.0%	0.3%

to bear, superior bearing chattels, and a little coefficient of thermal expansion which will allows us to use in IC engine components like piston and connecting rod. Also, it is having fluidity property which is useful in casting intricate components with thin cross section like connecting rod. The chemical composition of the same in terms of weight percentage is tabulated in Table 1.

2.2. Reinforcement material

The Bottom ash is used as reinforcement particles that are collected from Ballari thermal power station, Karnataka. The reinforcement particles with average dry density 1.4 g/cc are used. The bottom ash is prepared to the average of 100 nm grain size through ball milling process. The chemical symphony of the same in terms of weight percentages is listed in Table 2.

The components are prepared through liquid metallurgical process due to certain advantages pertaining to low operating cost and moderately simplicity of producing intricate pieces. Though the devices and processes are distinctively well-matched for unstrengthened metals or alloys, all of them have various detrimental things which makes impracticable facsimile of proportions to close tolerances. Further using them in the production of toughened materials, the outcome is prominent due to short of clear-cut control over route constraints [8]. Manual controlled electrical Resistance furnace is used to melt aluminium alloy. LM13 alloy is poured in crucible and in turn it is kept in furnace chamber and closed using blanket for melting the same. The temperature of 350 °C is set for 1st cycle with duration of 30 min. Further it is continued the melting process raising the temperature up to 740 °C for 2nd, 3rd and 4th cycles with time duration of 30mins, 30 min and 60 min respectively. Fig. 1 shows the heating furnace along with control unit. The quantity of reinforcement and matrix ratio in terms of weight percentage is publicized in Table 3.

Certain measures such as even distribution of reinforcement material and feasible vertex have been taken to prepare the test samples. However, the vertex obtained may lead to trap the air bubbles and as well stirring speed influences the uniform distribution of bottom ash particles. Stirrer is made of high carbon steel. The speed of the stirrer is around 220 rpm with a time period of 10 min for all weight percentage of reinforcement in LM13. The degassing tablet namely Hexachloroethane (C₂Cl₆) is used to remove few dissolved gasses before pouring and then allowed for solidification as shown in Fig. 1(a). The outcome of the process is shown in Fig. 1(b).

2.3. Specimen preparation

The samples were prepared for the various tests as per the ASTM standard. The photographs of the specimens prepared are shown in Fig. 2(a) for tensile test, 2 (b) for compression test and 2 (c) for hardness respectively.



Fig. 1. (a) Pouring of molten metal into the die; (b) Removing of cast composite from die.

Table 3
The amount of reinforcement and matrix in composite.

LM13 in grams	1500	1470	1440	1410	1380
Bottom ash in grams	0	30	60	90	120

3. Result & discussions

3.1. Scanning electron microscopy (SEM)

Fig. 3(a) and (b) shows the SEM images for the composite specimens reinforced with 2% and 6% of bottom ash. It has been

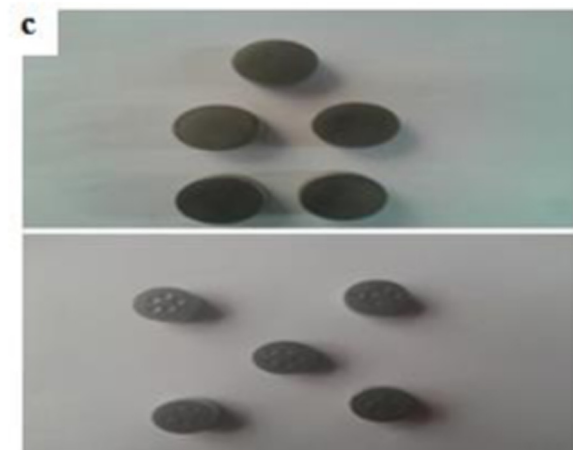


Fig. 2. Specimen prepared as per ASTM for (a) Tensile test; (b) Compression; (c) Hardness test.

observed that the dispersion of average size of the reinforced particles with different orientation at various points throughout the specimen. Also, it has exhibited crystalline structure. The chemical

composition of the prepared samples has been evaluated using EDS process. The solid surface of specimen was prepared by using different grits of emery paper after the surface is etched with Gold/Palladium liquid agent for the analysis of microstructure. The result indicates lesser sputter rates as the Au/Pd alloy (60/40 and 80/20) is less competent to coat than with pure gold. Au/Pd is over and over again suggested to get a smaller grain dimension. Au/Pd does upshot in slighter grain size when evaporated in high vacuum, however used in SEM sputter coaters the disparity among Au and Au/Pd is scarcely detectable. Pd alloy is less appropriate for heat perceptive samples and as well for EDX analysis due to extra set of peaks.

3.2. Energy Dispersive Spectroscopy (EDS) micrograph study on weight of 6% prepared AMMC's

Fig. 4 shows the EDS result that reveals the information about quantity and type of chemical element present after the addition of reinforcement. It also assists to assess multi-layer thickness of metallic coatings and analysis of various alloys.

3.3. Tensile strength

Fig. 5 shows the effect of Bottom ash particle in wt % on ultimate tensile strength. It has been observed that the addition of Bottom ash particle improves the tensile strength of composites. Bottom ash as a reinforcement material contains hard particles along with soft ductile in nature of LM13 matrix improves the tensile strength. This will be endorsed to develop high lasting stress all through solidification and due to miss-match of thermal expansion between particle and soft Al matrix. The increase in strength may also be outcome of compactness of reinforcement with soft aluminium matrix. Wetability is one of the resisting criteria for the occurrence of better bonding between reinforcement and matrix. This indicates an improvement of the tensile strength of the composite.

3.4. Compression strength results

The result of Bottom ash particle in wt % on yield compressive strength obtained from uniaxial compression load can be shown in Fig. 6. Addition of Bottom ash particle at 6 wt% causes an improvement in compressive stress. Beyond 6 wt% of Bottom ash particles, the compressive stress is decreased. The cavity is formed at an interface of Bottom ash particle and matrix that experiences tensile loading. This cavity formation lowers the composite properties because of the lowered in load transfer from matrix to fiber

3.5. Hardness results

Fig. 7 shows hardness value of LM13 and the composite containing varying Wt% of Bottom ash particle. It shows that the addition of Bottom ash particle in LM13 matrix improve the hardness value of composites up to 6 wt% and beyond 6 wt% of Bottom ash particle with LM13 reduces. The dispersion of Bottom ash particle improves the hardness, as particle are hardness more than LM13, and provides their inherent characteristics of hardness value to soft matrix.

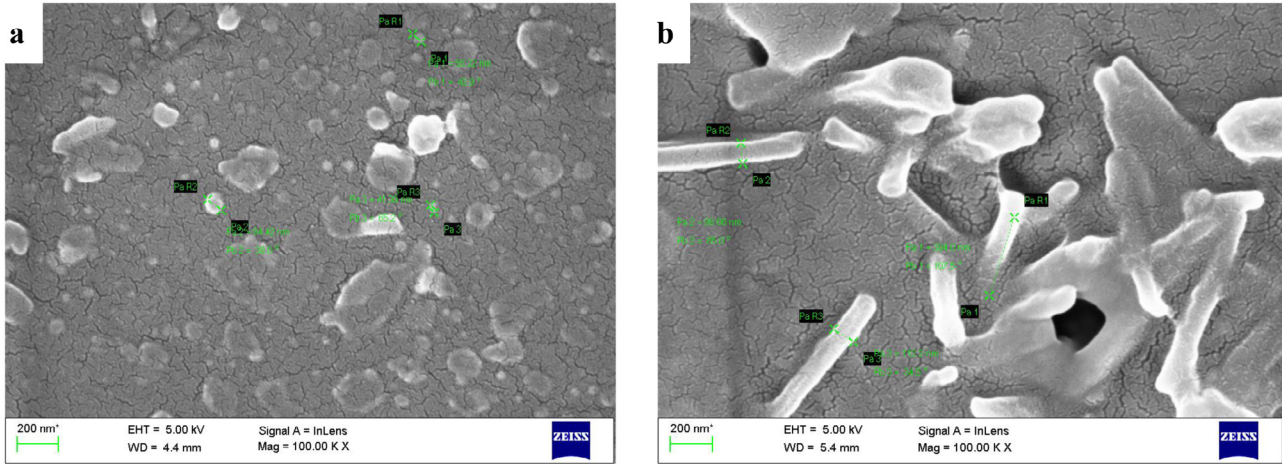


Fig. 3. The microstructure of the different specimens containing LM13 reinforced with Bottom ash (a) 2% Weight of Bottom ash; (b) 6% Weight of Bottom ash.

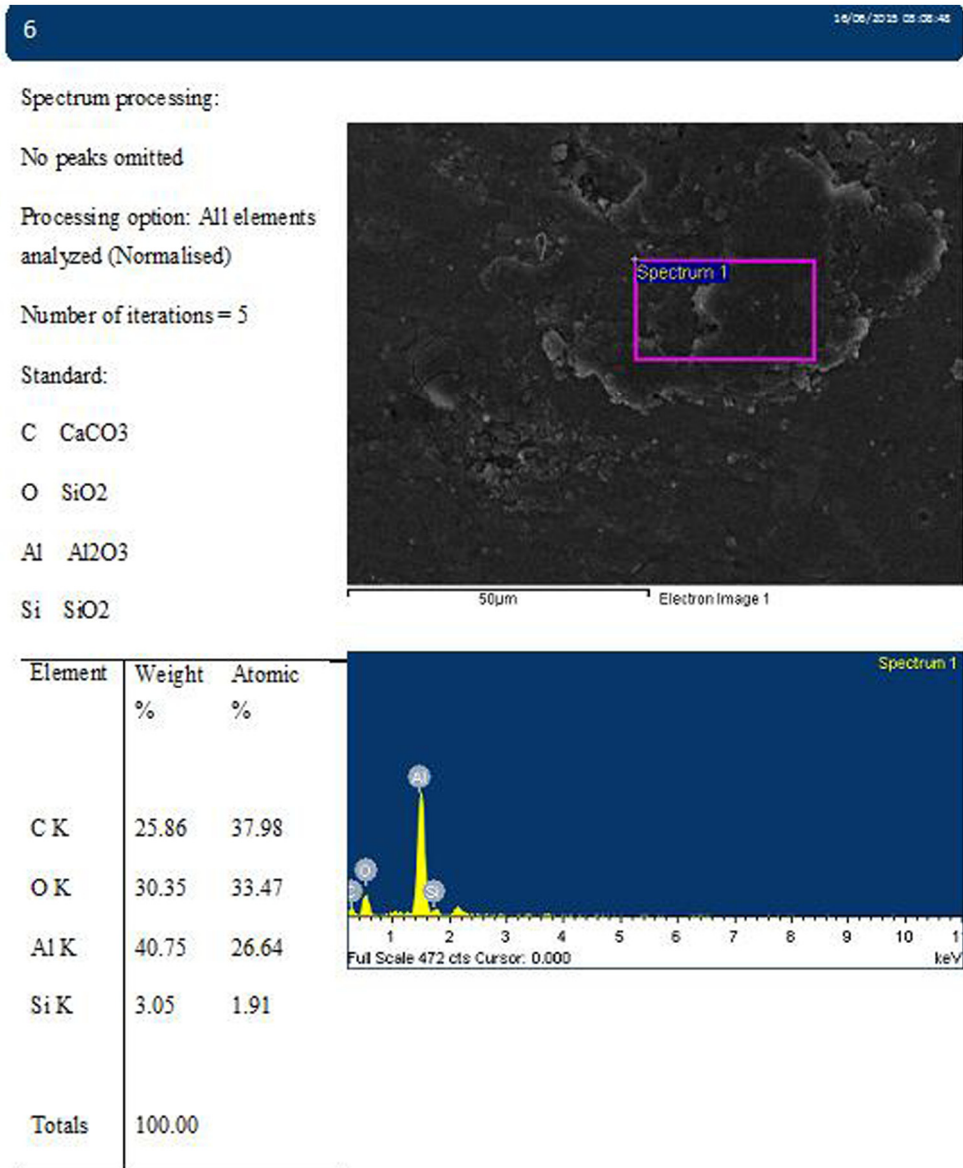


Fig. 4. Assessment and evaluation based on Energy Dispersive Spectroscopy (EDS) micrograph study.

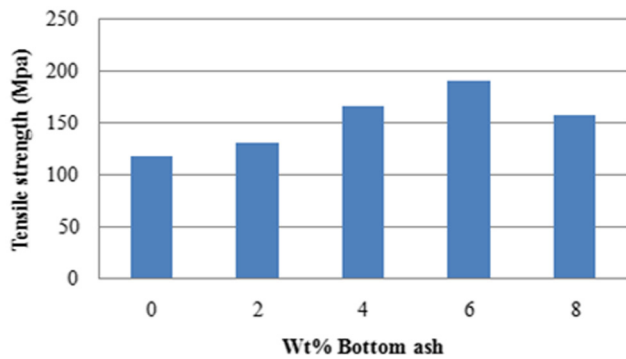


Fig. 5. Effect of Bottom ash wt % on tensile strength of composites.

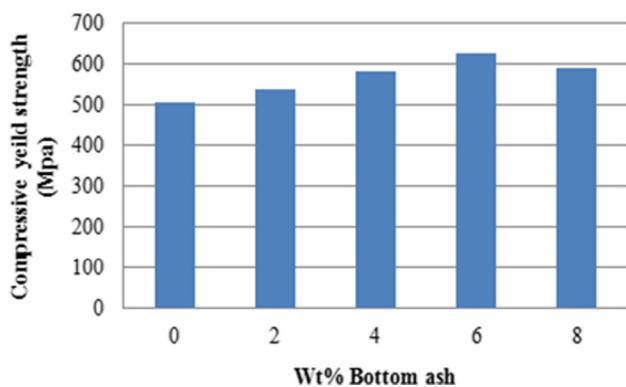


Fig. 6. Effect of Bottom ash wt % on compressive strength of composites.

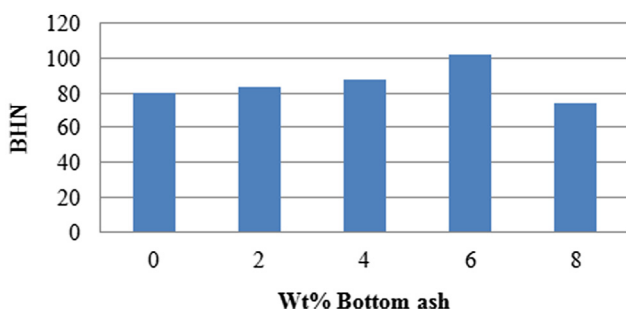


Fig. 7. Effect of Bottom ash wt % on hardness of composites.

4. Conclusions

Aluminium LM13/Bottom ash particle composite was successfully prepared by stir casting process and evaluated for different

properties from the analysis. The following conclusions are drawn and as follows:

- (i) From the microstructure studies such as SEM and EDS micrographs it is revealed that the composite fabrication has fairly even dispersion of bottom ash particle in the LM13 matrix.
- (ii) By adding Bottom ash particles in varying Wt% in LM13 significantly improved ultimate tensile strength of MMCs compared to unreinforced matrix of LM13. The ultimate tensile strength of Bottom ash/LM13 composite has been improved by 60.20% at 6 wt% of Bottom ash reinforcement. However, the ultimate tensile strength slowly decreased above 6 wt% of Bottom ash. It has been found that the Brinell hardness number of the specimen increases with increase in the wt% of the reinforcement particles. It was noticed that the maximum hardness value is 109 BHN for 6 wt% of bottom ash particles.
- (iii) Adding of Bottom ash in LM13 matrix clearly showed improvement in compressive strength up to 6 wt%. It has been noticed that the decrease in value of compressive strength by adding above 6 wt% of Bottom ash.

Overall it has been concluded that there is an improvement in the mechanical properties of the bottom ash reinforced LM13 composite specimen.

Declaration of Competing Interest

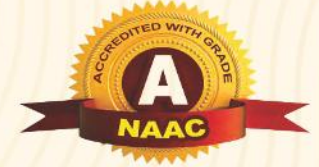
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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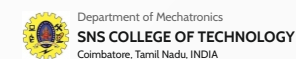
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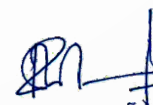
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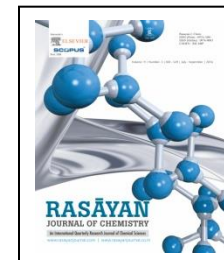
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
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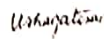



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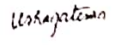



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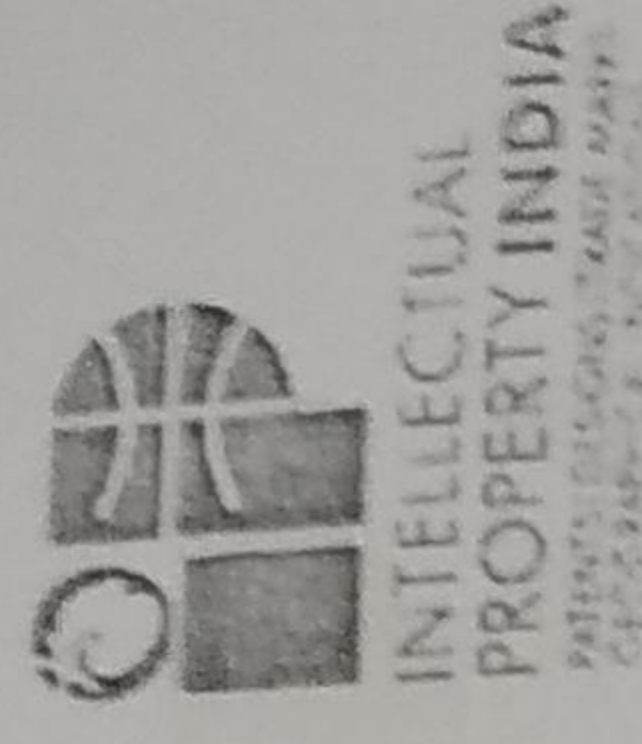
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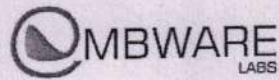
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MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF Zn85-15Sn ALLOY WITH NANO B₄C REINFORCED COMPOSITES

SANTOSH.V. JANAMATTI¹, U.M DAIVAGNA², MADEVA NAGARAL³,
VEERABHADRAPPA ALGUR⁴

¹Research scholar Ballari Institute of Technology and Management Ballari,India

²Professor Ballari Institutes of Technology and Management Ballari,India

³Deputy Manager, ARDC, HAL, Bangalore, Karnataka, India

⁴Santosh4076@gmail.com

ABSTRACT:Investigation is made on the effect of nano sized B₄C particulates on Zn85-Tin 15alloy. Nano B₄C particulates are used as reinforcement in the Zn-Tin matrix. Composites are fabricated by using two-step route method instep of B₄C 0%, 2%, 4% and 6%, and 8% by weight. Casted samples were tested for Microstructural SEM, EDS, XRD analysis and mechanical tests as Tensile, Hardness, and Compression Strength are evaluated as per the standards. SEM micrograph reveals the uniform distribution of B₄C particulates in the Zn-Tin matrix and is confirmed by EDS analysis. Further, XRD analysis confirmed the B₄C phases on Zn-Tin matrix. Hardiness, Tensile, Compression strength of the base matrix alloy is enhanced with the addition of B₄C reinforcement.

KEYWORDS:Zn85-Sn15, B₄C particulates, Stir casting

I. INTRODUCTION

Copper and copper base alloys are widely used in aerospace, automobile and aircraft for bearing application due to its properties like light weight, low density, superior corrosion resistance, high strength and stiffness etc [1, 2]. Recent expansion in research indicates that copper is replaced by some other non ferrous materials. An enhancement of the bearing surfaces, increasing the wear properties of bearing alloys, with high coefficient of friction and the use of hybrid materials are of ways that the scientists proposed to increase wear properties of bearing materials. Bearing elements plays a vital role in different industries such as aerospace, automotive, chemical, aircraft applications. This work proposes the Zn base alloys, the application of Zn alloy with improved properties will meet the industry requirements [3- 6].

Zinc metal matrix composites (ZMMC) can be processed by methods as liquid metallurgy because simplicity in processing and better properties [7, 8]. K₂TiF₆ halide salt is mixed uniformly with B₄C during casting and has resulted in better bonding between Zn alloy and B₄C and also use of mechanical stirrer and rigorous stirring helps in the homogeneous distribution of particulates in the metal matrix. Two –step addition of reinforcing particulates is adopted in liquid metallurgy which helps in the homogenous distribution and to overcome the agglomeration of particulates [9]. Metal matrix composite containing Zinc85%-Tin15%wt. % with B₄C 0, 2, 4 and 6, 8 wt. % reinforced samples were fabricates using two –stage stir casting method [10].

II. METHODS AND MATERIALS

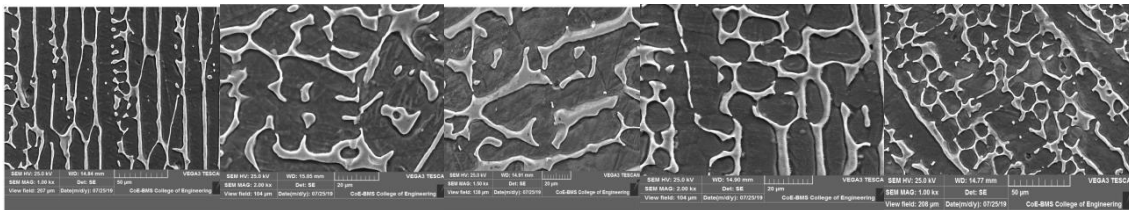
The Zinc85%-Tin15%wt. % with B₄C 0, 2, 4 and 6, 8 wt. % reinforced samples were fabricates using two –stage stir casting method. The electric resistance furnace and materials was used for casting is shown in figure 1. Required wt% of Zn-Sn alloy as matrix material as in billet shapes were placed in a carbide crucible, which was placed inside the furnace maintain at a temperature of around 750°C. At this temperature entire Zn-Sn alloy was melt after melting of base alloy collect reinforcement and calculate required wt% of B₄C powder. Calculated amount of reinforcement was added in to crucible which contains melted Zn alloy. Which involve two-stage additions of calculated amount of reinforcement during stirring Potassium Titanium Fluoride (K₂TiF₆) degassing powder was also added in to molten metal, which helps to remove the gases from the melt [14].This two stage casting method which helps to increases bonding strength of the matrix and ceramic reinforcement.



Figure 1 shows the Zn-Tin Alloy and B₄C particulates of size, Electrical resistance furnace

III. RESULTS AND DISCUSSION

SEM Analysis



(a)(b) (c)(d) (e)

Figure 2: The SEM micrographs of (a) casted Zn-Sn matrix and (b) Zn-Sn with 2 wt% of B₄C (c) cast Zn-Sn with 4wt% of B₄C reinforcement and (d) Zn-Sn with 6wt% of B₄C reinforcement, (e) Zn-Sn with 8wt% of B₄C reinforcement.

From Figure 2: shows that the Scanning Electron Microscope micrographs of (a) cast Zn_{85%}-Sn_{15%} alloy (b) Zn-Sn matrix with 2 wt. % B₄C (c) Zn-Sn matrix 4 wt. % B₄C composites (d) Zn-Sn matrix 6 wt. % B₄C composites (e) Zn-Sn matrix 8 wt. % B₄C composites. From Figures 2(b-e) is the evidence of distribution of B₄C reinforcement particulates in different wt% of B₄C and it can be observed that there was fine and uniform distribution of particles without any cluster formation. Further, from the photographs, that casted metal matrix composites shows very low segregation; due its involved two-stage reinforcement mixing method.

EDS Analysis

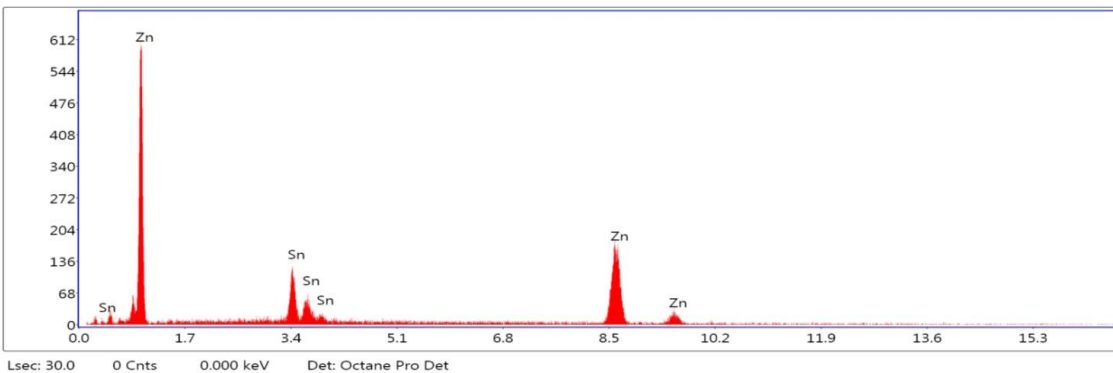


Figure 3. (a): Energy Dispersive Spectroscopy of Casted Zn_{85%}-Sn_{15%} alloy matrix

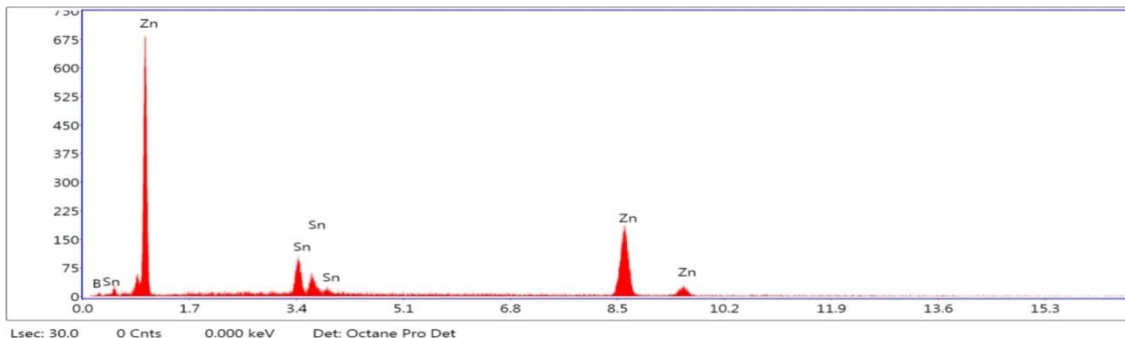


Figure3. (b): Energy Dispersive Spectroscopy of Casted Zn_{85%}-Sn₁₅ matrix with 2wt % of B₄C particulates

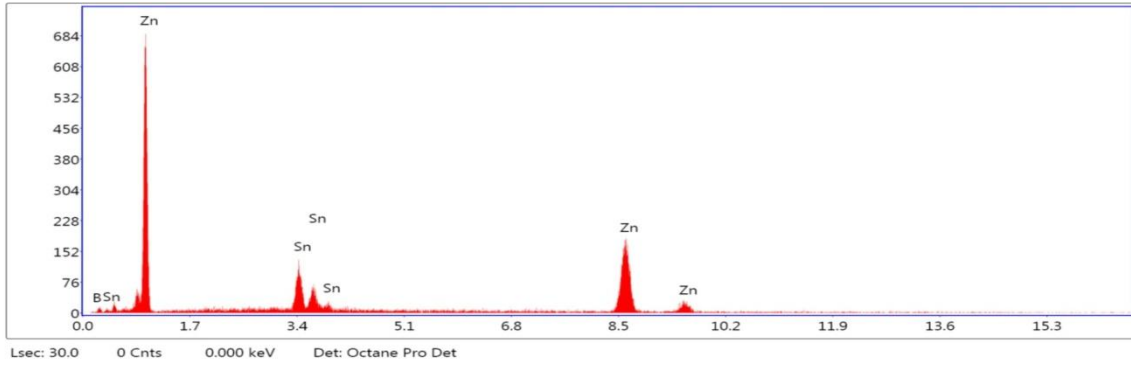


Figure 3.(c): Energy Dispersive Spectroscopy of Casted Zn85-Sn15 Alloy with 4 wt % of B₄C particulates

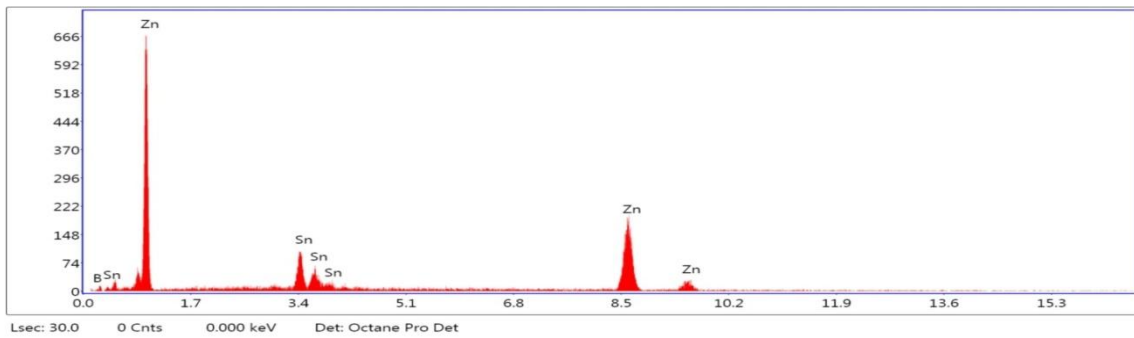


Figure 3.(d): Energy Dispersive Spectroscopy of Casted Zn85-Sn15 Alloy with 6 wt % of B₄C particulates

From the Figure: 3.(a-d) shows Energy Dispersive X-Ray Spectrographs of Zn85-Sn15 alloy-with 2, 4, and 6, wt. % of boron reinforcement respectively. The Energy Dispersive Spectroscopy analysis is the evidence to confirm the existence of boron particles in the Zn –Sn alloy matrix. And also this graph confirmed boron and carbide elements are present in Zn alloy matrix by indicating B (Boron) and C content (Carbide) in EDS analysis.

XRD Analysis

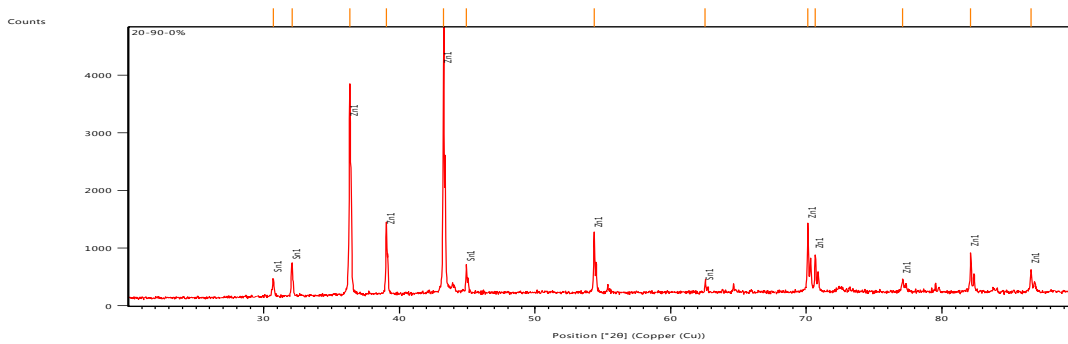


Figure 4. (a): X-Ray diffraction Analysis of Casted Zn85-Sn15 Alloy Matrix

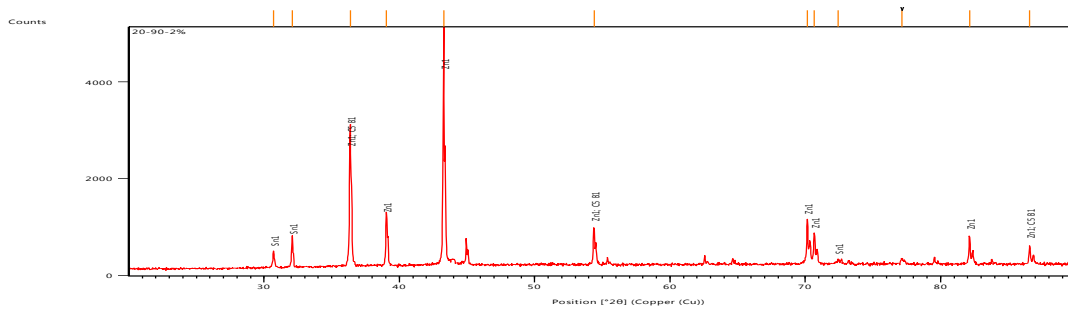


Figure4. (b): X-Ray diffraction Analysis of Casted Zn85-Sn15 Alloy with 2wt % of B₄C reinforcement

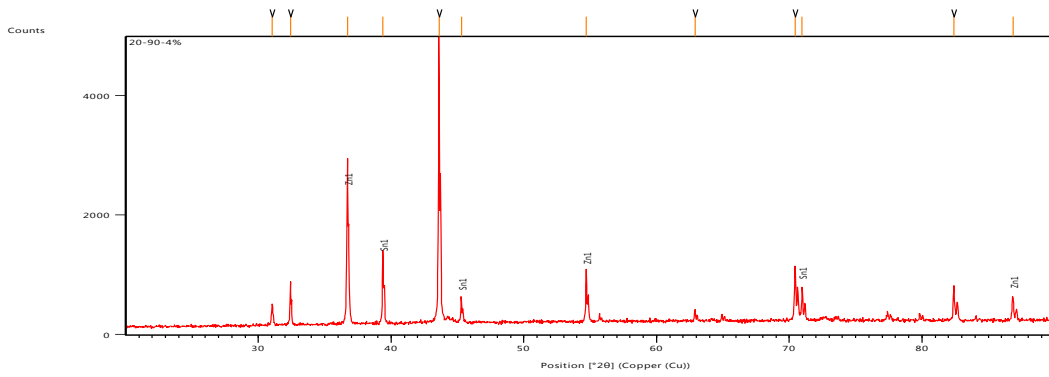


Figure4. (c): X-Ray diffraction Analysis of Casted Zn85-Sn15 Alloy with 4wt % of B₄C reinforcement

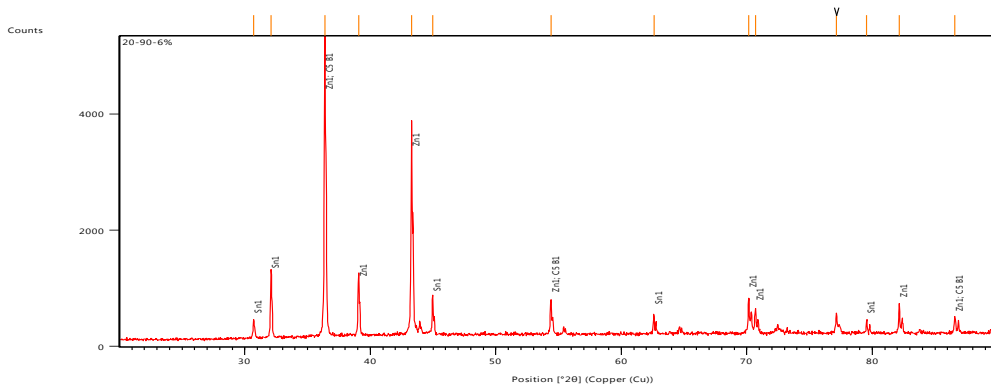


Figure4. (d): X-Ray diffraction Analysis of Casted Zn85-Sn15 Alloy with 6wt % of B₄C reinforcement

Figure: 4 (a-d) shows XRD Analysis of Zn-Sn alloy-with 2, 4, and 6, wt. % of B₄C reinforcement respectively. XRD Analysis is the evidence to confirm the presence of Sn phase over Zn matrix, and boron carbide phase in the Zn –Sn alloy matrix.

IV. MECHANICAL PROPERTIES

Tensile Properties

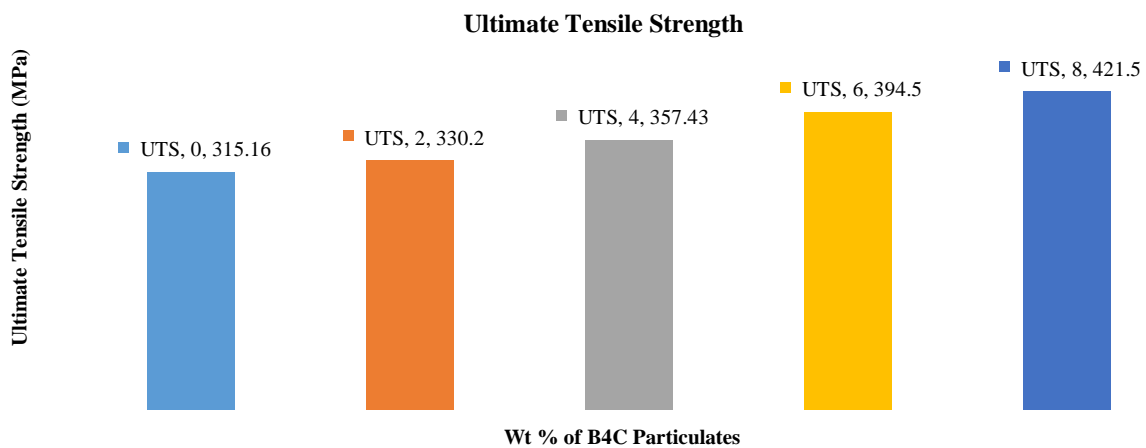


Figure: 5. (a) Ultimate tensile strength of as cast Zn-Sn alloy with 2, 4, 6 & 8 wt. % nano B₄C reinforcement

From the above figure, Ultimate Tensile strength of as casted Zn alloy with 2-8 Wt % of boron carbide reinforcement. It was indicated that ultimate tensile strength of base matrix Zn-Sn alloy was increased by increasing the hard ceramic boron carbide particles as its shown from the graph 2-8wt % of B₄C. Due to uniform mixing of harder particles in to soft Zn alloy base with help of stir casting that ensure the Substitutional solid solution and followed by the Hume Rothery’s rules.

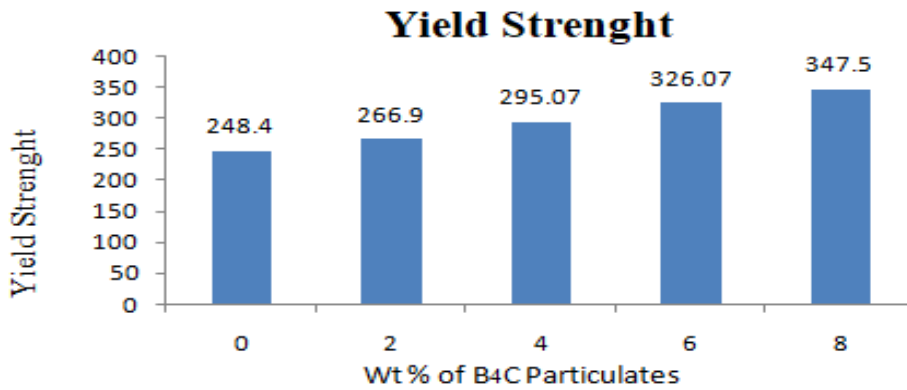


Figure: 5. (b) Yield strength of as cast Zn₈₅-Sn₁₅ alloy with 2, 4, 6 & 8 wt. % nano B₄C reinforcement

From the above figure, Yield strength of as casted Zn alloy with 2-8 Wt % of boron carbide reinforcement. It was indicated that Yield Strength of base matrix Zn-Sn alloy was increased by increasing the hard ceramic boron carbide particles as it's shown from the graph 2-8wt % of B₄C. Due to uniform mixing of ceramic particles in soft Zn alloy base matrix. [3] Many of ceramics like boron carbide will resist external load as compare to soft materials and due this they will not easily deforming plastically, hence their yield resistance percentage will be increases.

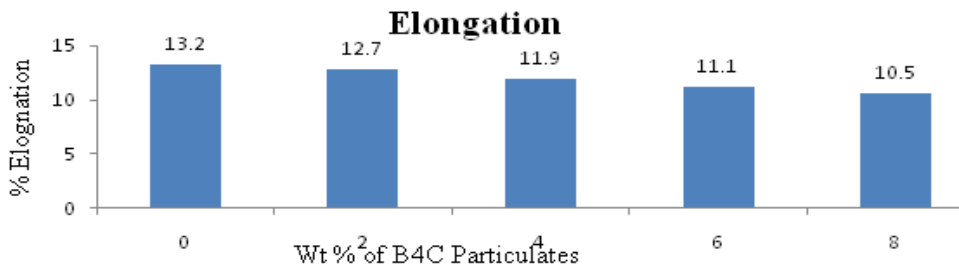


Figure: 5. (c) Percentage elongation of as cast Zinc-Tin alloy with 2, 4, 6 & 8 wt. % nano B₄C composite

From the above figure, % of Elongation of as casted Zn alloy with 2-8 Wt % of boron carbide reinforcement. It was indicated that % of elongation of base matrix Zn-Sn alloy was decreased by increasing the hard ceramic boron carbide particles as it's shown from the graph 2-8wt % of B₄C. Due to uniform mixing of harder particles into soft Zn alloy base. Many of ceramics like boron carbide will resist external load as compare to soft materials and due this they will not easily deforming plastically, hence their yield resistance percentage will be increases. However ductility of the composites will be decreases by increasing a surface crack.

Hardness number

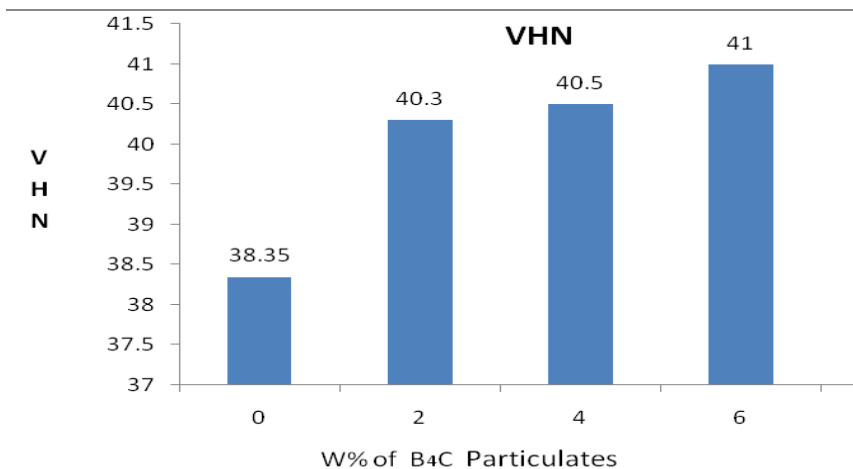


Figure:6. (a) Hardness of as cast Zn-Sn alloy with 2, 4, 6 & 8 wt. % nano B₄C reinforcement

Hardness values of the Zn-Sn alloy with 2- 8 wt. % B_4C reinforcement have been obtained by Vickers hardness tester. It was indicated that hardness of base matrix Zn-Sn alloy was increased by increasing the hard ceramic boron carbide particles as it's shown from the graph 2-8wt % of B_4C . When a ceramic reinforcement is integrated into a soft ductile base material; the hardness of the base material is improved. Due to proper heterogeneous nucleation formed by two step liquid stir casting method which was ensure the perfect nucleation.

Compression Properties

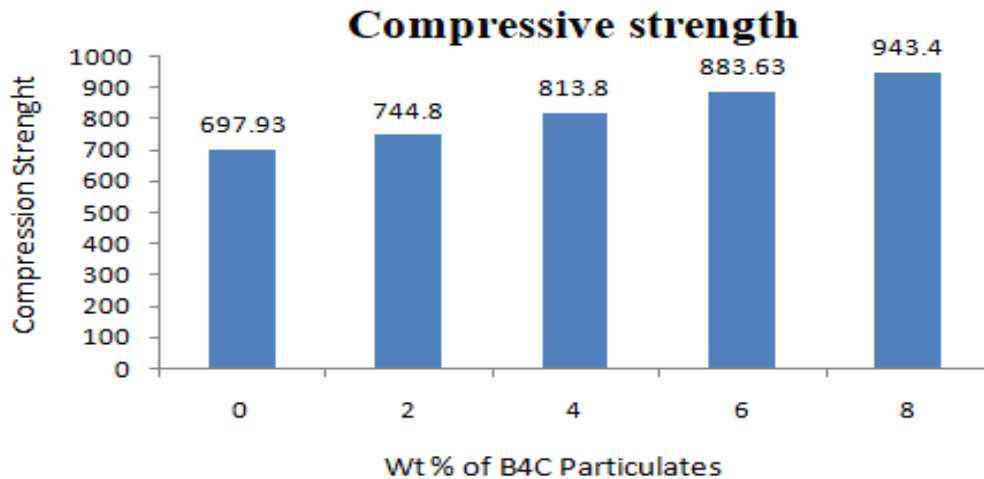


Figure: 7. (a) Compressive strength of as cast Zn85-Sn15 alloy with 2, 4, 6 & 8 wt. % nano B_4C reinforcement

From the above figure Compressive strength values of the Zn alloy with 2-8 wt. % B_4C composites have been obtained by compressive testing machine. It is evidence that the Compressive strength of base metal Zn-Sn alloy was increased by increasing the wt % of boron carbide reinforcement. Its mainly due to hard ceramic phase is embedded with base matrix that made the composite to resist enough plastic deformation by external load.

V. CONCLUSIONS

Based on the research of the synthesis and characterization of varying size B_4C particulates reinforced Zn alloy composite, the overall conclusions are as follow.

1. Zn-Sn alloy with 2, 4, 6 and 8 wt. % B_4C nano composites samples were prepared successfully by using two step stir casting route.
2. The SEM and EDS confirmed uniform distribution of nano B_4C particulates in Zn- Sn base alloy and presence of boron and carbide elements in Zn-Sn alloy Matrix.
3. The Vickers hardness values of Zn-Sn base alloy improved with increasing of 2- 8 wt. % of nano B_4C reinforcements.
4. The Tensile properties as Ultimate Tensile Strength and Yield Strength of Zn85-Sn15 base alloy was enhanced by adding Nano B_4C particulates from 2-8 wt % of reinforcement.
5. The % of ductility of Zn85-Sn15 base alloy was decreased respectively by increasing wt % B_4C particulates into the base matrix.

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Cc: sastryrenu@gmail.com, puithpabv75@gmail.com, manju_13krt@yahoo.co.in
Bcc: sastryrenu@gmail.com

Tue, Apr 7, 2020 at 8:01 PM

Dear Author(s),

We like to inform you that we have received 24 Research papers for publication in Shodh Sanchar Bulletin (ISSN No. 2229 3620). All the papers are accepted for publication in March Issue 2020.

The Article processing charge (APC) of the journal is Rs 3000/- which includes Printed journal, Printed Certificate and courier charges).

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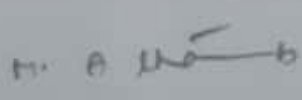
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This is to certify that Dr./Mr./Ms. P. DEVIKA RANI, Asst. Professor,
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India in collaboration with TNSCST held on 24th & 25th March 2021.

Topic: "Mergers and Acquisitions - A Conceptual
Review"


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Dr. (Mrs.) M. Amthul Thawab
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MERGERS AND ACQUISITIONS - A CONCEPTUAL REVIEW

Prof. Devika Rani P.¹, Dr. Prashanth K. C.²

¹Assistant Professor, DMS, Ballari Institute of Technology and Management, Ballari

²Research Guide, Department of Management Studies, VSK University, Ballari

¹devikarani.vms@gmail.com, ²prashanthkapli@gmail.com

ABSTRACT:

Purpose: The present paper is an attempt to review scholastic research on various aspects of Mergers and Acquisitions. The various aspects covered include; determinants of M&As, value creation through M&As, impact of M&As on financial and operating performance, cross border M&As and impact study of M&As. The studies reveal that M&As may impact target and acquirer firms in a positive, negative and mixed manner.

Methodology: To carry out the review, articles in referred journals published between 2001 to 2018 have been reviewed with a focus on highlighting various dimensions of M&A. Review is done taking studies that are carried both within and outside India.

Research Limitations: The scope of the study is confined only to some dimensions of M&A and they are mostly theoretical in nature than empirical.

Keywords: M&A, financial performance, operating performance, Cross border.

I. INTRODUCTION:

If many are called to life and few are chosen to live, how are the favored few selected? The answer to this question is the modern doctrine of evolution; it is "the survival of the fittest in the struggle for existence"; it is the philosophy that Darwin embodies in the phrase "natural selection". The concept of the "struggle for existence" concern the competition for resources needed to live. It can refer to human, or to organisms in nature. Corporates are not an exception. Corporate India is facing unprecedented challenges, both within and outside the domestic market. In the context of liberalization and globalization, the changes required in the functioning of corporates need to be vast. It becomes crucial for all the corporations to review their alignment of vision, values, strategy, skills, structure, systems, technologies and corporate work culture. In the light of review they need to either re-enforce or restructure this alignment. M&A are the outcome of their eternal desire for growth and change. Multinational companies have not only brought new business strategies, new technology, but also new leadership style and a unique work culture. The competition between multinational companies and the local companies has paved the way for adopting more sophistication in the finances, operations and innovative HR practices to live and flourish in the market.

II. REVIEW OF LITERATURE:

2.1 Studies on determinants of M&As

Dorsta, N. (2012) examines the features of acquirers to identify stakeholder variables of business combinations contributing to measure firms' strengths and concerns. A sample of 219 publicly-held mergers and acquisitions of US companies for a period from 1995-1998 are chosen and the results reveal that mergers and acquisition transaction do impact the evaluation of corporate strength and weaknesses. Khan, A. A. (2011) the article explores various motivations of Mergers and Acquisitions in Indian banking sector. Comparison between pre and post-merger financial performance of merged banks during the post liberalization regime using financial parameters are studied. Independent t-test is used to test the significance of the study and found that banks have positively affected by mergers and acquisitions. André, P., Kooll, M., & L'Her, J. F. (2004) The authors in their article studies the M&A wave of late 1990s by selecting a sample of 267 Canadian stocks between 1980 and 2000. The author also identifies potential variables of post-acquisition abnormal performance to understand the value creation or

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Students Publication Details for the AY 2020 (Batch 2018- 2020)				
SN	USN	Name of the Student	Title of the Paper	Publication Details
1	3TR18MBA33	Madhubala H	Financial Statement Analysis of Karnataka State Financial Corporation	IJARESM, Volume 8, Issue 12, December-2020, Impact Factor: 7.429, Available online at: www.ijaresm.com
2	3BR18MBA21	Hanumanthamma	An Empirical Examination of Beta Stability in Steel Industry	IJARESM,, ISSN: 2455-6211, Volume 8, Issue 9, September-2020, Impact Factor: 4.597, Available online at: www.ijaresm.com
3	3TR18MBA81	Vaishnavi C K	Dupont Model Of Sensex 30 Companies: A Study Conducted For The Period From 2010-19	IJERMCA, ISSN: 2319-7471, Vol. 9 Issue 10, October-2020, Impact Factor: 7.751
4	3BR18MBA31	Kogilethota Veeresh	Omni Channel Retailing and Customer Loyalty	IJERSTA, ISSN: 2319-7463, Vol. 9 Issue 10, October-2020, Impact Factor: 6.754
5	3BR18MBA67	Shakeela Banu	A study of employee welfare measures and its impact on employee motivation	IJARESM, ISSN: 2455-6211, Volume 8, Issue 9, September-2020, Impact Factor: 4.597, Available online at: www.ijaresm.com
6	3TR18MBA27	Krishna Priya B	Study on the Evaluation of Customer Disposition towards Nandini Milk and Milk Products	IJERMCA, ISSN: 2319-7471, Vol. 9 Issue 11, November-2020, Impact Factor: 7.751
7	3TR18MBA32	Madhavi P	Impact of Employee Welfare Measures on Employee Satisfaction and Employee Intention to Stay with the Organization	IJARESM, ISSN: 2455-6211, Volume 8, Issue 10, October-2020, Impact Factor: 4.597, Available online at: www.ijaresm.com
8	3TR18MBA86	Vyas Jayesh Arvind	An Analysis of Stock Market Performance Using Jensen, Sharpe And Treynor Measure	IJERMCA, ISSN: 2319-7471, Vol. 9 Issue 11, November-2020, Impact Factor: 7.751
9	3BR18MBA07	Ayesha S	Employee Relationship Management For Better Culture, A Study of Public Transport Department	IJERSTA, ISSN: 2319-7463, Vol. 9 Issue 8, August-2020, Impact Factor: 6.754
10	3TR18MBA15	Edupuganti Vamsikrishna	A Study On Five Dimensions Of Service Quality	IJARESM, ISSN: 2455-6211, Volume 8, Issue 8, August-2020, Impact Factor: 4.597, Available online at: www.ijaresm.com
11	3TR18MBA40	Murari Sai Nikitha	Impact of Muhurat Diwali Trading on Indian Stock Index Returns	IJERSTA, ISSN: 2319-7463, Vol. 9 Issue 10, October-2020, Impact Factor: 6.754
12	3BR18MBA09	Banasankari K	Digitalization in HR tools and it's convenience among Employees	Journal of University of Shanghai for Science and Technology ISSN: 1533-9211
13	3TR18MBA04	Arpitha G	Sourcing Channels in Recruitment: A Case Study of Indian Banking Sector	Circular Economy, Management and Industry 4.0 Towards Sustainability 978-81-949278-4-6
14	3TR18MBA38	Mohsinah S	A Study on Comparison of Indian Stock Market with Dollar Price	Circular Economy, Management and Industry 4.0 Towards Sustainability 978-81-949278-4-6

Students Publication during the Academic Year 2018-2019

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SN	USN	Name of the Student	Title of the Paper	Publication Details
1	3BR17MBA19	Ghousiya Banu S	Performance Evaluation of Socially Responsible Stocks and its linkages with BSE Greenex Index and BSE Sensex Index	IJARESM ,ISSN: 2455-6211, Volume 7, Issue 9, September- 2019, Impact Factor: 2.287
2	3TR17MBA58	Sai Prashanth K	Comparative Study of Mid Cap and Small Cap Companies Listed at BSE	IJERSTE,ISSN: 2319-7463, Vol. 8 Issue 9, September -2019, Impact Factor: 6.754
3	3BR17MBA70	Varsha K S	Risk-Return Analysis – A Study Of Banking Sector	IJERMCA,ISSN: 2319-7471, Vol. 8 Issue 10, October-2019, Impact Factor: 5.945
4	3TR17MBA37	Nallani Manoj Kumar	Analysis Of Portfolio Management Of Mutual Funds	IJERSTE ,ISSN: 2319-7463, Vol. 8 Issue 11, November -2019, Impact Factor: 6.754
5	3TR17MBA06	Akhila. P	Performance Appraisal And Productivity	IJARESM,ISSN: 2455-6211, Volume 7, Issue 11, November- 2019, Impact Factor: 4.597
6	3TR17MBA02	Aishwarya Yadav B	Impact of online and conventional ticket reservation system on buying behavior of customer	IJERMCA,ISSN: 2319-7471, Vol. 8 Issue 12, December-2019, Impact Factor: 5.945
7	3BR17MBA15	Fuzail Ahammed M	Real Estate at Bangalore-A study at NR Green Constructions.	IJERSTE,ISSN: 2319-7463, Vol. 8 Issue 12, December -2019, Impact Factor: 6.754
8	3BR17MBA13	Chaitra Hundekar	Impact of Training and development on executive for better productivity-A case study of cement Indsutry in Karnataka	IJARESM,ISSN: 2455-6211, Volume 7, Issue 10, October- 2019, Impact Factor: 2.287
9	3TR17MBA75	Veerendra T	A Study On Impact Of Digital Marketing In E-Education with special reference to GRID Bangalore	IJERMCA,ISSN: 2319-7471, Vol. 8 Issue 9, September-2019, Impact Factor: 5.945

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SEPTEMBER 2021



Girish Kumar <giri4893@gmail.com>

Transaction Alert on Atom Gateway for transaction done on NITTTR CHENNAI

2 messages

admin@atomtech.in <admin@atomtech.in>
To: giri4893@gmail.com

Thu, Jul 30, 2020 at 11:00 AM

Dear KANNE

You have successfully made a payment of Rs. 2000.00 for your order on NITTTR CHENNAI using Atom Gateway. The Atom Transaction Reference No. for this payment is 300093611662 (details annexed below).

Transaction Details

Merchant Name: NITTTR CHENNAI	
Merchant Site: nittt.ac.in	
The charge will appear on your credit card / Account statement as NITTTR CHENNAI	
Transaction Date & Time	30-07-2020 10:58:48 AM
Merchant Transaction Reference No.	2020KA34518S
Atom Transaction Reference No.	300093611662
Payment Mode	Debit Card
Card Brand	
Amount	2000.00
Customer Name	KANNE
Customer Email Id	giri4893@gmail.com
Transaction Status	Success

For any queries, Please contact the merchant NITTTR CHENNAI

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Merchant Site: nittt.ac.in	
The charge will appear on your credit card / Account statement as NITTTR CHENNAI	
Transaction Date & Time	30-07-2020 11:05:04 AM
Merchant Transaction Reference No.	2020KA34524S

Atom Transaction Reference No.	300093613324
Payment Mode	Debit Card
Card Brand	
Amount	1000.00
Customer Name	KANNE
Customer Email Id	giri4893@gmail.com
Transaction Status	Success

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divya ammu <divyaammu82@gmail.com>

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admin@atomtech.in <admin@atomtech.in>
To: divyaammu82@gmail.com

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Transaction Details

Merchant Name: NITTTR CHENNAI	
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The charge will appear on your credit card / Account statement as NITTTR CHENNAI	
Transaction Date & Time	30-07-2020 15:03:23 PM
Merchant Transaction Reference No.	2020KA34706S
Atom Transaction Reference No.	300093683221
Payment Mode	Debit Card
Card Brand	
Amount	2000.00
Customer Name	DIVYA
Customer Email Id	divyaammu82@gmail.com
Transaction Status	Success

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Transaction Details

Merchant Name: NITTTR CHENNAI	
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The charge will appear on your credit card / Account statement as NITTTR CHENNAI	
Transaction Date & Time	30-07-2020 15:08:25 PM
Merchant Transaction Reference No.	2020KA34711S

Atom Transaction Reference No.	300093684685
Payment Mode	Debit Card
Card Brand	
Amount	1000.00
Customer Name	DIVYA
Customer Email Id	divyaammu82@gmail.com
Transaction Status	Success

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in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

Prof. Shubhangi D. C.
Programme Coordinator, Dept. of CSE
VTU's CPGS, Kalaburagi

Prof. S. A. Angadi
Chairperson, Dept. of CSE
VTU's CPGS, Belagavi

Prof. Vrijendra Singh
Head, Dept. of IT
IIT, Allahabad

Prof. Baswaraj Gadgay
Regional Director (I/c)
VTU's Regional Office, Kalaburagi



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Centre for Postgraduate Studies and Regional Office, Kalaburagi

and

Indian Institute of Information Technology, Allahabad

Devghat, Jhalwa, Prayagraj, Uttar Pradesh



Certificate

This is to certify that Mr. Sreenivasa M from

Ballari Institute of Technology and Management's has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Programme Coordinator, Dept. of CSE
VTU's CPGS, Kalaburagi

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Chairperson, Dept. of CSE
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Regional Director (I/c)
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Certificate

This is to certify that **Mr. HARI KRISHNA H** from

BITM

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Programme Coordinator, Dept. of CSE
VTU's CPGS, Kalaburagi

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Certificate

This is to certify that **Dr. R N Kulkarni** from

Ballari Institute of Technology and Management, Ballari has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

Prof. Shubhangi D. C.
Programme Coordinator, Dept. of CSE
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Certificate

This is to certify that **Dr. B M Vidyavathi** from

Ballari Institute of Technology & Management, Ballari has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Programme Coordinator, Dept. of CSE
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Chairperson, Dept. of CSE
VTU's CPGS, Belagavi

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Head, Dept. of IT
IIIT, Allahabad

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Regional Director (I/c)
VTU's Regional Office, Kalaburagi



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Certificate

This is to certify that **Dr. Dr.rajashree V Biradar** from

Ballari Institute of Technology and Management has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Regional Director (I/c)
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Certificate

This is to certify that Mr. KIRAN MUDARADDI from

Ballaro Institute of Technology and Management Ballari has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Certificate

This is to certify that **Mr. Girish Kumar D** from

Ballari Institute of Technology & Management has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Certificate

This is to certify that Mr. P PANI RAMA PRASAD from

B.I.T.M, BALLARI

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Indian Institute of Information Technology, Allahabad

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Certificate

This is to certify that **Mr. SUDHAKAR AVAREDDY** from

BITM

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Programme Coordinator, Dept. of CSE
VTU's CPGS, Kalaburagi

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Certificate

This is to certify that Mr. HAYATH T M from

BITM BALLARI

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

Prof. Shubhangi D. C.
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VTU's CPGS, Kalaburagi

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Certificate

This is to certify that **Mr. Jagadish R M** from

BITM, Ballari

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Certificate

This is to certify that **Prof. Aishwarya R Nayaka** from

BITM

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Certificate

This is to certify that Mr. BIMANNA ALALADINNI from

Ballari Institute of Technology & Management has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Certificate

This is to certify that **Ms. Jagadevi Puranikmath** from

BITM Ballari

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Devghat, Jhalwa, Prayagraj, Uttar Pradesh



Certificate

This is to certify that **Mr. Dadapeer** _____ from

Ballari Institute of Technology and Management _____ has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

Prof. Shubhangi D. C.
Programme Coordinator, Dept. of CSE
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IIT, Allahabad

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Certificate

This is to certify that **Ms. Pooja Kulkarni** from

BITM, Ballari

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

Prof. Shubhangi D. C.
Programme Coordinator, Dept. of CSE
VTU's CPGS, Kalaburagi

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Devghat, Jhalwa, Prayagraj, Uttar Pradesh



Certificate

This is to certify that **Mr. Srisailanath** _____ from

Ballari Institute of Technology and Management _____ has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

Prof. Shubhangi D. C.
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Certificate

This is to certify that **Prof. Tejashwini SG** from

BITM

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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Certificate

This is to certify that **Ms. Anita S Patil** from

BITM

has participated

in one week online FDP on "Exemplary Practices in Teaching - Learning and Evaluation of Courses in Computer Science & Information Technology", jointly organised by Visvesvaraya Technological University's Centre for Postgraduate Studies, Kalaburagi and Indian Institute of Information Technology, Allahabad from August 3-7, 2020.

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E-mail : Chennai-patent@nic.in
Web Site : www.ipindia.gov.in



CHALLAN : TR-5
DOCKET NO:4907

Date/Time : 19/01/2021

To,
Dr. NASEERUDDIN

Agent Number:

ASSOC.PROFESSOR, DEPT. OF ECE, BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT, BALLARI
583104 naseeruddin@bitm.edu.in

Sr. No.	CBR No.	Reference Number / Application Type	Application Number	Title/Remarks	Amount Paid
1	2050	ORDINARY APPLICATION	202141002336	METHOD BASED ON CONSTRAINT PRIORITIZED ROUTING IN WIRELESS MANETS	1750
2		E-101/500/2021-CHE	202141002336	Correspondence	0
3		E-2/189/2021-CHE	202141002336	Form2	0
4		E-5/247/2021-CHE	202141002336	Form5	0
5	2050	E-Misc/11/2021-CHE		EXCESS FEE	10
Total :					1760

Received a sum of Rs. 1760 (Rupees One Thousand Seven Hundred & Sixty only) through

Payment Mode	Bank Name	Cheque/Draft Number	Cheque/Draft Date	Amount in Rs
Draft	Pragathi Krishna Gramin Bank	269529	13/01/2021	1760

Note: This is electronically generated receipt hence no signature required.

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CHALLAN : TR-5
DOCKET NO:5836

Date/Time : 21/01/2021

To,
DR. ABDUL KHADAR A

Agent Number:

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING, BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT, HOSPETE ROAD, ALLIPUR, BALLARI - 583104, KARNATAKA, INDIA. abdulkhadar@bitm.edu.in

Sr. No.	CBR No.	Reference Number /Application Type	Application Number	Title/Remarks	Amount Paid
1	2418	ORDINARY APPLICATION	202141002871	THE EFFICIENT ENERGY CONTROL STRATEGIES IN SMART METER SYSTEM	1750
2		E-101/528/2021-CHE	202141002871	Correspondence	0
3		E-2/224/2021-CHE	202141002871	Form2	0
4		E-3/2782/2021-CHE	202141002871	Form3	0
5		E-5/285/2021-CHE	202141002871	Form5	0
6	2418	E-Misc/14/2021-CHE	tmp/1/CHE/2020	EXCESS FEE FOR NEW APPLICATION	10
Total :					1760

Received a sum of Rs. 1760 (Rupees One Thousand Seven Hundred & Sixty only) through

Payment Mode	Bank Name	Cheque/Draft Number	Cheque/Draft Date	Amount in Rs
Draft	PRAGATHI GRAMIN BANK	269528	13/01/2021	1760

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GOVERNMENT OF INDIA



CHALLAN : TR-5
DOCKET NO :4964

Date/Time : 19/01/2021 12:01:41

To,
Dr RAGHAVENDRA JOSHI
PROFESSOR, DEPT OF MECHANICAL ENGINEERING, BITM, BALLARI - 583104. achyut61@gmail.com

Agent Number:

Sr. No.	CBR No.	Reference Number / Application Type	Application Number	Title, Remarks	Amount Paid
1	2073	ORDINARY APPLICATION	202141002352	MAGNETOSTRICTIVE ACTUATOR WITH COAXIAL COILS FOR BRAKE ACTUATION MECHANISM	1750
2		E-101/510/2021-CHE	202141002352	Correspondence	0
3		E-2/198/2021-CHE	202141002352	Form2	0
4		E-3/2475/2021-CHE	202141002352	Form3	0
5		E-5/256/2021-CHE	202141002352	Form5	0
6	2073	E-Misc/13/2021-CHE		EXCESS FEE	10
Total					1760

Received a sum of Rs 1760 (Rupees One Thousand Seven Hundred & Sixty only) through

Payment Mode	Bank Name	Cheque / Draft Number	Cheque / Draft Date	Amount in Rs
Draft	Pragathi Krishna Gramin Bank	269526	13/01/2021	1760

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E-mail : Chennai-patent@nic.in
Web Site : www.ipindia.gov.in



CHALLAN : TR-5
DOCKET NO:4960

Date/Time : 19/01/2021

To,
Dr. R.N. KULKARNI

Agent Number:

PROFESSOR & HEAD, DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING, BALLARI INSTITUTE OF
TECHNOLOGY & MANAGEMENT HOSPETE ROAD, BALLARI, KARNATAKA, INDIA 583104.
rnkulkarni@bitm.edu.in

Sr. No.	CBR No.	Reference Number / Application Type	Application Number	Title/Remarks	Amount Paid
1	2072	ORDINARY APPLICATION	202141002350	AN AMELIORATED METHODOLOGY TO ABSTRACT SPECIFICATION FROM THE USECASE	1750
2		E-101/509/2021-CHE	202141002350	Correspondence	0
3		E-2/197/2021-CHE	202141002350	Form2	0
4		E-5/254/2021-CHE	202141002350	Form5	0
5	2072	E-Misc/12/2021-CHE		EXCESS FEE	10
Total :					1760

Received a sum of Rs. 1760 (Rupees One Thousand Seven Hundred & Sixty only) through

Payment Mode	Bank Name	Cheque/Draft Number	Cheque/Draft Date	Amount in Rs
Draft	Pragathi Krishna Gramin Bank	269527	13/01/2021	1760

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Principal
Ballari Institute of Technology & Management
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