पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
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THE PATENT OFFICE

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पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :30/10/2021

(21) Application No.202141049828 A
(43) Publication Date : 12/11/2021

(54) Title of the invention : HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM

(51) International classification :C08G0018760000, G02B0021020000, B41J0007020000, C08B0037000000, C08G0018480000
(86) International Application No :NA
Filing Date :NA
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(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

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3)Dr. K.SARGUNAN
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5)Mr. PRASHANTH MIRYALA
6)Dr. ASHOK KUMAR SULUGURU
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8)Mr. VEMPATI RAVINDRA
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(57) Abstract :
ABSTRACT HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM An assessment to confirm the impact of the epoxy sap type in the toughness of built up cement footers reinforced with carbon-fiber-built up polymer was acted to survey, which is more effective. The presentation of these examples was surveyed by assessing the flexural limit and burden avoidance connections of the shafts in the wake of setting them in various conditions, straightforwardly or in a roundabout way, with reenacted field conditions for a predetermined timeframe. The examples were presented to four natural conditions: a controlled lab climate, outside climate (direct openness to handle conditions), wet–dry in typical water climate and wet–dry saline (sodium chloride) water climate. The examples of various wet–dry conditions presented to a period pattern of about fourteen days inside the arrangement and fourteen days outside the arrangement. The tests were completed after four and six long stretches of openness to various ecological conditions. An investigation of fluctuation performed with the aftereffects of the bar's break tests to survey the impact of the openness conditions and the epoxy tar type in the bar's break load.

No. of Pages : 17 No. of Claims : 7

Controller General of Patents, Designs & Trade Marks

सत्यमेव जयते

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

G.A.R.6
[See Rule 22(1)]
RECEIPT

Docket No 100491 **Date/Time 2021/10/30 17:10:23**

To
Dr. C. SELIN RAVI KUMAR, ASSOCIATE PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), DULAPALLY ROAD MAISAMMAGUDA POST VIA. KOMPALLY RANGAREDDY DT SECUNDERABAD, HYDERABAD, TELANGANA 500100, INDIA.

CBR Detail:

Sr. No.	Ref. No./Application No.	App. Number	Amount Paid	C.B.R. No.	Form Name	Remarks
1	TEMP/E1/56396/2021-CHE	202141049828	1600	40714	FORM 1	HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM
2	E12/4469/2021/CHE	202141049828	2500	40714	FORM 9	----

TransactionID	Payment Mode	Challan Identification Number	Amount Paid	Head of A/C No
N-0000874688	Online Bank Transfer	3010210011923	4100.00	1475001020000001

Total Amount : ₹ 4100

Amount in Words: Four Thousand One Hundred Only

Received from Saurabh Kumar Jain the sum of ₹ 4100 on account of Payment of fee for above mentioned Application/Forms.

* This is a computer generated receipt, hence no signature required.

Print

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“FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 APPLICATION FOR GRANT OF PATENT (See section 7, 54 and 135 and sub-rule (1) of rule 20	(FOR OFFICE USE ONLY)

Application No.	
Filing date:	
Amount of Fee paid:	
CBR No:	
Signature:	

1. APPLICANT’S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)	

2. TYPE OF APPLICATION [Please tick ( ) at the appropriate category

Ordinary (√)		Convention (x)	PCT-NP (x)		
Divisional ()	Patent of Addition ( )	Division ( )	Patent of addition ()	Division ( )	Patent of Addition ( )

3A. APPLICANT(S)

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Dr. C.M. VIVEK VARDHAN	INDIAN	INDIA	House No.	PROFESSOR DEPARTMENT OF CIVIL ENGINEERING MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
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			City	HYDERABAD
			State	TELANGANA
			Country	INDIA
			Pin code	500100

Natural Person (√)	Other than natural Person		
	Small Entity (x)	Startup (x)	Others (x)

4. INVENTOR(S) [Please tick at the appropriate category]		
Are all the inventor(s) same as the applicant(s) named above?	Yes (√)	
If "No", furnish the details of the inventor(s)		

5. TITLE OF THE INVENTION

HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM

6. AUTHORISED REGISTERED PATENT AGENT	IN/PA No.	- NA-
	Name	
7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA	Name	Dr. C. SELIN RAVI KUMAR
	Postal Address	ASSOCIATE PROFESSOR DEPARTMENT OF CIVIL ENGINEERING MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS) DULAPALLY ROAD MAISAMMAGUDA POST VIA. KOMPALLY RANGAREDDY DT SECUNDERABAD, HYDERABAD, TELANGANA 500100
	Telephone No.	
	Mobile No.	9840202071
	Fax No.	
	E-mail ID	dr.selinravikunar@gmail.com

8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION

Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in the convention country)
NA	NA	NA	NA	NA	NA

9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)

International application number	International filing date
NA	NA

10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION

Original (first) application No.	Date of filing of original (first) application
NA	NA

11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT : NA

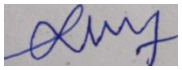
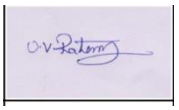
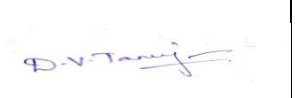
Main application/patent No. : NA	Date of filing of main application : NA

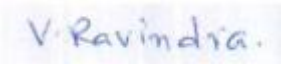
12. DECLARATIONS

(i) Declaration by the inventor(s)

(In case the applicant is an assignee: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period).

We, the above named inventor(s) are the true & first inventor(s) for this Invention and declare that the applicant(s) herein are our assignee or legal representative.

NAME	SIGNATURE	DATE
Dr. C. SELIN RAVI KUMAR		28/10/2021
Dr. VENKATA RATHNAM UKKURTHI		28/10/2021
Dr. K.SARGUNAN		28/10/2021
Ms. D.V.TANUJA		28/10/2021

Mr. PRASHANTH MIRYALA		28/10/2021
Dr. ASHOK KUMAR SULUGURU		28/10/2021
Mr. AKOJU RAMU		28/10/2021
Mr. VEMPATI RAVINDRA		28/10/2021
Mr. AKELLA NAGASAIBABA		28/10/2021
Dr. C.M. VIVEK VARDHAN		28/10/2021

(ii) Declaration by the applicant(s) in the convention country

(In case the applicant in India is different than the applicant in the convention country: the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period)

We, the applicant(s) in the convention country declare that the applicant(s) herein are our assignee or legal representative.

(a) Date
(b) Signature(s) -------NA----------
(c) Name(s) of the signatory

(iii) Declaration by the applicant(s)

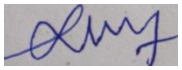
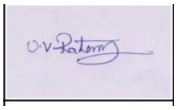
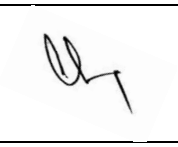
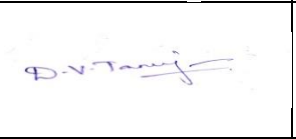
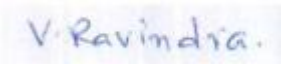
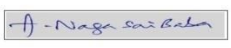
- We the applicant(s) hereby declare(s) that: -
- We are in possession of the above-mentioned invention.
- The ~~provisional~~/complete specification relating to the invention is filed with this application.
- ~~The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.~~
- There is no lawful ground of objection(s) to the grant of the Patent to me/us.
- We are the true & first inventor(s).
- We are the assignee or legal representative of true & first inventor(s).
- ~~The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of our invention(s).~~
- ~~We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.~~
- ~~Our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.~~
- ~~The application is divided out of my /our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.~~
- ~~The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.~~

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION (a) Form 2

Item	Details	Fee	Remarks
Complete specification	No. of pages :15		
No. of Claim(s)	No. of claims : 07 and No. of pages :01		
Abstract	No. of pages :01		
No. of Drawing(s)	No. of drawings :-- and No. of pages:--		

~~# In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned here.~~

~~(b) Complete specification (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).~~
~~(c) Sequence listing in electronic form~~
~~(d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).~~
~~(e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.~~
~~(f) Translation of priority document/Specification/International Search Report/InternationalPreliminary Report on Patentability.~~
(g) Statement and Undertaking on Form 3
(h) Declaration of Inventorship on Form 5
(j)……..
Total fee
We hereby declare that to the best of our knowledge, information and belief the fact and matters slated herein are correct and We request that a patent may be granted to us for the said invention.

NAME	SIGNATURE	DATE
Dr. C. SELIN RAVI KUMAR		28/10/2021
Dr. VENKATA RATHNAM UKKURTHI		28/10/2021
Dr. K.SARGUNAN		28/10/2021
Ms. D.V.TANUJA		28/10/2021
Mr. PRASHANTH MIRYALA		28/10/2021
Dr. ASHOK KUMAR SULUGURU		28/10/2021
Mr. AKOJU RAMU		28/10/2021
Mr. VEMPATI RAVINDRA		28/10/2021
Mr. AKELLA NAGASAIBABA		28/10/2021
Dr. C.M. VIVEK VARDHAN		28/10/2021

To,
The Controller of patents, The Patent office at CHENNAI.

Form 2

THE PATENT ACT, 1970

(39 of 1970)

&

The Patent Rules, 2003

COMPLETE SPECIFICATION

(Section 10 and Rule 13)

HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM

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The following specification particularly describes the invention and the manner in which it is to be performed.

FIELD OF THE INVENTION: CIVIL ENGINEERING

This invention relates to novel methods of making an epoxy beams bound with carbon fibre-reinforced polymer based system.

PRIOR ART SEARCH

Carbon fiber supported polymer (CFRP) composite, additionally know essentially as "composite", isn't without a doubt, extremely amazing however light weight too. Ordinarily, layers of woven or non-woven texture of carbon strands are put in a grid of a polymer like epoxy, polyester, polyamide, or polyvinyl. In such manner, composites are like the broadly utilized fiberglass supported polymer. Composites are turning into the material of decision for airplane, elite execution auto applications, machine parts, and sporting equipment. As the general expense of composites drops with the improvement of more productive assembling methods, we will, almost certainly, see a more noteworthy utilization of composites in future.

US8187703B2: The current creation is coordinated to strategies for incorporating carbon nanotubes into epoxy polymer composites through substance functionalization of carbon nanotubes, and to the carbon nanotube-epoxy polymer composites delivered by such techniques. Mix is upgraded through further developed scattering and additionally covalent holding with the epoxy framework during the relieving system. As a rule, such techniques include the connection of substance moieties (i.e., practical gatherings) to the sidewall as well as end-cap of carbon nanotubes to such an extent that the compound moieties respond with either the epoxy

precursor(s) or the relieving agent(s) (or both) during the restoring system. Furthermore, in certain epitomes, these or extra compound moieties can capacity to work with scattering of the carbon nanotubes by diminishing the van der Waals alluring powers between the nanotubes.

US8329272B2: The current innovation is a primary shaft having something like one composite center inside an empty light emission or polymeric material, for example deeply and the internal dividers of the metal or polymeric coat. This underlying shaft additionally might be fitted with sections or openings at its closures and focuses along its length to permit connection to other primary components. Profoundly and the metal or polymeric coat, and is especially valuable where a high solidarity to weight proportion is required.

EP2666807A2: The carbon fiber supported composite material is for the most part an inhomogeneous material acquired by embellishment a prepreg of which fundamental establishing components are a carbon fiber which is a building up fiber and a lattice tar, and in like manner, there is a major contrast between actual properties of orchestrating heading of the supporting fiber and actual properties of other bearing. For instance, it is realized that an effect obstruction communicated by a protection from drop sway is, since it is controlled by delamination strength which is quantitatively estimated as interlayer edge strip strength, not brought about a radical improvement exclusively by expanding strength of the supporting fiber. Specifically, carbon fiber built up composite materials of which framework gum is a thermosetting gum has, in impression of a low strength of the network tar, a property to be broken effectively by a pressure from other than the masterminding bearing of the supporting fiber. As needs be, different means

are proposed to work on actual properties of composite material fit for opposing to the pressure from other than the organizing bearing of the building up fiber.

US20060283133A1: A specifically supported mixture metal-composite underlying component can incorporate a metal component and a composite material. The composite material can be attached to the metal component by a cement layer including a polymer framework utilizing a radiation relieving process, bringing about meager or insignificant lingering stresses at the bond line between the metal component and the composite component. The underlying component additionally can incorporate a metal closeout cap to give a boundary from a destructive environment, and the glue layer can typify the composite component to give a consumption safe hindrance between the composite component and the encompassing metal.

US7128094B2: The current development is a blast framework involving a first blast area having a distal end and a proximal end. A subsequent blast segment incorporates a distal end and a proximal end, wherein the proximal finish of the subsequent blast area is rotatably coupled to the distal finish of the main blast segment. Something like one of the blast segments is generously shaped from composite materials.

US8656685B2: The current innovation gives a strategy for working on the malleability of an underlying part, like a supported cement footer or segment, by giving a locale of expanded pressure yielding in the pressure zone of the plastic pivot area or close by. This can be accomplished by utilizing malleable compressive material in the pressure zone, or by shaping a component gave in the pressure zone to give the flexible pressure zone.

Profoundly, and a supporting construction situated inside the non-metallic center for expanding the underlying limit of the metal-plated part. Profoundly.

WO2010022204A2: The current creation is an underlying pillar having no less than one composite center inside an empty light emission or polymeric material, for example deeply and the internal dividers of the metal or polymeric coat. This underlying bar likewise might be fitted with sections or openings at its finishes and focuses along its length to permit connection to other primary components. Deeply and the metal or polymeric coat, and is especially valuable where a high solidarity to weight proportion is required.

Lately, polite architects have progressively utilized CFRP as a way to build up cement, wood, and metal primary components. See for instance, Buell, et al., Journal of Structural Engineering, vol. 131 , No. 1 , pp 173 - 187 (2005) and US Patent 7,100,336 gave Sep, 6, 2006. At present, composite underlying bars are accessible in the different shapes that copy metal pillars.

While the strength and light weight of composite pillars are appealing, interfacing such composite shafts both with other composite components and with metal components is risky. They can not be welded like metal shafts and shooting or riveting can prompt pressure breaks, which along these lines lead to disappointment of the pillar. Exceptional fittings can be utilized to join composite components, yet require extraordinary strategies, with which development laborers are regularly not comfortable, consequently easing back get together. Further, uncovered composite bars are regularly liable to cuts and scraped area, especially during development, prompting future disappointment of the bar. Composite bars debase when presented to bright

light, so they should be protected from direct daylight. Since composite and metal underlying components have very various coefficients of warm extension, such contrasts should be obliged at whatever point metal and composite materials are coupled.

Ideally, the carbon fiber composite center is contained at least one unidirectional or bidirectional direct carbon fiber bunches set in a first polymeric material to shape a carbon fiber composite framework. The coat is made out of a metallic or polymeric material, other than a carbon fiber composite material, that can be fitted with at least one method for connection to other primary components.

NON-PATENT LITERATURE STUDY

1. Baldan A (2004) Adhesively bonded joints and repairs in metallic alloys, polymers and composite materials: Adhesives, adhesion theories and surface pretreatment. Journal of Materials Science 39(1): 1–49.
2. Mukherjee A and Arwikar S (2007) Performance of externally bonded GFRP sheets on concrete in tropical environments. Part II: Microstructural tests. Composite Structures 81(1): 33-40.
3. Li L, Guo Y, Liu F and Bungey J (2006) An experimental and numerical study of the effect of thickness and length of CFRP on performance of repaired reinforced concrete beams. Construction and Building Materials 20(10): 901–909.
4. Andrade JJO (2012) Influence of epoxy beams strengthened with carbon fibre-reinforced polymer. ICE Proceedings Structures and Buildings. http://dx.doi.org/10.1680/stbu.11.00081.

PROBLEM STATEMENT

Epoxies and polyesters were frequently castoff as a composite matrix owed to their fibre protection assets [1]. Polyester resins usually not very resistant to alkalis were classically avoided for concrete usage. Vinyl ester resins are resilient to an extensive series of acids (hydrochloric, sulfuric, hydrofluoric, nitric, and phosphoric), as well as to chloride salts and chlorine, making them ideal for marine environments [2]. Thusly, natural conditions ought to be taken into consideration while dissecting the presentation of carbon-fiber-reinforced components and their specific properties were schematically represented (**figure.1**). Assessing the mechanical properties under lab conditions gives a sign of the material conduct for near purposes, considering that in commonsense conditions, the component is exposed to a few sorts of environmental activities [3]. This work means to add to this space of information to give the specialized local area with pertinent data about the conduct of carbon fiber support when exposed to an assortment of openness conditions, considering the uniqueness of the pitch types utilized [4].

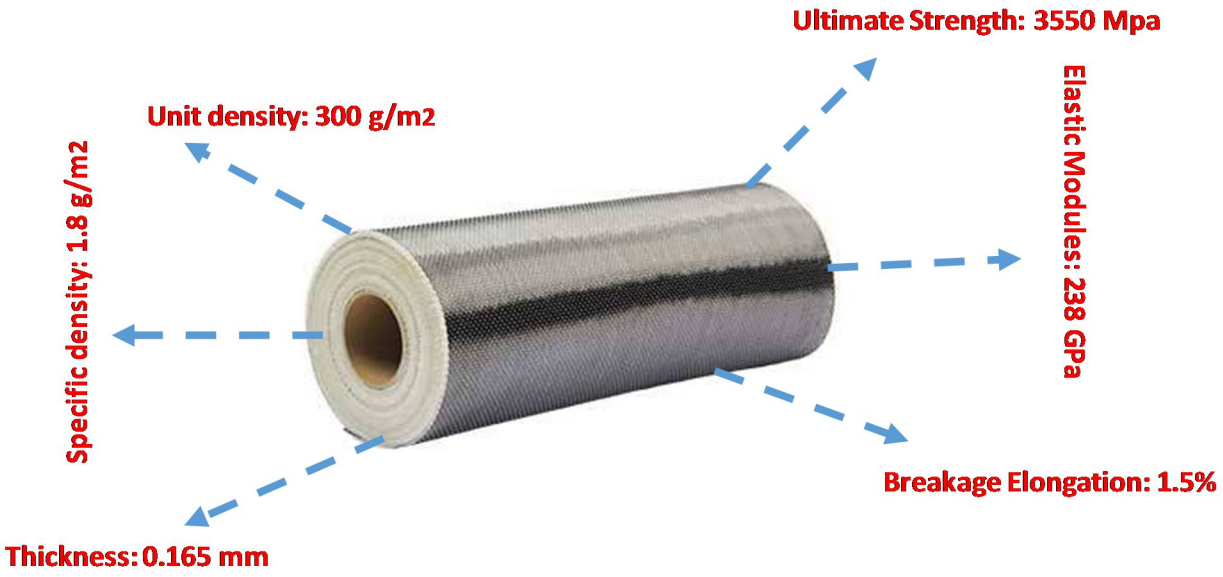


Figure. 1. Carbon Fibre property.

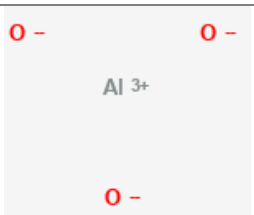
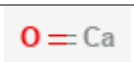
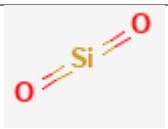
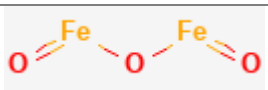
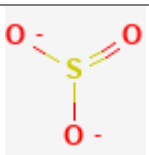
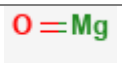
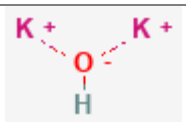
RESEARCH METHODOLOGY

MATERIALS

Cement

Portland Slag Cement (PSC) was utilized, owed to its huge obtainability in India's metropolitan region and their chemical property was displayed (**Table. 1**).

Table. 1 Chemical properties along with their chemical structure and total value (%) of Portland Slag Cement (PSC).

S. NO.	Chemicals	Structure	Value (%)
1.	Aluminum oxide		12
2.	Calcium oxide		46.2
3.	Silicon dioxide		32.3
4.	Ferric Oxide		3.8
5.	Sulfite		2.88
6.	Magnesium oxide		6.1
7.	Potassium oxide		1.1
8.	Sodium oxide		0.18
9.	Loss of Ignition	-	4.32
10.	Insoluble Residues	-	36.32

Composite System

The proposed composite system consists of carbon fibre and their natural characteristic feature was displayed (Figure. 1). Followed by, polyamine epoxy-based primer without addition of any solvents was utilized, with prominent probing power along with short viscosity. The specific density of primer is 1.05 kg/dm^3 followed by 5-6 hrs. of drying time to touch, and holding 0.217 mm/mm breakage elongation. In addition, a smoothing mortar was utilized in edict to reduce any indiscretions on the surface of beam. Finally, two different types of epoxy resin was used for this present research (ER-I and ER-II) and their properties were displayed (Figure. 2).

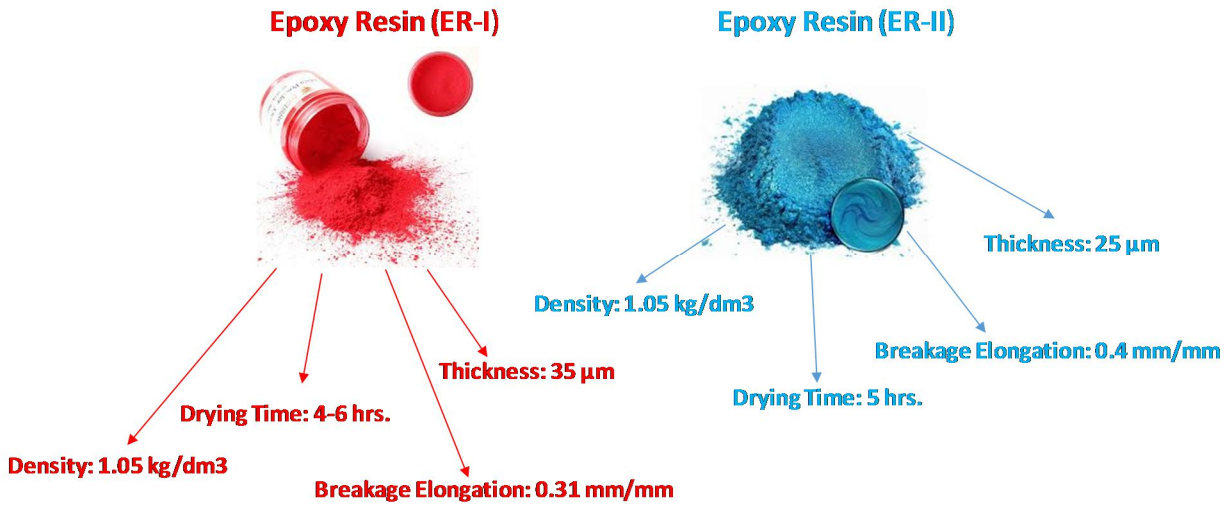


Figure. 2. Physical properties of Epoxy resin (ER-I and ER-II).

METHODS

The laboratory contact specimens were separated into three groups. In a laboratory, control (without exposure to beams) three beams were reserved without CFRP – these were measured as locus specimens – and six beams holding CFRP (3 beams with epoxy E1 and 3 beams with epoxy E2). This conformation was comparable to the added two groups (wet-dry normal water specimens along with wet-dry saline (sodium chloride solution) water specimens. The different

beams of wet–dry settings were open to a series of 2 weeks intimate the solution and 2 weeks external to the solution; for individual group the beams were experienced in flexure of four and eight months.

Statistical value from the experiments were subjected to analysis of variance (ANOVA of arcsine, logarithmic and square root transformed percentages). Differences between the treatments were determined by Tukey's Kramer HSD test (P=0.05) (Snedecor and Cochran, 1989). Statistical differences between each experiment were analyzed by Tukey's multiple range test (significance at $p < 0.05$) using Minitab®17 program and Microcal Software (Sigma plot 11) was used to plot the graph.

RESULTS

The present results illustrates that the E2 resin-reinforced beams displayed a more constant behavior design, reproducing gradual deboning of the reinforcement as compare to the E1 resin. Moreover, the break load's behavior for the established beams, compelling into justifying the exposure and age setting of the trial (**Figure. 3**). In addition, the reinforcement of the beams with E2 resin displayed upper resistance as compare to the E1 resin-reinforced for all the experience settings and test ages. It can be prominent that the exposed beams to wet-dry cycles desired a significant rupture load as compared to the exposed beams to the other settings at the age of four months (**Figure. 4**).

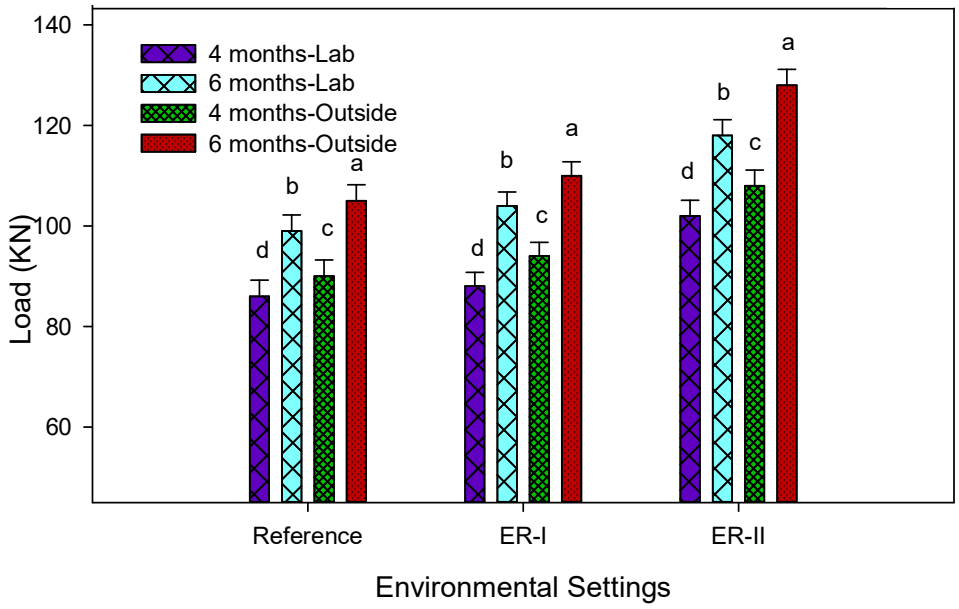


Figure. 3. Graph plots represents the maximum beam loads in different environmental conditions.

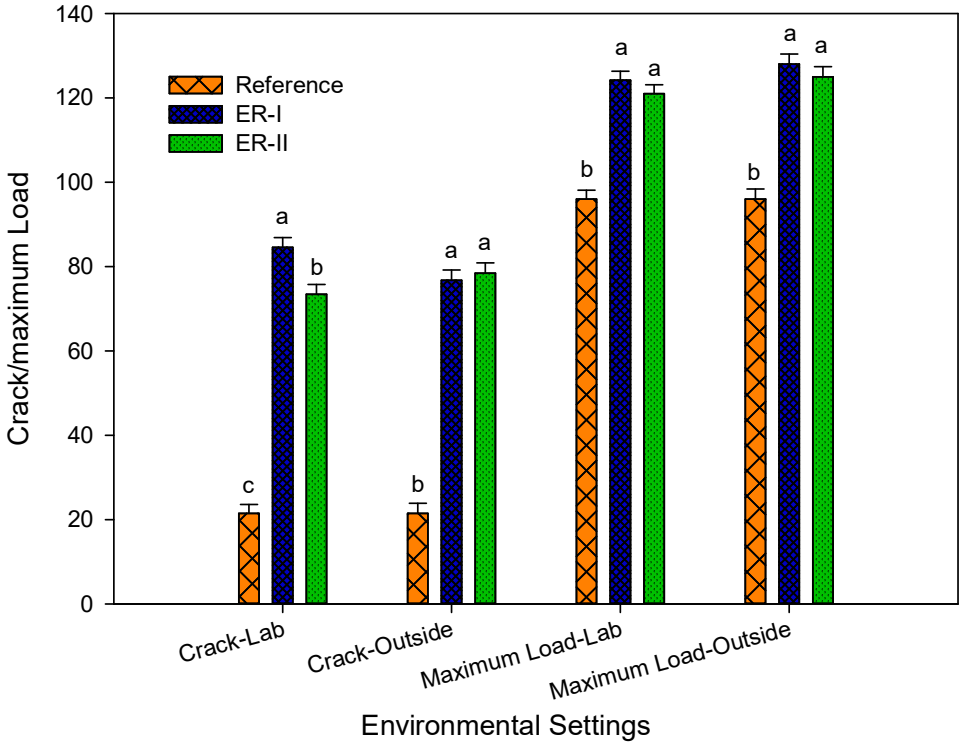


Figure. 4. Graph plot represents increase in the resistance for the formation of the first crack and the maximum load for the selected beams.

The current research investigates in this way addresses a valuable contribution to the information on materials choice of carbon fibre-reinforced polymer dependent on the reinforcement's administration life in known conditions, expanding the significance of life-cycle appraisal apparatuses to permit a superior materials choice. Despite the fact that the outcomes appear to be reliable, further examinations ought to be led, principally expanding the number of built up radiates and submitting them to the most forceful openness conditions conceivable.

The light emission development might be utilized in a way as light emissions craftsmanship, for example, in building development, structural designing undertaking, apparatus, airplane, vessels, and vehicles. Since the current bar's solidarity to estimate proportion is more prominent than steel or aluminum, it tends to be utilized in applications where strength is required, however there are imperatives on size or weight that would block light emissions or other conventional materials. Furthermore, certain encapsulations of the current creation, for example, those wherein the coat is treated steel, electrifies steel, or aluminum, might be utilized in serious climate conditions and surprisingly submerged. The current bar is especially helpful in aviation vehicles where strength is basic yet weight is a requirement.

CLAIM (S)

1. A Epoxy Beams comprising Carbon Fibre composite wherein, there are caps at each end of the core, and one or more collars attached to the core.
2. According to claim 1,wherein the carbon fiber composite core is comprised of unidirectional or bidirectional linear carbon fibers set in a first polymeric material to form a carbon fiber composite matrix.
3. According to claim 1,wherein the composite system consists of carbon fibre with polyamine epoxy-based primer without addition of any solvents was utilized, with prominent probing power along with short viscosity. The specific density of primer is 1.05 kg/dm3 followed by 5-6 hrs. of drying time to touch, and holding 0.217 mm/mm breakage elongation.
4. According to claim 1,wherein this addition, a smoothing mortar was utilized in edict to reduce any indiscretions on the surface of beam. Finally, two different types of epoxy resin was used for this present research (ER-I and ER-II)
5. According to claim 1,wherein the control (without exposure to beams) three beams were reserved without CFRP – these were measured as locus specimens – and six beams holding CFRP (3 beams with epoxy E1 and 3 beams with epoxy E2).
6. According to claim 1,wherein the the E2 resin-reinforced beams displayed a more constant behavior design, reproducing gradual deboning of the reinforcement as compare to the E1 resin.
7. According to claim 1,wherein the the reinforcement of the beams with E2 resin displayed upper resistance as compare to the E1 resin-reinforced for all the experience settings and test ages.

ABSTRACT

HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM

An assessment to confirm the impact of the epoxy sap type in the toughness of built up cement footers reinforced with carbon-fiber-built up polymer was acted to survey, which is more effective. The presentation of these examples was surveyed by assessing the flexural limit and burden avoidance connections of the shafts in the wake of setting them in various conditions, straightforwardly or in a roundabout way, with reenacted field conditions for a predetermined timeframe. The examples were presented to four natural conditions: a controlled lab climate, outside climate (direct openness to handle conditions), wet–dry in typical water climate and wet–dry saline (sodium chloride) water climate. The examples of various wet–dry conditions presented to a period pattern of about fourteen days inside the arrangement and fourteen days outside the arrangement. The tests were completed after four and six long stretches of openness to various ecological conditions. An investigation of fluctuation performed with the aftereffects of the bar's break tests to survey the impact of the openness conditions and the epoxy tar type in the bar's break load.

THE PATENTS ACT 1970
(39 of 1970)
&
The Patent Rules, 2003
STATEMENT AND UNDERTAKING UNDER SECTION 8
(See Section 8, rule 12)

NAME OF APPLICANTS& INVENTORS

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Hereby declare, We have not made any application for the same / substantially the same invention outside India.

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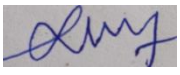
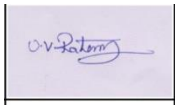
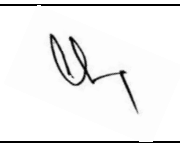
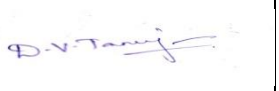
Dr. C. SELIN RAVI KUMAR		28/10/2021
Dr. VENKATA RATHNAM UKKURTHI		28/10/2021
Dr. K.SARGUNAN		28/10/2021

Ms. D.V.TANUJA		28/10/2021
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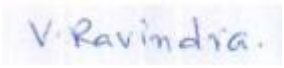
Mr. VEMPATI RAVINDRA		28/10/2021
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FORM 5
THE PATENTS ACT, 1970 (39 of 1970)
&
THE PATENTS RULES, 2003
DECLARATION AS TO INVENTORSHIP
(See section 8, rule 12)

1. Name of Applicant & Inventors

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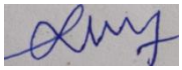
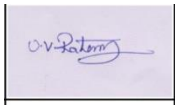
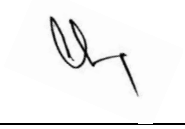
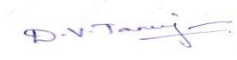
Hereby declare that the true and first inventor of the invention disclosed in the complete specification filed in pursuance of my application numbered _____ dated _____

TITLE OF THE INVENTION:

HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM

3.Declaration to be given when the application in India is filed by the Applicant in the convention country: -
I the applicant in the convention country hereby declare that our right to apply for a patent in India is by way or assignment from the true and first inventor.

NAME	SIGNATURE	DATE
Dr. C. SELIN RAVI KUMAR		28/10/2021
Dr. VENKATA RATHNAM UKKURTHI		28/10/2021
Dr. K.SARGUNAN		28/10/2021
Ms. D.V.TANUJA		28/10/2021
Mr. PRASHANTH MIRYALA		28/10/2021
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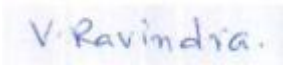
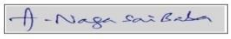
Mr. AKOJU RAMU		28/10/2021
Mr. VEMPATI RAVINDRA		28/10/2021
Mr. AKELLA NAGASAIBABA		28/10/2021
Dr. C.M. VIVEK VARDHAN		28/10/2021

To
The Controller of patents, The Patent office at CHENNAI.

FORM 9
THE PATENTS ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
REQUEST FOR PUBLICATION
(See section 11A(2); rule 24A)

We (state name, address and nationality of Applicant & Inventors)

TITLE OF THE INVENTION:
HIGH STRENGTH EPOXY BEAMS BOUND WITH CARBON FIBRE-REINFORCED POLYMER BASED SYSTEM

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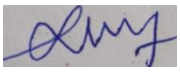
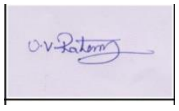
Hereby request for early Publication of our application for Patent No. _____ dated _____ under section 11A(2) of the act.

NAME	SIGNATURE	DATE
Dr. C. SELIN RAVI KUMAR		28/10/2021
Dr. VENKATA RATHNAM UKKURTHI		28/10/2021

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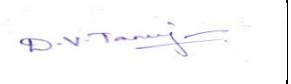
Ms. D.V.TANUJA		28/10/2021
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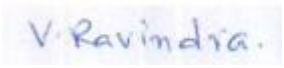
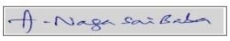
Mr. VEMPATI RAVINDRA		28/10/2021
Mr. AKELLA NAGASAIBABA		28/10/2021
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To
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