

## CO, CO<sub>2</sub>, NO<sub>x</sub>, METHANE GASEOUS SEQUESTRATION FROM NATURAL ADDITIVE LIME PANELS AND INCREASING HEAT INSULATION OF PANELS.

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### Abstract

Fascinating share from specific natural additives are used during the formation of constructions and paths. From them, hazardous gases are departing. These gases are crucial to the variance in the earth's atmosphere. Cannabis Sativa, gokshura are natural resources (carbon negative material) from the medieval period are using essentially like a cheap environmental bearing substance against numerous composite commodities. Within structures, this is frequently practiced, including a lime filler cover inside drywall structures. Some precise data ready to judge the atmosphere behavior of here kind of structure in India, UK. Here analysis strives to recognize the methods and supplies associated with the development of cannabis sativa, chrysopogen zizanoides walls blended with lime and strengthening their maturity classification impact upon climate alteration. This research obeys methods including guidelines regarding worldwide (ISO14040) and UK (PAS2050) measures. We will execute cannabis Sativa -lime drywall frame is 1m<sup>2</sup> in range, 315 millimeters including wood framing brace internally. The investigated parts of hempcrete consolidate characteristics of hemp appropriate to development, binder qualities, mechanical properties, sturdiness, and melting properties, natural qualifications, fabricating cycles, and current applications. A few exploration gaps concerning the hydraulic nature of the binder, strength, and sturdiness, and burning obstruction of hempcrete were verified. This was additionally settled that hempcrete has remarkably moderate embodied carbon, some other gases and encapsulated power, addressing it absolute for natural additive structure pertinence. The conclusion closes with a conversation illustrating the demand and aiming for future examination on enhancing the amount of CO<sub>2</sub> other greenhouse gaseous sequestration from natural additives while blending with lime and also to increase compressive strength of lime.

**keywords:** hempcrete, vetcrete, gokshura, greenhouse gaseous, indian kudzu.

### INTRODUCTION

Indian archaeologists discovered that hemp played a critical role in preserving the historic Ellora caverns. (olivier et al .2016) In 689 AD, the Sarthe waterway connect in France is built with over 10% hemp (jami et al.2016) (hempcrete) is another structure material made up of two main components: hemp shiv and lime-based fastener. Hemp shiv is a woody nature crushed and blended with lime particles. Different limes are used for initial setting of lime and final settling of lime (kenneth et al.2012). Its have good acoustic characteristics, great heat insulation

properties and particularly high environmental qualities (recyclable, high green house gaseous sequestration) [jami et al.2016] makes it an inexpensive option in contradiction to generally natural materials in the construction development industry (boutin et al.2005) . Because of its power-driven characteristics, hempcrete is not a useless material . It is allocated as a stuffing material for single-layer panels ,roof top panels,heat insulation panels(lawrence et al.2012)in room separation.Construction techniques include forming uniform walls by compacting the mix in aprecast blocks,precast panels[elfordy et al.2008].in the most contemporary decade, natural fiber is known as a support material in a lime composite. Natural fiber performs as a replacement to engineered or artificial fibre because of the natural solicitudes raised by the latter. A natural fibre -reinforced lime composite (NFRLC) is a composite material comprised of a framework blended in with natural crushed shiv for example,hemp,vetiver,gokshura,indian kudz[nguyen et al.2010]. These crushed natural additives are generally utilized as barriers in the NFRLC because of the way that they are low in density, great in manufacturing properties, and recyclable and have dazzling strength per weight materials[arnaud et al.2011] . Moreover, regular natural crushed additives are preferred over fabricated strands since they are abundant, sustainable, and biodegradable. [kioy et al.2013]

### NATURAL ADDITIVES AND THEIR USES

#### Lime

The pressure-driven characteristics examination according to IS 6932 (Pa - 1973(7th part) as per in IS: 712 - 1984. Nuclear Absorption Spectroscopy held managed to determine the aluminium trioxide,ferrous trioxide calcium, and magnesium were found by XRD, Silica was discovered by SEM analysis. The pressure-driven characteristics and lime index (LI) are concluded:

Water powered list (HI) = (aluminium trioxide + ferrous trioxide + silicon dioxide)/(calcium oxide + magnesium oxide) (1)

Cementation index(CI) = (1.15 aluminium trioxide + 0.75 ferrous trioxide + 2.8 silicon dioxide)/( calcium oxide + magnesium oxide ) (2)

The hydraulic index proof of lime by Taylor is

In the event that

0.33 < hydraulic index < 0.53 – free H<sub>2</sub>O powered lime

0.53 < hydraulic index < 0.73 – decent H<sub>2</sub>O powered

0.73 < hydraulic index < 1.13 – more highly H<sub>2</sub>O powered

Cementation index proof by Eckel is given by

Cementation index < 0.13 – air lime

0.13 < Cementation index < 0.33 – least H<sub>2</sub>O driven lime

0.33 < Cementation index < 0.53 – free H<sub>2</sub>O powered

0.53 < Cementation index < 0.73 – slightly H<sub>2</sub>O powered

0.73 < CI < 1.13 –, high water powered driven lime .

### **Mortar preparation**

Hydrated mortar lime penetrating through 0.85 micron sieve, was blended with spices extract insame ratio. Sand from highly graded used in the investigation(cerezo et al.2005). The lime to natural additives ratio was taken as 1:3 by mass as per Indian IS 712-1984. The lime was continuously mixed with an same amount of (water/natural spices extract) for 5 minutes, and theextracted binder was used for make the mortar. Then we will get plastic mix with natural spiceswater to binder ratio ) is adjusted as 0.66. The mortar was placed into cubes (50 mm × 50 mm × 50 mm)[9] and at environmental conditions  $27 \pm 2$  °C and 90 percent moisture. cubes were demoulded after 2 required days and placed at equal temperature for 30 days strength. Description of spices added lime mortar used in the study are given in The different type of lime mortars used are LH (lime + hemp), LHV (lime + hemp+vetiver), LHVG (lime + hemp+vetiver + gokshura), LW (lime + water)LHVI(lime+hemp+vetiver+Indian kudzu)

### **Hemp**

Hemp has located its use in approximately 25000 applications (Popular Mechanics, 1938) and has been in use on the grounds that as early as 9000BCE .it is one of the ancient cultivated vegetation. Interestingly, the U.S. independence declaration changed into written on a hemp paper. Some of the numerous products refined from hemp which have been perfected over time are as following:

1. Hemp seed food
2. Hempseed fit to be edible oil. (sumit kumar et al.2016)
- 3.Oil, resin and wax for commercial packages including lubricants.
- 4.Medicines for various pains and psychological ailments, as well as most cancers remedy
- 5.Personal care merchandise derived from hempseed oil
6. Textiles merchandise which include apparels and technical textiles,
7. Cordage
8. Biofuel with less pollutants.
9. Cellulose degradable plastics
10. natural Paper
11. Defence packages including bullet-evidence vests and bunkers.

### **Vetiver**

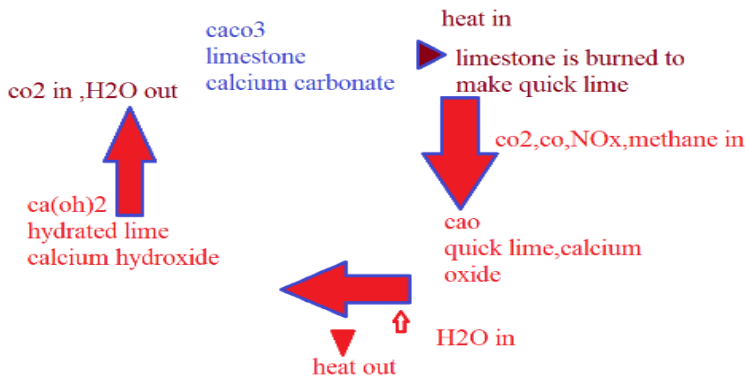
Vetiver grows in some parts of india, Pakistan, Nepal roots absorb more carbon dioxide from atmosphere and vetiver oil have so many medicinal values can be used as phase change material at high temperature on mohrs scale diamond shows value 10 and vetiver shows value 8.2 on mohrs scale[boutin et al.2006] ,vetiver oil used for knee joint pain relief and also for sleeping syndrome.

### **Gokshura**

Gokshura contains calcium oxalate crystals which increase compressive strength periodically like kadukkaiRatios of natural additives ,mortar and H<sub>2</sub>O(cripps et al.2004) (defra et al.2005)

Binder ratio	crushed additives ratio	Water ratio Binder ratio	
3.25		1.45	
Natural additive Wt (g)		Folio wt(g)	H2OWeight (g)
79		169	219

hemcrete ,veticrete lime binder cycle



### Characteristics of Hemp Applicable to Architecture

Hemp scientific name is cannabis sativa which grows in hilly shadow regions mostly in andhra pradesh araku region,tamilnadu coaimbatore region and in some parts of north india(ducket et al.2009) ,hemp can easily blended with lime and increases its flexural strength day by day when other organic additives(indian kudz,gokshura) are added to lime compressive strength and shear strength also increases .it have more heat insulation properties ,natural acoustic properties,good water absorption ratio,more green house gaseous sequestration.

### DISSECTION OF THE HEMP STRAW

The scientific name of hemp is Cannabis ruderalis(or) Cannabis indica L. it is comprised of 2 cell patrs: a woody region (core) and the exterior peel (cuticle)These cell zones comprise of the different films.The most frequently employed pieces of the stalks are the cuticle and phloemy layers [Edwards et al.2010]. The phloemyfilm takes part in a need of moving the natural additions from the photosynthesis addresses to different pieces of the plant. The fundamental filaments of the tree begin from the phloemy layer and are endless. The layers only adjoining the cambium parts are called discretionary threads(evrard .A et al.20100. Quintessential,subordinate filaments excluded from the tree and packaged mutually known as functional strands. The films beneath the cambium are significantly composed of stagnant cells, stored in an example that takes into account the moving of h2O and dissolvable ores. The Xylem cover remains authenticated by veins plus strands.

### Features of Hemp Concrete solids and boards:

Establish down through its identity of a character description and constituents, hemp solid facts uniquely in contrast to customary structure materials, for example ferroconcrete blocks, red blocks, cellulose concrete, (finnveden.G et al.2009)etc. A portion of the trademark qualities of hemp concrete are that it is carbon capture, less density, great dampness support ability, low warm conductivity, and acoustic protection(Gonzalez garacia et al.2010).

### **Density**

The utilization of hemp shive as the results implies an expanded getting the thickness of the resultant cement considering they are tinier than totals that originate from ores. Strangely, hempcrete, veticrete is a edifice component of which the thickness isn't continuously consistent and doesn't have a normal incentive with a little scattering, as other normalized materials like cement. One reason behind such enormous varieties in frequencies is that the volume of the item relies upon the volume arrangement of a composite.(Hammond.G et al 2011) This is not normal for traditional conventional Portland concrete solid where, regardless of the evaluation of concrete, the thickness quite often stays consistent at 2600+/- 50.5 kg/m<sup>3</sup> (Nevle et al 2009).

### **Compressive strength**

Hempcrete consists very less compressive strength when compared to cement cubes and blocks .previously scientists had done tests at 10%strain only they stop tests.if the cubes were made up of normal lime and hydrated calci lime (CL90S) ,hydrated calci lime showed high compressive strength than normal lime .if we use jaggery+kadukkai(jaggery fermentated for a period of 9 days the binder can increases its compressive strength,if we add corn powder lime compressive strength will increases.if lime blended with GGBS,metakoilin ,silica vapour, natural muds its compressive strength increases(karus.M et al.2003) ,if we add natural additives like corn ,gokshura,indian kudz compressive strength increases periodically(jami et al.2016).

### **Flexural strength**

Flexural strength is one of the mechanical property to oppose bending stresses, the hempcrete have flexural strength 0.30Mpa to 0.9 Mpa(sassoni 2014).formaldehyde also introduced to increase flexural strength of hempcrete(Mohammadi.a et al 2010) .if it consists more natural additives like hemp, vetiver, gokshura , indian kudz due to more fiborous material flexural strength will increases.

### **Acoustic properties:**

Hempcrete is additionally known to acoustic protection have better stable ingestion abilities.if we use hydrated lime or lime pozzolona binders then hemp panels can increase more acoustic properties. [jami et al.2016] they were ready to exploration that actual boundaries like porosity and thickness does not influence acoustic retention.

### **Fire resistance**

Hempcrete with density low thickness 340kg/meter cube and medium thickness 640kg/ meter cube fire test was done by EN 13823 and Id tests[jami et al.2016] it shows class c fire protection (sassoni et al .,2014).

### **Durability**

Natural additive materials are needed to have satisfactory solidness to guarantee the life span of the structure with less cost(nortan.A et al 2009). Different examinations have been directed to analyze hemp solid's solidness beyond different boundaries had contemplated the engineering characteristics and sturdiness of hempcrete,veticrete blocks of different blends[mussati.M.C et al.2012], with fasteners made out of gokshura,Indian kudzu, and business fasteners. The solidness boundaries analyzed were:

1. protection from defrost,
2. protection from sodium chloride openness, and

3. protection from natural disintegration.

### Environmental credentials

The wooden part of the material, hemp shive, consists 48% carbon which is an immediate after effect of the climatic carbon dioxide through photosynthesis. (Jamiii and Kumari, 2017) among them valuation had recorded the absolute carbon capturing of hemp cement to be 308..26 kilograms of carbon dioxide /metre cube (baven and wooley 2008) explored that 1 metre cune solid cannabis cube absorb more than 100 kg of CO<sub>2</sub>. (printerweg et al.2009)

## CHARACTERISATION

### AVL 5 gas analyzer

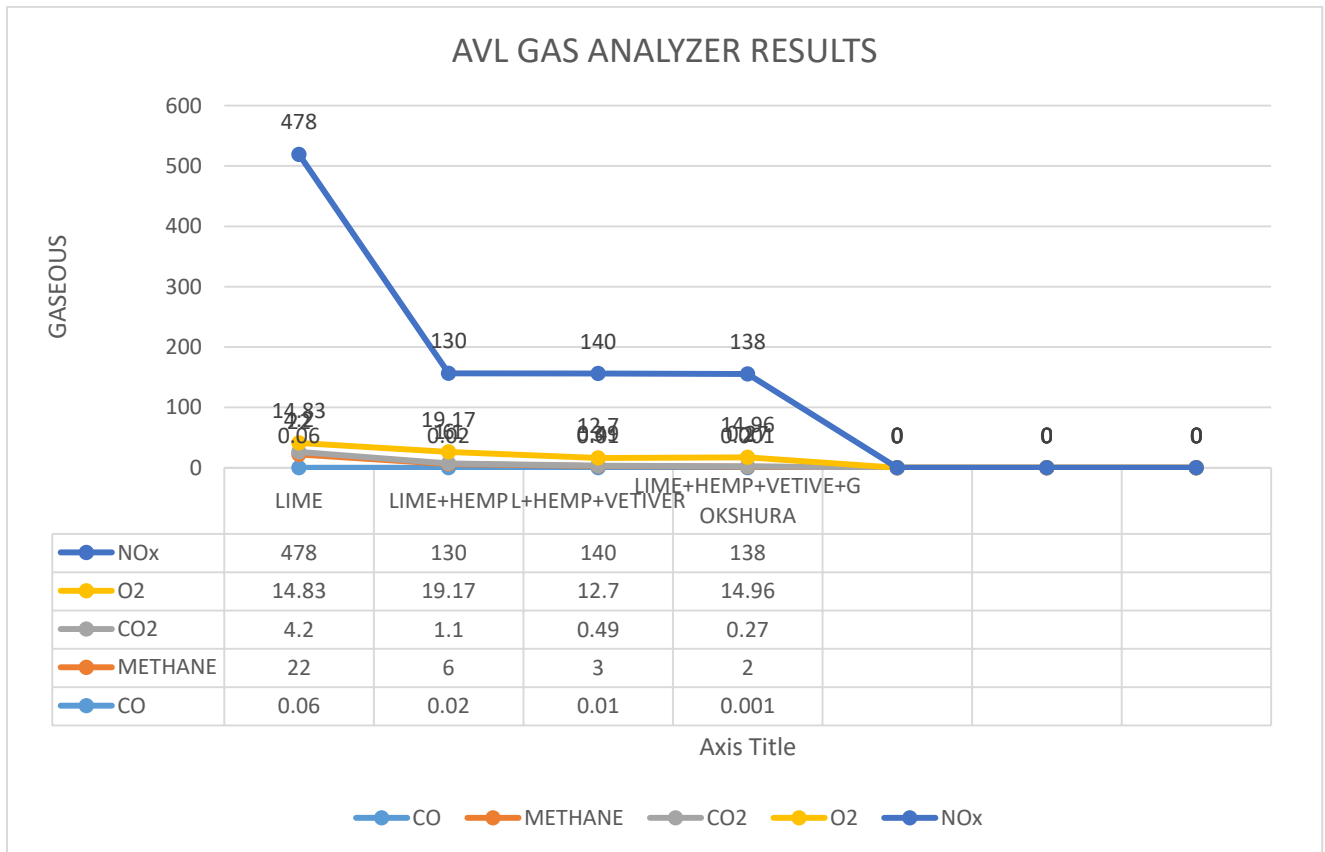
Certain glasshouse vaporous absorption held by AVL 5 propellant analyzer including a computer-aided single-cylinder four-stroke diesel motor their consumption ratio with a

- a)lime.
- b)lime+hemp.
- c)lime+hemp+vetiver.
- d)lime+hemp+vetiver+indian kudzu



(a)AVL gas analyzer,(b)srmist thermal lab,(c)gas exhaust,(d)lime panels

- a)lime particles co<sub>2</sub>absorption was 4.20%,
- b) caco<sub>3</sub>,cannabis sativa blended particlesco<sub>2</sub> emission was 1.10%,
- c) cannabis sativa,vetiver,caco<sub>3</sub> blended co<sub>2</sub> absorption was 0.49%,
- d)cannabis sativa,caco<sub>3</sub>,vetiver,gokshura co<sub>2</sub> absorption was 0.27% d<sup>th</sup> one was good .



(a) If we introduce LIME particles in gas outlet gas analyzer results

NO<sub>x</sub>,O<sub>2</sub>,CO<sub>2</sub>,METHANE,CO values are 478,14.83,4.2,22,0.06

(b)If we introduce LIME+HEMP particles in gas outlet gas analyzer results

NO<sub>x</sub>,O<sub>2</sub>,CO<sub>2</sub>,METHANE,CO values are 130,19.17,1.1,6,0.02

(c)If we introduce LIME+HEMP+VETIVER particles in gas outlet gas analyzer results

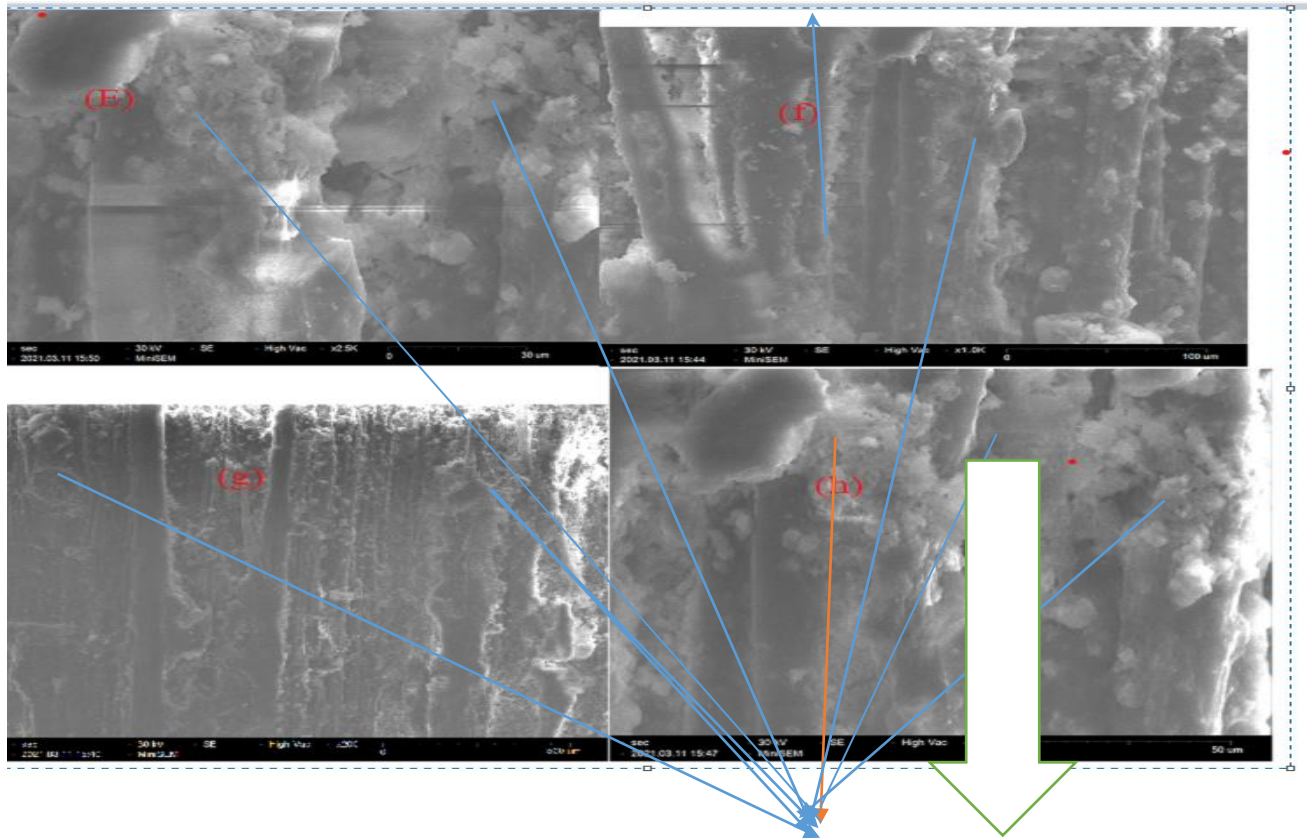
NO<sub>x</sub>,O<sub>2</sub>,CO<sub>2</sub>,METHANE,CO values are 140,12.7,0.49,3,0.01

(d)If we introduce LIME+HEMP+VETIVER+GOKSHURA particles in gas outlet gas analyzer results NO<sub>x</sub>,O<sub>2</sub>,CO<sub>2</sub>,METHANE,CO values are 138,14.96,0.27,2,0.001.

In these above particles when we introduced lime+hemp+vertiver+gokshura fragments in gas outlet the emissions are decreased quietly when compared to other (d) one shows very less emission

### SCANNING ELECTRON MICROSCOPE SHOWING CARBON PRESENT IN HEMP SHIVES

The elemental properties was studied using SEM analysis for co<sub>2</sub> sequestration ,analysis was to hemp,hemp+vetiver,hemp+vetiver+gokshura for 30 days as follows:



**Fig(h) shows more calcite and portlandite particles than other**

**figures**

Fig(e) lime particle was sent to SEM analysis which have less carbon,calcite,portlandite particles.

Fig(f) lime+hemp particle was sent to SEM analysis which have very few carbon,calcite,portlandite particles

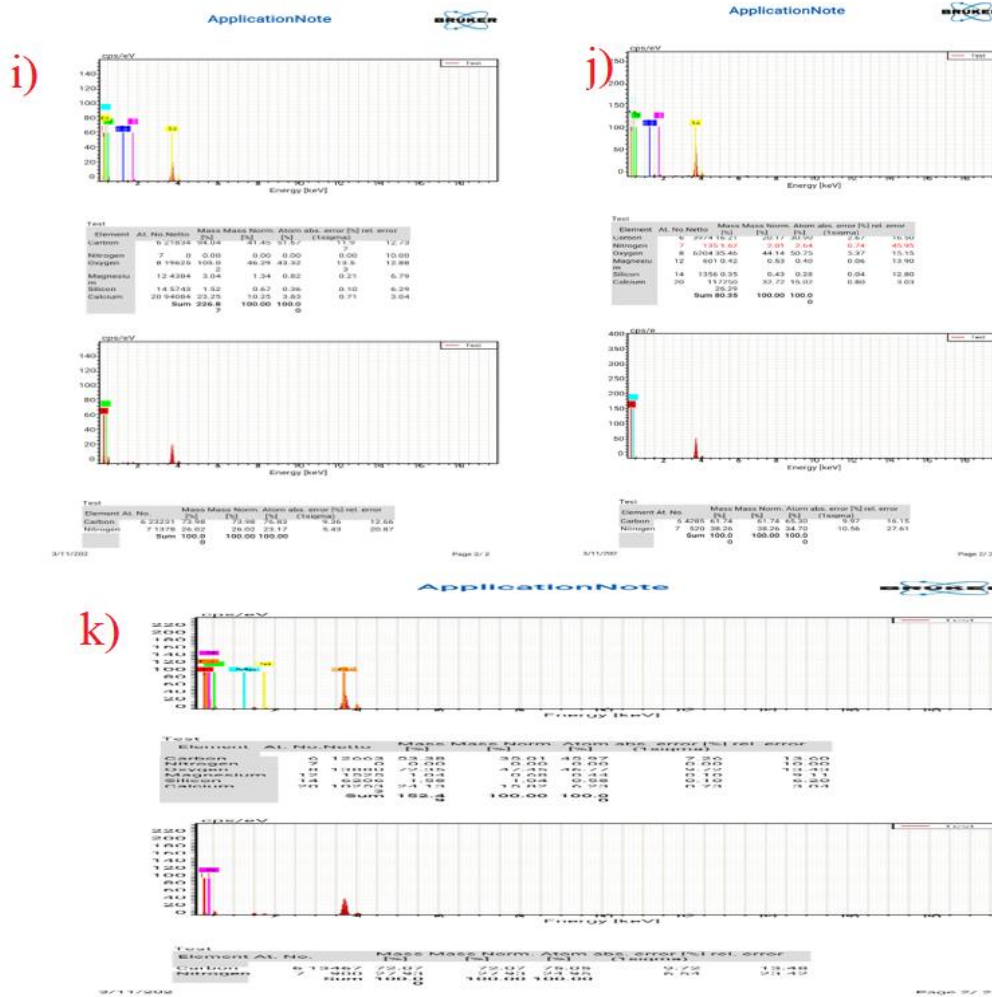
Fig(g) lime+hemp+vetiver particle was sent to SEM analysis which have few carbon,calcite,portlandite particles

Fig(h) lime+hemp+vetiver+gokshura particle was sent to SEM analysis which have more carbon,calcite,portlandite particles by above results we can conclude that SEM analysis of fig(h) lime+hemp+vetiver+gokshura have more carbon,calcite,portlandite particles than other 3. then we get the values of carbon ,hydrogen ,oxygen values from SEM analysis application we have to substitute in photosynthesis reaction to find how much co<sub>2</sub> it can absorb

Fig i)lime, fig j)hemp+lime ,fig k)hemp+lime+vetiver

now we will get carbon,hydrogen,oxygen values from SEM analysis from only k figure because hemp+lime+vetiver decreasing emissions of all gaseous on the basis of AVL GAS analyzer results By substituting SEM analysis values of carbon ,hydrogen,oxygen in photosynthesis reaction Theoretical assessment of carbon utilization through lime carbonation .





**Determination of level of carbon dioxide in natural additives :**

To identify the carbon , it is important to discover how much carbon was absorbed by hempcrete devoured by the hempcrete segment by photosynthesis,  $6CO_2 + 6H_2O \Rightarrow C_6H_{12}O_6 + 6O_2$  (1)

The test of the hempcrete particles held in hot air broiler for a time of 5 hours at 106degree celsius; and powdered for the SEM analysis to determine the carbon amount in lime hempcrete cube. The crushed powder gauged and exposed to SEM Essential investigations to decide how much percentage of carbon in them .Three examples were investigated and the outcomes per following:

Test 1: 45.25% Test 2: 59.8% Test 3: 59.97% Normal: 55.0066%

The mass of hemp shive 65.52g. From the SEM Basic results the carbon present in hemp shive is 31.56g. that Carbon dioxide responds with water to shape dextrose and that for each molecule of C in dextrose one mole of CO2 is devoured. From (2) it tends to be resolved that 261.692 of CO2 was captured by lime hempcrete cube.

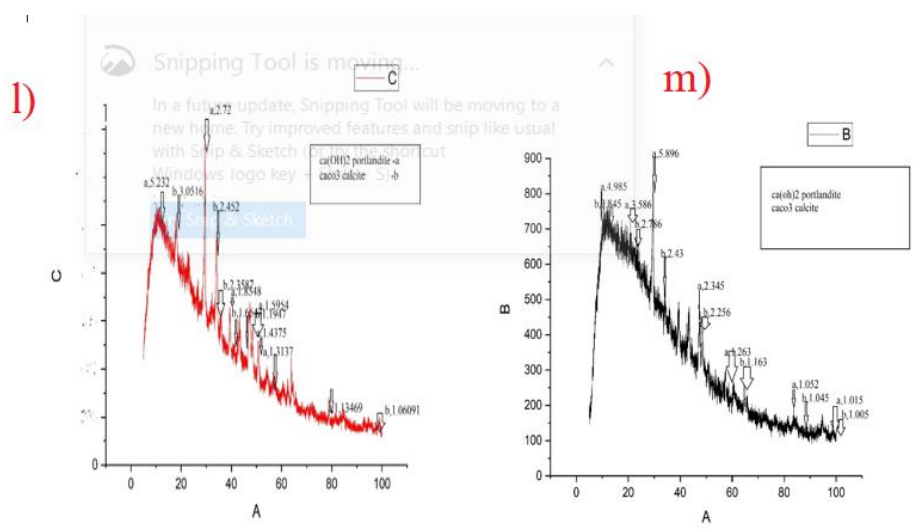
**Total carbon dioxide sequestration accomplished:**

absolute carbon capture accomplished by the lime hempcrete cube, which adds up to, 119.45 g of carbon dioxide. Nonetheless, the anticipated carbon capture capability of the testcube, determined by adding the consequences for hemp+vetiver+lime was 204.32g of CO2 for the test 3D square. The carbon capture results accomplished by the LHC blend planned for this exploration was more than the qualities (304.65 kg of carbon dioxide[4] and 305.96 kg of carbon dioxide distributed by different creators referenced[3] . The conceivable purpose behind this might be ascribed to the utilization of 90% Hydrated Lime as cover rather than monetarily

accessible fasteners like Tradical®, that join different materials (modernsquanders) like Fly Debris, Slag, and so forth, that don't attempt dynamic carbon sequestration. Be that as it may, the utilization of such mechanical squanders decreases co2 sequestration. consequently affecting net co2 sequestration byproducts of the item, and furthermore its effect on environmental change. The aforementioned effects in sections are summed to define the whole carbon capturing produced by the LHC test solid, which amounts to, 261.692 g of CO2 when convert to 1m3 of hemp panel the co2 sequestration potential was 523.384 kg of co2 sequestration at the age of 28 days ,better than 470.30 kg of co2 (11) by tarun jami and summit kumar .

**XRD test for finding calcite and portlandite:**

The chemical and mineral properties of .sample were found by XRD analysis it was found by using xray powder programme.



L chart showing hemp+lime,(calcite and portlandite) Mchart showing lime+hemp+vetiver(calcite and portlandite)

A qualitative stage investigation of the x ray diffraction information on Calcite and Portlandite uncovered that, at 28 years old days, hemp+lime,hemp+lime+vetiver,hemp+lime+vetiver+gokshura 43.44% regarding one fastener was Calcite and 79.18% was portlandite roughly. Though, HLV, HLVGcontained extremely modest quantities of calcite5.1345% and 5.1356% separately. X-ray diffractograms of Tests 1, 2, and 3 have appeared in Figures 3, 4, and 5 separately. It tends to be seen thatcaco3 tops just as ca(oh)2 tops were reliable on the whole the three diffractograms at d-estimations of 4.985 – 3.845 for calcite; and 1.015-1.005alongside other small tops for portlandite. shows the statement of caco3 on the hemp shiv/molecule that was separated from cube for SEM examination.

**By substituting XRD analysis values of calcite,portlandite values in reactionTheoretical assessment of carbon utilization through lime carbonation**

The lime carbonation is represented accompanying twofold substitution response:  
 $CaCO3 + H2O \Rightarrow Ca(OH)2 + CO2(2)$   
 Lime in the cube was 117.9g. Subsequently, 91% Hydrated lime and lime undergo carbonation during this blend, the hydrated lime is 106.11g. primeval Molar volumes of ca(oh)2 were 75g/mol and co2 45g/mol, By ascertaining the amount of Ca(OH)2 present in the square by

utilizing its molar mass worth, the number of moles of CO<sub>2</sub> necessitated to carbonate the convenient Ca(OH)<sub>2</sub> (Portlandite) can be assessed from condition (1). it furnishes assessed carbon utilization throughout the carbonation of the binder in the cube. The assessed most extreme carbon absorbing can accomplish through lime carbonation cover is determined at 79.03g.

**Heat insulation measuring from panels mextech DT 8811 thermometer**

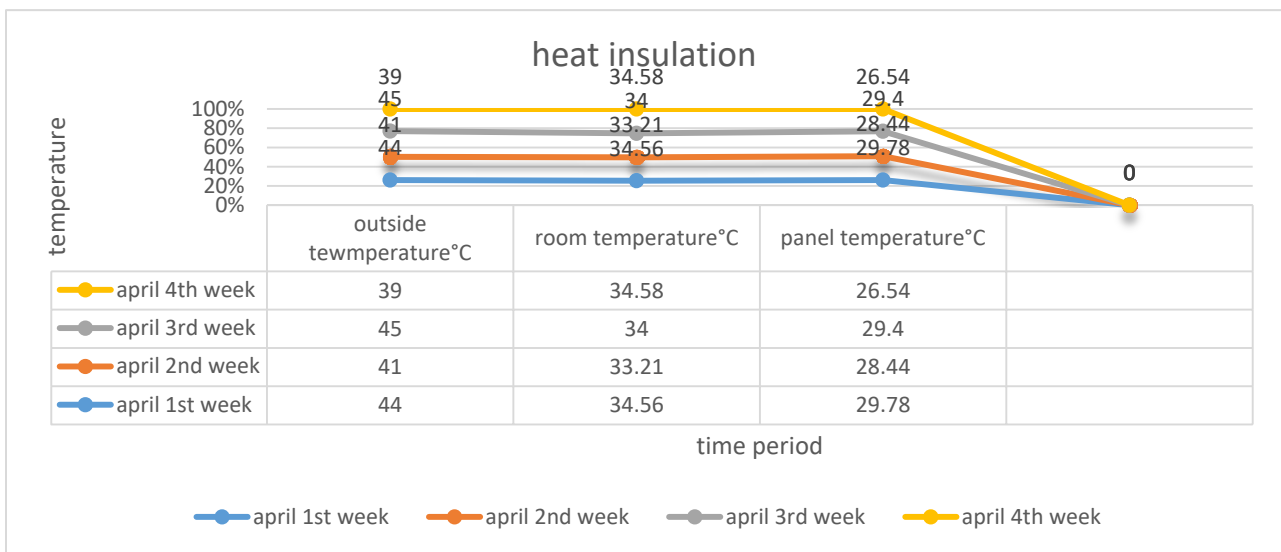


fig n,o,p showing measuring heat insulation by MEXTECH DT 8811 thermometer

We made lime panel blending with hemp+vetiver+gokshura which shows good results for increasing heat insulation.

**RESULTS AND DISCUSSIONS**

**AVL 5 gas analyzer with computerized single cylinder four stroke diesel engine their absorption percentage with lime,lime+hemp,lime+hemp+vetiver.**

1)When lime fragments were placed in outlet chamber at 16kN load the co absorption was 0.06%(vol),

Hydrocarbons 22ppm,co<sub>2</sub> 4.20% vol,Nox=478ppm,smoke 83.2 opacity.

2)When lime fragments with hemp were placed in outlet chamber at 16kN load the co absorption was0.02%(vol),Hydrocarbons 6ppm,co<sub>2</sub> 1.10% vol,Nox=130ppm,smoke 40.80 opacity.

3)When lime fragments with hemp &vetiver were placed in outlet chamber at 16kN load the co absorption was 0.09%(vol),Hydrocarbons 3ppm,co<sub>2</sub> 0.49% vol,Nox=140ppm,smoke 24.43opacity.

4)When lime fragments with hemp,vetiver&gokshura were placed in outlet chamber at 16kN load the co absorption was 0.09%(vol),Hydrocarbons 18ppm,co2 = 0.27%vol,NOx=138ppm,smoke 34.56opacity.

**Xray diffraction results**

This values were to measure the amount of the caco3 present in the binder and the results:

Lime+hemp :40.65 g

Lime+hemp+vetiver: 79.86 g

From the above-results, the no of moles of caco3 was evaluated and introduced in equation (1)  $CaCO_3 + H_2O \Rightarrow Ca(OH)_2 + CO_2$  to find the amount of carbon dioxide consumed

Lime+hemp : 19.26g of CO<sub>2</sub>

Lime+hemp+vetiver: 39.36 g of CO<sub>2</sub>

The summation of the amount of carbon dioxide by the binder gives the total carbon dioxide consumed through carbonation of hydrated lime in LHC.

Therefore, the average CO<sub>2</sub> absorbed by the binder at the age of 28 days is lime+hemp=19.26gm

Therefore, the average CO<sub>2</sub> absorbed by the binder at the age of 28 days is lime+hemp+vetiver=39.36gm.

**SEM Elemental Analysis Results**

The desiccated, crushedhemp shives held precisely balanced and subdued to SEM analyses to ascertain the how much ratio synthesis of carbon in them. Three specimens were examined and the consequences are as complies:

Sample 1	Sample 2	Sample 3	AVERAGE
65.25%	65.78%	65.24%	65.423%

The bulk of shives within the solid determined utilizing the quantity ratios and green weight is 65.423g.Of the normal SEM analysis results, it is confirmed that the core of carbon instant in the form of hemp shives in the test solid is 32.7115g.Equation (2)  $C_6H_{12}O_6 + 6O_2 \Rightarrow 6CO_2 + 6H_2O$  shows that carbon dioxide reacted with water to form C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> and each atom of C in C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> one mole of CO<sub>2</sub> is exhausted. From (2) it can be concluded that 261.692 grams of CO<sub>2</sub> was utilized by the hemp portion of the Lime hemp concrete cube.

**Whole carbon-capturing**

The aforementioned effects in sections are summed to define the whole carbon capturing produced by the LHC test solid, which amounts to, 261.692 g of CO<sub>2</sub> when convert to 1m<sup>3</sup> of hemp panel the co<sub>2</sub> sequestration potential was 523.384 kg of co<sub>2</sub> sequestration at the age of 28 days ,better than 470.30 kg of co<sub>2</sub> by [tarun jamiet al].

**Heat insulation results by DT8811 thermometer**

We got good results for heat insulation outside temperature was 39 °C,room temperature was 34.58 °C but our heat insulation panel temperature was 26.54 °C

## CONCLUSION

By AVL DIGAS 444N Gas analyser their absorption percentage ,lime+hemp+vetiver. Shows good absorption of green house gaseous When lime fragments with hemp &vetiver were placed in outlet chamber at 16kN load the co absorption ,**Hydrocarbons ,co2 ,NOx ,smoke declined periodically**. By XRD analysis calcite and portlandite co2 consumed by lime+hemp+vetiver cube was 39.36gm,whole carbon capturing by SEM analysis was 130.844 gm of co2.by these results we can conclude that more natural additives(spices)which are grown in abundant can absorb more co2 and also can increase compressive strength of lime. It was found in this research that, 1 m<sup>3</sup> pannel of lime hempveticrete has a carbon sequestration potential of up to **523.384 kg of CO<sub>2</sub>**, while, at the age of 28 days.By SEM analysis The test of the hempcrete particles held in hot air broiler for a time of 5 hours at 106degree celsius; and powdered for the SEM analysis to determine the carbon amount in lime hempcrete cube.The crushed powder gauged and exposed to SEM Essential investigations to decide how much percentage of carbon in them .Three examples were investigated and the outcomes per following: Test 1: 45.25% Test 2: 59.8% Test 3: 59.97% Normal: 55.0066% third sample lime+hemp+vetiver+gokshura have more carbon particles.Heat insulation results by DT8811 thermometer We got good results for heat insulation outside temperature was 39 °C,room temperature was 34.58 °C but our heat insulation panel temperature was 26.54 °CThe aforementioned effects in sections are summed to define the whole carbon capturing produced by the LHC test solid, which amounts to, 261.692 g of CO<sub>2</sub> when convert to 1m<sup>3</sup> of hemp panel the co2 sequestration potential was 523.384 kg of co2 sequestration at the age of 28 days ,better than 470.30 kg of co2 (11) by tarun jami and summit kumar .

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