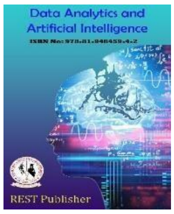
DOI: https://doi.org/10.46632/daai/2/6/13

Data Analytics and Artificial Intelligence
Vol: 2(6), 2022
REST Publisher; ISBN: 978-81-948459-4-2

Website: http://restpublisher.com/book-series/daai/



Effects of Characteristics of Sisal Fiber Using the SPSS Method

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Abstract. *The distinguishing qualities or traits of anything are its characteristics. They can be viewed as traits that set one person or thing apart from another. For instance, the chameleon's ability to blend in is one of its traits. Soft, straight, and golden in color, sisal fibers are. Sisal can have long or short fibers because it is extremely coarse and rigid. Because of its strength, toughness, stretch ability, compatibility with some colors, and resilience to degradation in saline water, sisal is prized for use as cordage. Sisal can be fashioned into carpets, mats, and a variety of handicrafts in addition to its traditional applications as rope, ropes, string, and yarn. Sisal fiber is a tough, robust material with low flexibility that is obtained from freshly cut leaves of the plant. It is crucial in the production of materials like carpeting, coarse purses, maritime rope (where strong resistance to saltwater is required), and cordage. Research significance: In recent years, materials engineers and material scientists have paid close attention to sisal-fiber reinforced composites as a type of environmental composites. Effects of fiber surface treatment on fiber compressive properties and fiber-matrix are discussed in this article. Tensile as well as single-strand strand pull tests were used, respectively, to assess the interfacial characteristics. For assessing the implies that the average shear resistance of composite laminates, a short beam shearing test was also carried out. High density polyethylene (HDPE), vinyl ester, and epoxy were selected as the matrix materials. Two different fiber surface treatment techniques, chemical bonding and oxidation, were used to boost interfacial strength. According to the results, different fiber surface-treatment techniques had varying effects on the tensile strength of sisal fiber, as well as the strength and bonding characteristics of the fiber-matrix interface. As a result, this work can provide important knowledge on jute fiber-polymer matrix compound interface design. Method: Ratio studies are statistical analyses of data from appraisals and property valuations. Nearly all states utilize them to produce quantitative measure of the proportion of current market price about which individually estimated taxable property is appraised as well as to offer assessment performance indicators. Evaluation parameters: Fiber diameter (mm), Water content (%), Tensile strength(MPa), Tensile modulus(GPa) and Elongation at break (%) Result: The Cronbach's Alpha Reliability result. The overall Cronbach's Alpha value for the model is .658 which indicates 66% reliability. From the literature review, the above 50% Cronbach's Alpha value model can be considered for analysis. Conclusion: Characteristics of sisal fiber the Cronbach's Alpha Reliability result. The overall Cronbach's Alpha value for the model is .658 which indicates 66% reliability. From the literature review, the above 50% Cronbach's Alpha value model can be considered for analysis.*

Keywords: *Fiber diameter (mm), Water content (%), Tensile strength(MPa), Tensile modulus(GPa) and Elongation at break (%).*

1. INTRODUCTION

sisal fiber in composites has gradually moved from semi to engineering applications as a result of this characterization. The majority of components made of natural fiber composites are created during primary manufacturing, however due to the complexity of the manufacturing process, several simple shaped components must be interlocked to create an entire assembly. Characteristics The feed can be adjusted to modify the chip's thickness. Because tungsten carbide drills have excellent anti-wear properties, they were chosen in the current experimental study to prevent the impact of tool wear mostly on chip production characteristics [1]. Sisal fibers are subjected to a variety of conditioning pre-treatments, such as mechanical alloying, cryogenic grooving, and hot water washing. The project's objective was to explain how pretreatment altered the infrared spectra and crystallinity of sisal. The outcomes of electron scanning microscopy allowed for recognize pathological alterations on the fibre surface. Absorption spectroscopy reflectance/Fourier transform spectrometer (FTIR) has been used to study significant changes in chemical appearance, and cellulose, lignin, and xylan make up the majority of cellular walls [2]. Due of its low density and good specific characteristics, sisal fibre (SF) was among the most intriguing possibilities for reinforcing NR. Furthermore, SF is indeed a tropical flower that may be grown throughout Thailand. In addition to giving the fibre more value, the utilization of SF as reinforcement material for NR polymers is advantageous for the environment. Various loadings of sisal fibre in natural rubber. To increase the compatibility amongst sisal fibre and natural rubber, homemade inorganic compound with the formula (NR-g-MA) grafted synthetic rubber and anhydride neoprene (ENR50) were employed burning time, and curing time all reduced with increasing fibre loading, while their rip strength and toughness rose [3]. From Sheba Fiber reinforced composites and Handicrafts in Bhuvankodu, Tamil Nadu, India, sisal fibers were purchased. Macon in Kottayam, Kerala, India supplied the is phthalic composite materials, cobalt naphthenate together with methyl isobutyl acetone peroxide and (accelerator) (curing agent). For the purpose of modifying the surface of the fiber, commercial-grade chemicals such as potassium permanganate, benzyl chloride, and sodium hydroxide were used. The vinyl tris (2-ethoxy ethoxy) silicone coupling agent was made available by Lab Agencies in Bangalore, India. employed [4]. Plants are used to generate sisal fibre. Their size and shape were asymmetrical. The minimum size is reduced to 25 x 20 x 4 cm. Even then, their surface had some crusts as well as dips, making them anything but flat. It was put in a mould and squeezed sisal fibers between stainless steel plates. have been added to an alkaline solution with constant stirring for room temperature for 24 hours to make it flat. To remove any leftover NaOH from the fibres, they were washed numerous times in distilled water comprising 1% acidic acid. The fibers were then dried in a hot air oven at 1000 C for 24 hours. Raw ingredients for ZrO2 NPs were created using the sol-gel technique. Zirconium oxychloride (ZrOCl28H2O) solution was gradually mixed with diluted nitric acid solution until the combination became transparent. The workable solution was made from deionized and twice-distilled water [5]. Due to its high natural rubber specific strength and modulus, low density, and lack of health risks, sisal fibre is one of the more intriguing choices for reinforcing. In addition, Thailand is a major producer of sisal fibre from tropical plants. The incompatibility between hydrophilic natural fibre and hydrophilic NR matrix, which results in subpar mechanical characteristics of the composites, is the fundamental issue with employing natural fibre to reinforce NR. By treating the fibre, altering the matrix, and adding compatibilizers, the interaction between natural fibre and NR reinforcement material can be increased [6]. Study participants looked at how adding sisal fibre content (SF) fillers affected the friction and wear properties of composites composed of UHMWPE. The aggregates were evaluated in water-lubricated test conditions against such a QSn7-0.2 bronze discs using a specially designed test instrument circumstances. Finding an advanced material that can be utilised in waterlubricated bearings is the goal. Four distinct composite materials, including pure Modified bitumen and UHMWPE with 10, 20, and 30 weight percent SF reinforcement, were tested at various sliding directions and application stresses. The tribological characteristics of these lightweight materials were evaluated using measurements of the drag coefficient and wear rate. Additionally, numerous surface characterization techniques were applied to the surface of lightweight materials in order to elucidate the fundamental process underlying friction and wear [7]. LDPE composites reinforced with sisal fibre. They discovered that as the fibres' hydrophilicity reduced with the modification in chemistry, the dielectric values also decreased. It was discovered that chemically treated fibre composites had better bulk resistance values than untreated ones. According to research on how sisal fibre orientation affects the electrical characteristics of sisal fibre reinforced epoxy composites, the dielectric strength and tan of epoxy reduced in sisal fibre epoxy composites that were orientated 0 and 90 degrees [8]. Since sisal fibres have a high tensile strength, they are frequently employed in the creation of cementbased composites. However, it is important to employ fibre lengths higher than 40 mm because then stresses may be transmitted from the fibre matrix because of its low adhesion to Willamette cement-based matrices, which, according to the research, ranges somewhere around 0.32 and 0.72 MPa. Multiple cracks can develop in the bridging zone Sisal fibres have a high water absorption capacity, which contributes to low chemical adhesion as well as size fluctuations that lead to loss of physical interaction with both the matrix as a result of alterations in the composite's moisture content [9]. Sisal fibre is utilised in a variety of products, including ropes, carpets, mats, and handicrafts. It is used to create composites with other polymers that boost the strength of something like the monomers due to its high tensile strength. Today, sisal fibre is employed in many different fields because it is affordable, biodegradable, and environmentally beneficial. At the moment, a lot of research is being done on sisal fibre reinforced composites and their effectiveness. Fiber composites must possess specific mechanical qualities, such as flexibility, strong tensile strength, and low wear characteristics, in order to be used in a variety of applications [10]. This study's initial goal was to look into the chemical procedure used to make AC from waste industrial sisal fibre. One step is required to finish chemical processing. This method combines the carbonization and activation processes for improved microstructure development. (2013) Tiwari et al. The second goal was to characterize the surface area, x - ray diffraction analysis, pore properties, and morphological characteristics in order to explore the impacts of carbonization factors [11]. Extrusion-injection molding is used to create polypropylene composites reinforced with sisal fibre. This study's goal was to conduct an experimental investigation into the impact natural frequency and damping of free vibrations are assessed using the impulse hammer excitation technique. Acoustic characteristics like transmission loss and sound absorption coefficient are assessed using impedance tubes. The vibration but instead acoustic responsiveness of polypropylene composites is considerably altered by an increase in fibre loading, according to experimental results. When comparing to other composites, model research revealed that sisal fibres at a 30 weight percent concentration in polypropylene improved the natural frequency. High fibre, however, makes attenuation worse [12]. To boost adhesion in informed decisions regarding phenolic thermoset matrices, sisal fibres are chemically changed by interaction with lignocellulose, which are derived from sorghum Bacchus as well as Pinus species of wood. According to inverse gel electrophoresis (IGC) data, phenolic thermoset and unmodified/modified sisal fibres exhibited a predominance of acid bases. phenolic thermoset has tightly diffusible components with changed fibres, according to the IGC data. indicating good thermoset relationships with less polarised fibres. Surface SEM pictures of changed fibres demonstrated accelerated disintegration of fibre bundles following treatment, less compacted interfibrillar structure in comparison to unmodified fibres, greater contact area, and facilitated microorganism biodegradation in simulating soil [13]. The sisal fibre we chose is indigenous to northern Morocco 25 and is primarily utilised in traditional medicine at the moment. 26 Another of the most popular natural fibre sources is the sisal plant, which is also simple to grow. It is made from the sugarcane (Agave sisalana) plant's leaves. In our investigation, we looked into how Moroccan sisal fibre affected the properties of PLA matrix nanocomposites. This project's goal was to ascertain how the sisal fibre content affected the mechanical properties mechanical characteristics of Poly (ethylene biocomposites [14]. These curves depict the steadystate debonding characteristics of the untreated, DCP- and KMnO4-treated, and transient debonding characteristics of the silane-treated fibres. There is a mechanical link between the fibre and the matrix, as evidenced by the similarity between the capacity curves of sisal fibres treated with permanganate and DCP and those treated with cementitious composites and epoxy resins' permanganate and DCP [15]. One of the stronger fibres is sisal, which has a wide range of uses. 13 The two significant fibre products still present in the palm oil mill are oil palm mesocarp fibres and oil palm hollowed fruit bunch fibres. It is advantageous to employ these fibres cheaply as reinforcements because these waste products lead to significant environmental issues. Because of their extreme toughness, oil palm fibres have been identified as some potential reinforcements in hydrocarbon resins [16]. laminates made of banana/epoxy, coir/epoxy, and sisal/epoxy. At 77 K, they attach more strongly than they do at room temperature. The physical properties of these natural fibers could possibly be to blame for these alterations. Laceration holes were also seen in the laminates after they had fractured, showing that the composite laminate had weak areas both at normal temperature and at cryogenic temperatures [17]. Investigations were done on sisal fibre composites. IGC was utilised to assess the surface alterations of sisal fibres following chemical modifications for a more thorough characterisation of the fibres. The surfaces of sisal fibres that had been treated and left untreated were examined for dispersion and acid-base characteristics. Experiments on biodegradation were also conducted. In a related work, sisal fibres underwent additional PFA alteration employing K2Cr2O7 as an oxidising agent. In this instance, cellulose polymer was mostly affected by the oxidation effects rather than lignin, which were seen when the material was exposed to ClO2. According to SEM pictures, sisal fibre oxidation and reactivity with FA or PFA promote fiber/phenolic substrate interaction [18]. Sisal fibres with a 20° twist angle have good impact characteristics. 28 Banana fibre has a lower fracture toughness than sisal fibre, with a microfibrillar angle of 11°. Sisal fibre has a greater lumen volume than banana fibre (Table II), increasing the fiber's breathability and impact strength. The fracture toughness of banana/sisal hybrid fibre reinforced epoxy composite is enhanced by boosting the relative moisture content of sisal [19]. This experimental investigation had as its goal the preparation and testing of a sisal fibre composite material with various fibre orientations. Rubber is inserted in an isolated system matrix called concrete in reinforced concrete, which is comparable to composites. Their low density values make it possible to create composites with the matrix using selfconsolidating epoxy resins. The placement of the fibres is arbitrary. used to prepare the compounds for compression moulding. Through the use of the life cycle assessments (LCA) method and a cradle-to-gate approach, three cement mixtures containing various natural fibres (flax, jute, and seagrass) were assessed from an environmental standpoint [20].

2. MATERIAL AND METHOD

Fiber diameter (mm): Natural and synthetic fibres typically have a diameter between 7 and 20 m. A finer range of 3–7 microns is possible with the use of microfiber towels and bicomponent split fibres. There are four different types of multimode fibre: OM1 (62.5/125 m), OM2, OM3, and OM4 (50/125 m). Multimode fibre is available in either diameters, 62.5 or 50 mm. The single mode core has a 9 m diameter. Sheath diameter for both fibre kinds is 125 m, or microns. **Water content (%):** The weight of measured quantity of solids in a specific soil is expressed as the water content (w), sometimes referred to as optimum moisture content meaning natural moisture content. Typically, a percentage is used to indicate this ratio. The water content is equivalent to zero if the spaces are all filled with air (dry soil). The expression 0.1566 x w/v, where W is the quantity in mg of disodium tartrate and V is the percentage in ml of reagent, is used to compute the water equilibria factor F in mgs of H2O per millilitre of reagent.

Tensile strength (MPa): The force measured in square inch pounds (psi) or yoh (MPa) needed to pull a specimen until the material fails is known as tensile strength. A specimen in the shape of a dumbbell is placed in the clutches or jaws of a force sensor to conduct this test. In the English metric measurements, tensile strengths are typically given in units of lbs per square inch, which are sometimes abbreviated as psi. For structural steel, the structural rigidity is (400 megapascals (MPa), while for carbon steel, it is 841 MPa. For various steel densities, different tensile strength values apply. Tensile strength comes in three varieties: A material's yield strength is its capacity to withstand stress without permanently deforming it.

Tensile modulus (GPa): A solid's tensile modulus is a mechanical characteristic that gauges how stiff it is. Its ratio to its strain (relative compression) when undergoing elastic modulus is known as its applied load (force per unit area). Using the stress formula, determine the tensile force you applied: $\sigma = F/A$ To obtain Young's ratio, divide the longitudinal strain by the tensile stress. modulus is E = /. Young's modulus, which has pascal as its SI unit, is of elasticity (Pa). The behaviour of a material in the elastic deformation zone (also known as Hooke's law) can be determined using the plastic strain curve when a stretching force (also known as a tensile force) is applied. The ratio of stress to strain, elasticity in tension is equal to the slope of the material's stress-strain curve.

Elongation at break (%): 2 Break elongation (%) The ratio of the length altered after that the experiment specimen breaks to the initial length is known as elongation at break, often referred to as strain at break. It illustrates how naturally occurring plant fibre can withstand form changes without cracking. The term "elongation at break" describes how much Before breaking, a material can lengthen by a certain percentage of its initial dimensions. It quantifies the extent to which a component deforms plastically and being the up to fractures and is also known as percentage elongation. The amount of elongation a capable of resisting before breaking is known as elongation at break. It is not a unit. At rest, a rod that is 15 cm long is 0.5 cm long.

Method: SPSS Statistics is a statistical control Advanced Analytics, Multivariate Analytics, Business enterprise Intelligence and IBM a statistic created by a software program is a package crook research. A set of generated statistics is Crook Research is for a long time SPSS Inc. Produced by, it was acquired by IBM in 2009. Current versions (after 2015) icon Named: IBM SPSS Statistics. The name of the software program is to start with social Became the Statistical Package for Science (SPSS) [3] Reflects the real marketplace, then information SPSS is converted into product and service solutions Widely used for statistical evaluation within the social sciences is an application used. pasted into a syntax statement. Programs are interactive Directed or unsupervised production Through the workflow facility. SPSS Statistics is an internal log Organization, types of information, information processing and on applicable documents imposes regulations, these jointly programming make it easier. SPSS datasets are two-dimensional Have a tabular structure, in which Queues usually form Events (with individuals or families) and Columns (age, gender or family income with) to form measurements. of records Only categories are described: Miscellaneous and Text content (or "string"). All statistics Processing is also sequential through the statement (dataset) going on Files are one-to-one and one-to-one Many can be matched, although many are not In addition to those case-variables form and By processing, there may be a separate matrix session, There you have matrix and linear algebra on matrices using functions Information may be processed.

3. RESULT AND DISCUSSION

TABLE 1. Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
Fiber diameter (mm)	90	4	1	5	282	3.13	.115	1.093	1.196
Water content (%)	90	4	1	5	270	3.00	.131	1.245	1.551
Tensile strength(MPa)	90	4	1	5	291	3.23	.133	1.264	1.597
Tensile modulus(GPa)	90	4	1	5	294	3.27	.119	1.130	1.276
Elongation at break (%)	90	4	1	5	297	3.30	.158	1.495	2.235
Valid N (listwise)	90								

Table 1 shows the descriptive statistics values for analysis N, range, minimum, maximum, mean, standard deviation Fiber diameter (mm), Water content (%), Tensile strength(MPa), Tensile modulus(GPa) and Elongation at break (%) this also using.

TABLE 2. Frequencies Statistics

		Fiber diameter (mm)	Water content (%)	Tensile strength(MPa)	Tensile modulus(GPa)	Elongation at break (%)
N	Valid	90	90	90	90	90
	Missing	0	0	0	0	0
Mean		3.13	3.00	3.23	3.27	3.30
Std. Error of Mean		.115	.131	.133	.119	.158
Median		3.00	3.00	3.00	3.00	3.00
Mode		3	3	3	3	5
Std. Deviation		1.093	1.245	1.264	1.130	1.495
Variance		1.196	1.551	1.597	1.276	2.235
Skewness		-.429	.321	-.043	-.260	-.098
Std. Error of Skewness		.254	.254	.254	.254	.254

Kurtosis		.047	-.794	-.900	-.198	-1.484
Std. Error of Kurtosis		.503	.503	.503	.503	.503
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5
Sum		282	270	291	294	297
Percentiles	25	3.00	2.00	2.00	3.00	2.00
	50	3.00	3.00	3.00	3.00	3.00
	75	4.00	4.00	4.00	4.00	5.00

Table 2 Show the Frequency Statistics in characteristics of sisal fiber. Fiber diameter (mm), Water content (%), Tensile strength(MPa), Tensile modulus(GPa) and Elongation at break (%) curve values are given.

TABLE 3. Reliability Statistics

Cronbach's Alpha Based on Standardized Items	N of Items
.658	5

Table 3 shows the Cronbach's Alpha Reliability result. The overall Cronbach's Alpha value for the model is .658 which indicates 66% reliability. From the literature review, the above 50% Cronbach's Alpha value model can be considered for analysis.

TABLE 4. Reliability Statistic individual

	Cronbach's Alpha if Item Deleted
Fiber diameter (mm)	.587
Water content (%)	.656
Tensile strength(MPa)	.536
Tensile modulus(GPa)	.591
Elongation at break (%)	.614

Table 4 Shows the Reliability Statistic individual parameter Cronbach's Alpha Reliability results. The Cronbach's Alpha value for Fiber diameter (mm) .587, Water content (%) .656, Tensile strength(MPa) .536, Tensile modulus(GPa) .591 and Elongation at break (%) .614this indicates all the parameter can be considered for analysis.

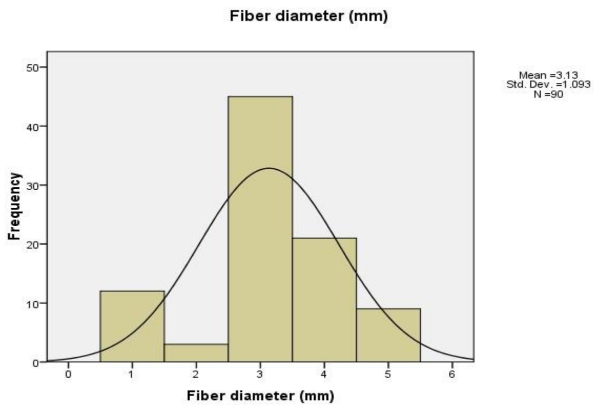

FIGURE 1. Fiber diameter (mm)

Figure 1 shows the histogram plot for Fiber diameter (mm) from the figure it is clearly seen that the data are slightly Left skewed due to more respondent chosen 3 for Fiber diameter (mm) except the 2 value all other values are under the normal curve shows model is significantly following normal distribution.

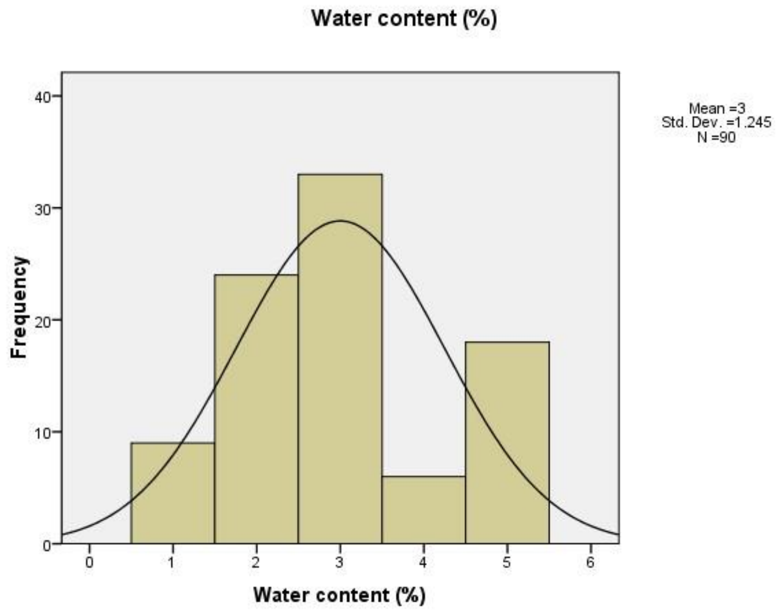

FIGURE 2. Water content (%)

Figure 2 shows the histogram plot for Water content (%) from the figure it is clearly seen that the data are slightly Left skewed due to more respondent chosen 3 for Water content (%) except the 2 value all other values are under the normal curve shows model is significantly following normal distribution.

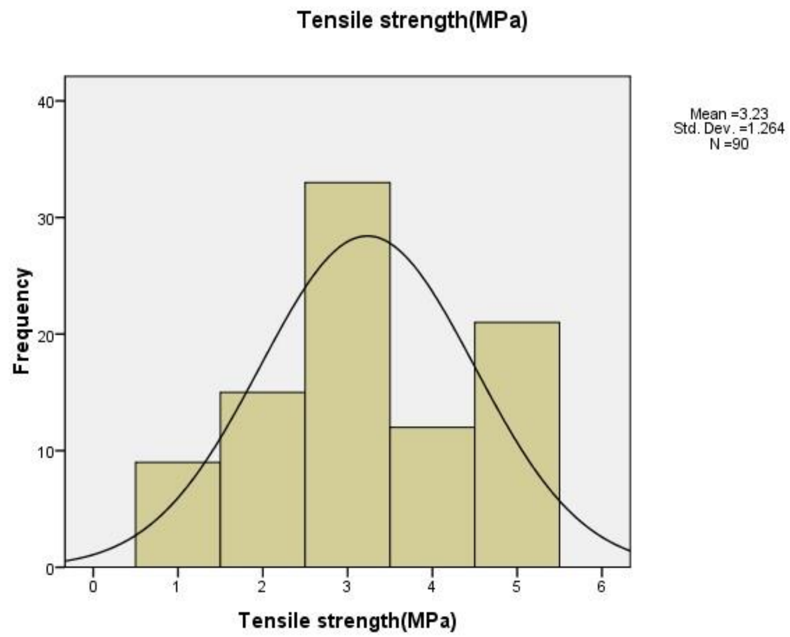

FIGURE 3. Tensile strength(MPa)

Figure 3 shows the histogram plot for Tensile strength(MPa) from the figure it is clearly seen that the data are slightly Left skewed due to more respondent chosen 3 for Tensile strength(MPa) except the 3 value all other values are under the normal curve shows model is significantly following normal distribution.

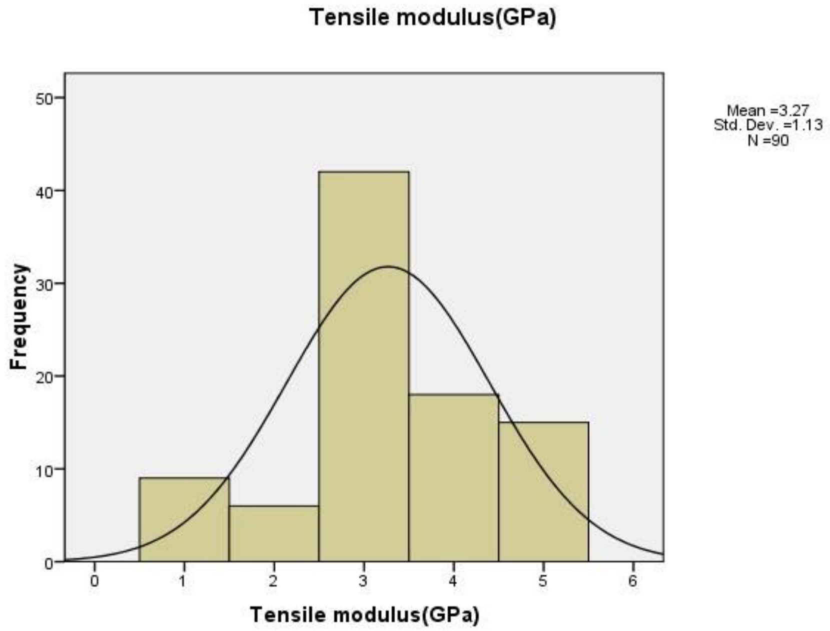

FIGURE 4. Tensile modulus(GPa)

Figure 4 shows the histogram plot for Tensile modulus(GPa) from the figure it is clearly seen that the data are slightly Left skewed due to more respondent chosen 3 for Tensile modulus(GPa) except the 2 value all other values are under the normal curve shows model is significantly following normal distribution.

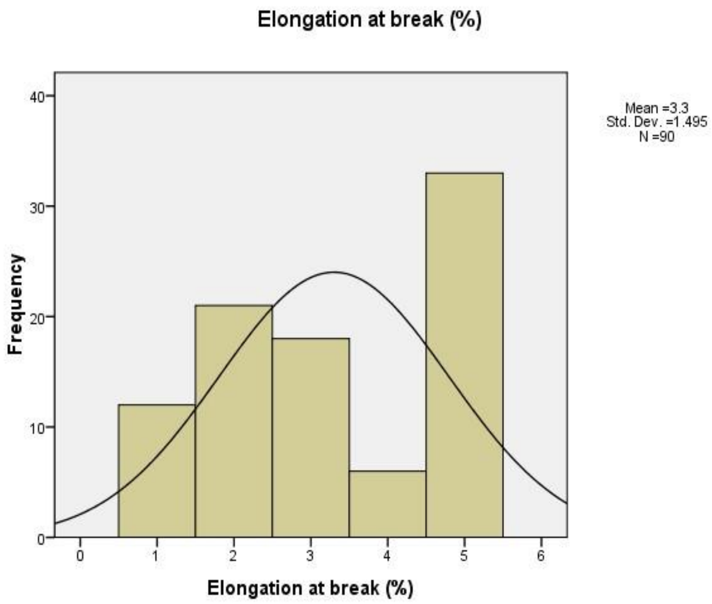

FIGURE 5. Elongation at break (%)

Figure 5 shows the histogram plot for Elongation at break (%) from the figure it is clearly seen that the data are slightly Right skewed due to more respondent chosen 5 for Elongation at break (%) except the 2 value all other values are under the normal curve shows model is significantly following normal distribution.

TABLE 5. Correlations

	Fiber diameter (mm)	**Water content (%)**	**Tensile strength(MPa)**	**Tensile modulus(GPa)**	**Elongation at break (%)**
Fiber diameter (mm)	1	.149	.368**	.407**	.264*
Water content (%)	.149	1	.214*	.096	.290**
Tensile strength(MPa)	.368**	.214*	1	.499**	.319**
Tensile modulus(GPa)	.407**	.096	.499**	1	.172
Elongation at break (%)	.264*	.290**	.319**	.172	1
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Table 5 shows the correlation between motivation parameters for Fiber diameter (mm). For Tensile modulus(GPa) is having highest correlation with Water content (%) and having lowest correlation. Next the correlation between motivation parameters for Water content (%). For Elongation at break (%) is having highest correlation with Tensile modulus(GPa) and having lowest correlation**.** Next the correlation between motivation parameters for Tensile strength(MPa). For Tensile modulus(GPa) is having highest correlation with Water content (%) and having lowest correlation**.** Next the correlation between motivation parameters for Tensile modulus(GPa). For Tensile strength(MPa). For Tensile modulus(GPa) is having highest correlation with Water content (%) and having lowest correlation**.** Next the correlation between motivation parameters for Elongation at break (%). For Tensile strength(MPa) is having highest correlation with Tensile modulus(GPa) and having lowest correlation**.**

4. CONCLUSION

The distinguishing qualities or traits of anything are its characteristics. They can be viewed as traits that set one person or thing apart from another. For instance, the chameleon's ability to blend in is one of its traits. Soft, straight, and golden in colour, sisal fibres are. Sisal can have long or short fibres because it is extremely coarse and rigid. Because of its strength, toughness, stretch ability, compatibility with some colours, and resilience to degradation in saline water, sisal is prized for use as cordage. Sisal can be fashioned into carpets, mats, and a variety of handicrafts in addition to its traditional applications as rope, ropes, string, and yarn. Characteristics The feed can be adjusted to modify the chip's thickness. Because tungsten carbide drills have excellent anti-wear properties, they were chosen in the current experimental study to prevent the impact of tool wear mostly on chip production characteristics Natural and synthetic fibres typically have a diameter between 7 and 20 m. A finer range of 3–7 microns is possible with the use of microfiber towels and component split fibres. There are four different types of multimode fibre: OM1 (62.5/125 m), OM2, OM3, and OM4 (50/125 m). Multimode fibre is available in either diameters, 62.5 or 50 mm. The single mode core has a 9 m diameter. Sheath diameter for both fibre kinds is 125 m, or microns. Break elongation (%) The ratio of the length altered after that the experiment specimen breaks to the initial length is known as elongation at break, often referred to as strain at break. It illustrates how naturally occurring plant fibre can withstand form changes without cracking. The term "elongation at break" describes how much Before breaking, a material can lengthen by a certain percentage of its initial dimensions. It quantifies the extent to which a component deforms plastically and being the up to fractures and is also known as percentage elongation. The amount of elongation a capable of resisting before breaking is known as elongation at break. Ratio studies are statistical analyses of data from appraisals and property valuations. Nearly all states utilise them to produce quantitative measure of the proportion of current market price about which individually estimated taxable property is appraised as well as to offer assessment performance indicators. Fiber diameter (mm), Water content (%), Tensile strength(MPa), Tensile modulus(GPa) and Elongation at break (%) The Cronbach's Alpha Reliability result. The overall Cronbach's Alpha value for the model is .658 which indicates 66% reliability. From the literature review, the above 50% Cronbach's Alpha value model can be considered for analysis.

REFERENCES

1. Debnath, Kishore, Inderdeep Singh, and Akshay Dvivedi. "Drilling characteristics of sisal fiber-reinforced epoxy and polypropylene composites." Materials and Manufacturing Processes 29, no. 11-12 (2014): 1401-1409.
2. Benítez-Guerrero, Mónica, Luis A. Pérez-Maqueda, Ramón Artiaga, Pedro E. Sánchez-Jiménez, and José Pascual-Cosp. "Structural and chemical characteristics of sisal fiber and its components: Effect of washing and grinding." Journal of Natural Fibers 14, no. 1 (2017): 26-39.
3. Wongsorat, Wittawat, Nitinat Suppakarn, and Kasama Jarukumjorn. "Effects of compatibilizer type and fiber loading on mechanical properties and cure characteristics of sisal fiber/natural rubber composites." Journal of Composite Materials 48, no. 19 (2014): 2401-2411.
4. Sreekumar, P. A., Selvin P. Thomas, Jean marc Saiter, Kuruvilla Joseph, G. Unnikrishnan, and Sabu Thomas. "Effect of fiber surface modification on the mechanical and water absorption characteristics of sisal/polyester composites fabricated by resin transfer molding." Composites Part A: Applied Science and Manufacturing 40, no. 11 (2009): 17771784.
5. Devaraju, A., and P. Sivasamy. "Comparative analysis of mechanical characteristics of sisal fibre composite with and without nano particles." Materials Today: Proceedings 5, no. 6 (2018): 14362-14366.
6. Wongsorat, Wittawat, Nitinat Suppakarn, and Kasama Jarukumjorn. "Mechanical properties, morphological properties, and cure characteristics of sisal fiber/natural rubber composites: effects of fiber and compatibilizer content." In Advanced Materials Research, vol. 123, pp. 1171-1174. Trans Tech Publications Ltd, 2010.
7. Xie, Xin, Zhiwei Guo, and Chengqing Yuan. "Investigating the water lubrication characteristics of sisal fiber reinforced ultrahigh‐ molecular‐ weight polyethylene material." Polymer Composites 41, no. 12 (2020): 5269-5280.
8. Jacob, Maya, K. T. Varughese, and Sabu Thomas. "Dielectric characteristics of sisal–oil palm hybrid biofibre reinforced natural rubber biocomposites." Journal of materials science 41 (2006): 5538-5547.
9. Ferreira, Saulo Rocha, Paulo Roberto Lopes Lima, Flávio Andrade Silva, and Romildo Dias Toledo Filho. "Effect of sisal fiber hornification on the fiber-matrix bonding characteristics and bending behavior of cement based composites." In Key Engineering Materials, vol. 600, pp. 421-432. Trans Tech Publications Ltd, 2014.
10. Sharma, Ankita, S. Suresh, and Amit Dubey. "Properties and characteristics of sisal fibre reinforced composite." In Advanced Materials Research, vol. 585, pp. 322-326. Trans Tech Publications Ltd, 2012.
11. Dizbay-Onat, Melike, Uday K. Vaidya, and Claudiu T. Lungu. "Preparation of industrial sisal fiber waste derived activated carbon by chemical activation and effects of carbonization parameters on surface characteristics." Industrial crops and products 95 (2017): 583-590.
12. Munde, Yashwant S., Ravindra B. Ingle, and I. Siva. "Vibration damping and acoustic characteristics of sisal fibre–reinforced polypropylene composite." Noise & Vibration Worldwide 50, no. 1 (2019): 13-21.
13. Megiatto Jr, Jackson D., Cristina G. Silva, Derval S. Rosa, and Elisabete Frollini. "Sisal chemically modified with lignins: correlation between fibers and phenolic composites properties." Polymer Degradation and Stability 93, no. 6 (2008): 1109-1121.
14. Samouh, Zineb, Kolos Molnar, François Boussu, Omar Cherkaoui, and Reddad El Moznine. "Mechanical and thermal characterization of sisal fiber reinforced polylactic acid composites." Polymers for Advanced Technologies 30, no. 3 (2019): 529-537.
15. Li, Yan, and Yiu-Wing Mai. "Interfacial characteristics of sisal fiber and polymeric matrices." The journal of adhesion 82, no. 5 (2006): 527-554.
16. Jacob, Maya, Sabu Thomas, and K. T. Varughese. "Natural rubber composites reinforced with sisal/oil palm hybrid fibers: Tensile and cure characteristics." Journal of applied polymer science 93, no. 5 (2004): 2305-2312.
17. Michael, D. Peter, S. Harish, A. Bensely, and D. Mohan Lal. "Insulation characteristics of sisal, human hair, coir, banana fiber composites at cryogenic temperatures." Polymers from Renewable Resources 1, no. 1 (2010): 47-56.
18. Megiatto Jr, Jackson D., Franciéli B. Oliveira, Derval S. Rosa, Christian Gardrat, Alain Castellan, and Elisabete Frollini. "Renewable resources as reinforcement of polymeric matrices: composites based on phenolic thermosets and chemically modified sisal fibers." Macromolecular bioscience 7, no. 9‐ 10 (2007): 1121-1131.
19. Idicula, Maries, N. R. Neelakantan, Zachariah Oommen, Kuruvilla Joseph, and Sabu Thomas. "A study of the mechanical properties of randomly oriented short banana and sisal hybrid fiber reinforced polyester composites." Journal of applied polymer science 96, no. 5 (2005): 1699-1709.
20. Alemayehu, Zewdie, Ramesh Babu Nallamothu, Mekonnen Liben, Seshu Kishan Nallamothu, and Anantha Kamal Nallamothu. "Experimental investigation on characteristics of sisal fiber as composite material for light vehicle body applications." Materials Today: Proceedings 38 (2021): 2439-2444.

