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| 1. Title of the Technology: ANUGRAHA TEJAS Automatic power loom for Coir Geo Textiles | | | |
| Type(Green/ import substitution/etc) | Green | | |
| IP Status (IP Protected /Non infringing /freedom to practice) | Patent filed, Indian patent no.201741041316 dtd 18/11/2017 | | |
| Plant / Equipment/Space requirement for manufacturing | Motor Capacity – 3 HP Cops and bobbin winding – 2 HP Land area:250-300 sq ft Preparatory processing unit(Bobbin winding cops making etc) for installation of Anugraha Tejas loom. | | |
| | Anugraha Tejas | Capacity | Cost in Lakhs (INR) |
| CapEx | | 800 Sq m/day | 15.5 |
| | Anugraha Tejas | Capacity | Cost /Sqm (INR) |
| OpEx | | 800 Sq m /day | 70.00 |
| Market Size and Return on Investment time (Please indicate in numbers) | Small capacity: 4800 Rolls(50Sqm)/annum Large capacity:Depends on the investment for multiple looms ROI: 1-2 years (Small capacity) & 2-3 years(Large capacity) | | |
| Availability of raw materials | All the raw materials are easily in coconut growing states at reasonable cost | | |
| Product/ Equipment Certification status (Regulatory body/ user agency) | Patent designed and fabricated in CCRI | | |
| Unique selling Point | <ul style="list-style-type: none"> • “ANUGRAHA-TEJAS” fully automatic power loom is the upgraded and fully mechanized version of the semi automatic loom “ANUGRAHA” • Versatile loom which can be operationalized by male & female coir artisans • Output is 800 Sq.Mtr. per two shifts/ day of coir geotextile withwidth of 1 Meter • Easy maintenance • Simple in construction and operation • Produces fixed number of wefts per unit length which can be predetermined by a ratchet mechanism provided in the loom • Winding is carried out without stopping the weaving operation by the ratchet mechanism • The yarn is released automatically due to providing of a brake mechanism which releases warp yarn continuously from the warp beam • Beneficial to small scale and large scale coir units | | |
| Transfer of technology charges of the Lab | Micro: Upfront Fee of Rs 50,000 +Royalty of Rs 2.5% on | | |

MACHIRAJU KASHYAP

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| 2. Title of the Technology: Anupam Looms-Pneumatic loom for weaving Coir mats and matting, | | | |
| Type(Green/ import substitution/etc) | Green | | |
| IP Status (IP Protected /Non infringing /freedom to practice) | Patent Filed, Indian Patent No.228415 dtd23.12.2005 | | |
| TRL Status | 5-8(Demonstrated and Proven Successfully) | | |
| Plant / Equipment/Space requirement for manufacturing | Bobbin winding machine-1No Cops winding machine -1 No Anupam loom-1 no Land Area:250-300 Sqft | | |
| | | Capacity | Cost in lakhs (INR) |
| CapEx | Anupam | 6 mats/day | 10 |
| | | Capacity | Cost/mat(INR) |
| OpEx | Anupam | 6 mats/day | 400.00 |
| Market Size and Return on Investment time (Please indicate in numbers) | Small capacity:Per Loom -3600 mats /annum Large capacity: Depends on the investment for multiple looms ROI:2-3 years for 1 loom | | |
| Availability of raw materials | All the raw materials are easily in coconut growing states at reasonable cost | | |
| Product/ Equipment Certification status (Regulatory body/ user agency) | Patent designed and fabricated in CCRI | | |
| Unique selling Point | <ul style="list-style-type: none"> • Versatile loom which can be operationalized by male & female coir artisans • User friendly due to the ease of operation • Less maintenance expenditure • The pneumatic cylinders can be used for stenciling of the mats in different designs • Three controlling valves have been used to reduce the operating pressure to 300 gm for treadling instead of 30 kg required in traditional handloom • A pair of pneumatic cylinders is provided to move the sley for beating operation which minimizes the strain of beating. • It is also capable of weaving different kinds of coir products like coir mats such as rod mats, rod inlaid mat, Carnatic mat, creel mat, fibre mat, 3 shaft coir matting carpet and Geotextile whereas different | | |

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| | wooden loom is required. |
| Transfer of technology charges of the Lab for <ul style="list-style-type: none"> • Micro • Small • Medium Scale company | Micro: Upfront Fee of Rs.10000 +Royalty of Rs 2.5% on installation Small: Upfront Fee of Rs.15000 +Royalty of Rs 2.5% on installation Medium: Upfront Fee of Rs.25000 +Royalty of Rs2.5% on installation |
| Date of demonstration of technology | The demonstration available at CCRI working time. |

Contact details of the person

| Name | Designation | Lab Address | Phone No. (Landline/mobile) | Email Address |
|----------------------------|-------------------------------|--|--------------------------------|--------------------------|
| Dr. Das Anita Ravindranath | Director ,CCRI, RDTE,Kalavoor | Central Coir Research Institute, Kalavoor.P.O., Alappuzha, Kerala.688522 | 0477-2258094 | ccri.coirboard@gmail.com |

| 6. Title of the Technology – COIR CORRIDOR MAT | | | |
|--|--|-------------|---------------------|
| Type (Green/ import substitution/etc) | Green | | |
| IP Status (IP Protected /Non infringing /freedom to practice) | Not Patented | | |
| TRL Status | 8-9 (Demonstrated and proven successfully) | | |
| Plant / Equipment/Space requirement for manufacturing | Corridor mat Press, -1 No, Frame & iron rods, Eye Needles Land Area : 200-250SqFt | | |
| CapEx | | | |
| | | Capacity | Cost in lakhs (INR) |
| | Corridor Mat | 90 mats/day | 1,20,000.00 |
| OpEx | | Capacity | Cost (INR) |
| | Corridor Mat | 90 Mats/day | 80.00 |
| Market Size and Return on Investment time (Please indicate in numbers) | Small Capacity: 27000 mats/ annum Large Capacity: Depends on the Investment ROI : 1-2years (Small capacity) | | |
| Availability of raw materials | All the raw materials are easily available at reasonable cost | | |
| Product/ Equipment Certification status (Regulatory body/ user agency) | Designed and fabricated in CCRI. | | |
| Unique selling Point | <ul style="list-style-type: none"> • Ecofriendly , • Cost effective, • Green (Biodegradable)product | | |
| Transfer of technology charges of the Lab for <ul style="list-style-type: none"> • Micro • Small • Medium Scale company | Micro: Upfront Fee of Rs.2000.00 Small: Upfront Fee of Rs.3000.00 Medium: Upfront Fee of Rs.5000.00 | | |
| Date of demonstration of technology | The demonstration available at CCRI working time. | | |

Contact details of the person

| Name | Designation | Lab Address | Phone No. (Landline/mobile) | Email Address |
|---------------------------|-------------------------------|---------------------------------|-----------------------------|--------------------------|
| Dr.Anita Das Ravindranath | Director ,CCRI, RDTE,Kalavoor | Central Coir research Institute | 0477-2258094 | ccri.coirboard@gmail.com |

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| 10. Title of the Technology Process of Extraction of Sodium Lignosulphonate from Coir Pith | | | |
| Type (Green/Import Substitution/etc) | Low cost Import Substitute | | |
| IP status (IP Protected/Non Infringing/freedom to practice) | Patent Filed. Indian Patent No. 201841020488 dtd 31/05/2018 | | |
| TRL Status | 5-8 (Material production completed in lab scale method and proven through successful analysis of material characterization.) | | |
| Plant/Equipment/Space requirement for manufacturing | Digester-1 Distillation unit-1 Drying unit-1 Land requirement-2000 -3000 Sq Ft | | |
| | | Capacity | Cost in lakhs (INR) |
| CapEx | Sodium lignosulphonate | 50 Kg/ day | 125.5 |
| OpEx | | Capacity | Cost (INR) |
| | Sodium lignosulphonate | 50Kg/day | 4500.00 |
| Market size and | Small capacity: 18000Kg/annum Large capacity: Depends on the investment | | |
| Return of investment time (Please indicate in numbers) | ROI : 2-3 year (Small capacity) and 2-4 years (Large Capacity) | | |
| Availability of raw material | All the raw materials are easily available at reasonable cost | | |
| Product/Equipment Certification status (Regulatory Body/User agency) | Material Characterization were tested according to the standards | | |
| Unique Selling Point | <ul style="list-style-type: none"> • Sodium lignosulphonate from Coir pith is an import substitute • Lignosulfonates have a wide range of uses, • In Construction –As plasticizers in concrete admixtures • Additives in oil well drilling, • Animal feedbinders • Surfactants, • stabilizers in colloidal suspensions • Sodium Lignosulphonate from coir pith could be a cost effective import substitute and value addition to coir pith. | | |
| Transfer of Technology charges of the Lab for a) Micro b) Small c) Medium Scale company | Micro: Upfront fee of Rs2 lakhs +Royalty of Rs 2.5% on installation Small: Upfront fee of Rs3 lakhs +Royalty of Rs 2.5% on installation Medium: Upfront fee of Rs 5 lakhs +Royalty of Rs 2.5% on installation | | |
| Date for demonstration of technology | 01.03.2020-01.03.2021 (Lab scale production) | | |

| Name | Designation | Lab Address | Phone No.landline/Mobile | Email address |
|-------------------------------|---------------|---------------------------------------|-----------------------------|--------------------------|
| Dr. Das Anita Ravindranath | Director/RDTE | Central Coir research Institute | 0477 2258094 | ccri.coirboard@gmail.com |

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| 3. Title of the Technology: Coir fibre extraction using Mobile Fibre Extraction Machine (MFEM-Swarna) | | | |
| Type (Green/ import substitution/etc) | Green | | |
| IP Status (IP Protected /Non infringing /freedom to practice) | Patent Filed, Indian Patent Application No 286/KOL/2010 dt 22.03.2010 | | |
| Plant / Equipment/Space requirement for manufacturing | Motor Capacity 10HP to 12HP-1 No Diesel Engine or Electric motor for fiber extraction unit-1 No Land Area:200-250Sqft | | |
| CapEx | | Capacity | Cost in lakhs (INR) |
| | MFEM-Swarna | 350 Kg of Fibre+700 Kg of Pith/Day | 3 |
| &OpEx | | Capacity | Cost (INR) |
| | MFEM -Swarna | 350 Kg of Fibre+700 Kg of Pith/Day | 7000/Day |
| Market Size and Return on Investment time (Please indicate in numbers) | Small capacity: 10 Tonnes of Fibre/Day + 20 Tonnes of Coir Pith Large capacity: Depends upon the investment. ROI: 06-1 year (Small Capacity) | | |
| Availability of raw materials | All the raw materials are easily in coconut growing states at reasonable cost | | |
| Product/ Equipment Certification status (Regulatory body/ user agency) | Patent designed and fabricated in CCRI Bestowed with Best Innovation award by NRDC in the year 2010 and the prestigious World Intellectual Property Organization (WIPO) Gold medal in the year 2012. | | |
| Unique selling Point | <ul style="list-style-type: none"> • No pre-crushing of husk is required • Good quality of fibre with minimum breakage • Machine weight is only 500 Kg. • Dimensions 100cm X 1200 cm. • Defibering of 600 husks/hour • Saves transportation charges for husk • Generate more working days in rural sector • Up liftment of the economic status of coir artisans in the rural sector • Eliminate pollution of water bodies in rural area, only 1000 L of water required to be sprinkle over the husks. • Can be run by Diesel Engine or Electric Motor/ tillers and tractor extension shaft | | |
| Transfer of technology charges of the Lab for <ul style="list-style-type: none"> • Micro • Small • Medium Scale company | Micro: Upfront Fee of Rs.10000 +Royalty of Rs 2.5% on installation Small: Upfront Fee of Rs.15000 +Royalty of Rs 2.5% on installation Medium: Upfront Fee of Rs.25000 +Royalty of Rs2.5% on | | |

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| | installation |
| Date of demonstration of technology | The demonstration available at CCRI working time. |

Contact details of the person

| Name | Designation | Lab Address | Phone No. (Landline/mobile) | Email Address |
|-------------------------------|----------------------------------|---|--------------------------------|--------------------------|
| Dr. Das Anita Ravindranath | Director ,CCRI, RDTE,Kalavoor | Central Coir Research Institute, Kalavoor.P.O., Alappuzha, Kerala.688522 | 0477-2258094 | ccri.coirboard@gmail.com |

| 4. Title of the Technology: Mild steel Anugraha handloom for weaving Coir geotextiles | | | |
|--|--|------------|---------------|
| Type(Green/ import substitution/etc) | Green | | |
| IP Status (IP Protected /Non infringing /freedom to practice) | Patent Filed :Indian Patent No.222486dtd 02.07.2003 | | |
| Plant / Equipment/Space requirement for manufacturing | Bobbin winding machine-1No Cops winding machine -1 No Land Area:250-300 Sqft Preparatory processing unit(Bobbin winding cops making etc) for installation of Anugraha loom. | | |
| | | Capacity | Cost In lakhs |
| CapEx | Anugraha H ₂ M ₅ | 50Sqm/day | 2.5 |
| OpEx | | Capacity | Cost |
| | Anugraha H ₂ M ₅ | 50 Sqm/day | 2000.00/Day |
| Market Size and Return on Investment time (Please indicate in numbers) | Small capacity: 18750Sqm/annum Large capacity: Depends on the investment for multiple looms ROI: 1-2 years for 1 loom | | |
| Availability of raw materials | All the raw materials are easily in coconut growing states at reasonable cost | | |
| Product/ Equipment Certification status (Regulatory body/ user agency) | Patent designed and fabricated in CCRI Bestowed with Best Innovation award by NRDC in 2004 | | |
| Unique selling Point | <ul style="list-style-type: none"> • Versatile loom which can be operationalized by male & female coir artisans • User friendly due to the ease of operation • Less maintenance expenditure • Panama matting, Ribbed Matting, rod mat, rod inlaid mat and carpet mat can also be manufactured using Anugraha Loom with minor arrangements. • Winding is carried out without stopping the weaving operation by the ratchet mechanism. • The yarn is released automatically due to providing of a brake mechanism which releases warp yarn continuously from the chain beam. • It can be operated by single woman worker. • Due to its light weight, it can be easily shifted from one place to another. | | |

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| Transfer of technology charges of the Lab for <ul style="list-style-type: none"> • Micro • Small • Medium Scale company | Micro: Upfront Fee of Rs.10000 +Royalty of Rs 2.5% on installation Small: Upfront Fee of Rs.15000 +Royalty of Rs 2.5% on installation Medium: Upfront Fee of Rs.25000 +Royalty of Rs2.5% on installation |
| Date of demonstration of technology | The demonstration available at CCRI working time. |

Contact details of the person

| Name | Designation | Lab Address | Phone No. (Landline/mobile) | Email Address |
|----------------------------------|----------------------------------|--|--------------------------------|--------------------------|
| Dr. Das Anita Ravindranath | Director ,CCRI, RDTE,Kalavoor | Central Coir Research Institute (CCRI) Kalavoor,Alleppey. | 0477-2258094 | ccri.coirboard@gmail.com |

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| 5. Title of the Technology : A process of Preparation of Coir Composite Boards | | | |
| Type(Green/Import Substitution/etc) | Green Substitute | | |
| IP status(IP Protected/Non Infringing/freedom to practice) | Patent Filed. Indian patent No.240751dtd 10/03/2003 | | |
| TRL Status | 5-8(Coir Composite Boards qualified and proven through successful operations) | | |
| Plant/Equipment/Space requirement for manufacturing | Coir pith & resin mixing machine – 1 No Coir felt Machine – 1 No Coir Felt impregnation machine with online drier – 1 No Hot compression moulding machine – 1 No Edge trimming machine – 1 No Boiler & Misc-1 No Building Area– 20000 Sq Ft | | |
| CapEx | | Capacity | Cost in Lakhs (INR) |
| | Coir Composite Boards | 28800 panels/annum | 361.45 |
| | | Capacity | Cost in Lakhs |
| OpEx | Coir Composite Boards | 96panels/day | 26.4 /month |
| Market size and Return of investment time(Please indicate in numbers) | Small capacity-25 panels/day Large Capacity-100-150 panels/day ROI : 1-2 years for Small capacity and 3-5 years for Large Capacity | | |
| Availability of raw material | Raw materials are easily available | | |
| Product/Equipment Certification status(Regulatory Body/User agency) | Coir Composite Boards are tested according to BIS standards | | |
| Unique Selling Point | <ul style="list-style-type: none"> • From the market study, the builder community and the vendors are really positive on the market acceptance of the coir composite boards. • Coir and Jute are the most preferred natural fibers in the market. The products that are made using these fibers are accepted more than any other natural fiber based products. • Coir based furnishing and building products are rated highly by the market.it clearly indicates a good future for coir based innovative products. • The Ecofriendly trend in the market is great news for the making industries.The boom in the construction industry also adds up to the demand for natural fibre based products.Coir based boards are as good as the wood based products in durability quality longevity and finish. • Coir composite Boards are going to be next trend in the market. As the market is maturing to ecofriendly products, coir and other natural fibres have a big role to play. | | |

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| Transfer of Technology charges of the Lab for a) Micro b) Small c) MediumScale company | Micro: Upfront Fee of Rs10 Lakhs +Royalty of Rs 2.5% on Installation Small:Upfront Fee of Rs15 Lakhs +Royalty of Rs 2.5% on Installation Medium:Upfront Fee of Rs20 Lakhs +Royalty of Rs 2.5% on Installation |
| Date for demonstration of technology | 01.03.2020 -01.03.2021 |

| Name | Designation | Lab Address | Phone No.landline/Mobile | Email address |
|--------------------------|---------------|--|--------------------------|--------------------------|
| Dr. DasAnita Ravindranth | Director/RDTE | Central Institute Coir Technology Bangalore. | 0477-2258094 | ccri.coirboard@gmail.com |

| 7. TITLE OF THE TECHNOLOGY- MESH MAT | | | |
|--|--|-------------|------------------|
| Type(Green/ import substitution/etc) | Green | | |
| IP Status (IP Protected /Non infringing /freedom to practice) | Not Patented | | |
| TRL Status | 8-9 (Demonstrated and proven successfully) | | |
| Plant / Equipment/Space requirement for manufacturing | Frames -6 Nos Eye Needles Land Area : 100SqFt | | |
| CapEx | | Capacity | Cost (INR) |
| | Mesh Mat | 24 Mats/day | 10000.00 |
| OpEx | | Capacity | Cost/Piece (INR) |
| | Mesh Mat | 24 Mats/day | 125.00 |
| Market Size and Return on Investment time (Please indicate in numbers) | Small Capacity: 7200 Mats/ annum Large Capacity: Depends on the Investment ROI : 06-1year (Small capacity) | | |
| Availability of raw materials | All the raw materials are easily available at reasonable cost | | |
| Product/ Equipment Certification status (Regulatory body/ user agency) | Designed and fabricated in CCRI. | | |
| Unique selling Point | <ul style="list-style-type: none"> • Ecofriendly , • Cost effective, • Green (Biodegradable)product | | |
| Transfer of technology charges of the Lab for <ul style="list-style-type: none"> • Micro • Small • Medium Scale company | Micro: Upfront Fee of Rs.2000/- Small: Upfront Fee of Rs.3000/- Medium: Upfront Fee of Rs.5000 /- | | |
| Date of demonstration of technology | The demonstration available at CCRI working time. | | |

Contact details of the person

| Name | Designation | Lab Address | Phone No. (Landline/mobile) | Email Address |
|---------------------------|-------------------------------|---------------------------------|-----------------------------|--------------------------|
| Dr.Anita Das Ravindranath | Director ,CCRI, RDTE,Kalavoor | Central Coir research Institute | 0477-2258094 | ccri.coirboard@gmail.com |

| 9. Title of Technology :A process of preparation of Coir pith Organic Manure | | | |
|--|--|------------|---------------------|
| Type (Green / import substitution / etc) | Green substitute | | |
| IP Status (I P Protected /Noninfringing / freedom to practice) | Patent Filed: Indian Patent No.208580 dtd 06/04/1998 | | |
| TRL status | 5-8 (Demonstrated and proven successful for over 15 years) | | |
| Plant / Equipment / Space requirement for manufacturing | Rotary Sifter-1No Refrigerator-1No Motor(1HP)-1No Weighing balance-1No Stitching Machine-1No Land requirement-20,000-25,000Sqft | | |
| | | Capacity | Cost in Lakhs (INR) |
| CapEx | C-POM | 5 Ton/ day | 7 |
| | | Capacity | Cost (INR) |
| OpEx | C-POM | 5 Ton/day | 5000.00 |
| Market size and Return on Investment time (Please indicate in numbers) | Small capacity: 720 Tonnes/annum Large capacity: Depends on the Investment ROI : 1Year(Small capacity) Large capacity depends on the investment | | |
| Availability of raw materials | All raw materials are easily available | | |
| Product / Equipment Certification status (Regulatory body / user agency) | Certification underway through ICAR | | |
| Unique selling Point | <p>“C-Pom” is coir pith organic manure which is prepared by bioconversion of coir pith using “PITHPLUS” a lignolytic mushroom spawn. This leads to increasing its nutrient status making its most suitable for Agri/horti use.</p> <ul style="list-style-type: none"> • Excellent air porosity • Excellent water retention • Irrigation efficiency • Faster germination times and quicker seeding rotations • Suitable for soil remediation • Provides phytohormones • C-Pom has Carbon/Nitrogen ratio of 24:1 which is ideal for organic manure. | | |
| Transfer of technology charges of the Lab for a. Micro b. Small c. Medium Scale company | Micro: Upfront fee of Rs. 3500.00 Small: Upfront fee of Rs. 7500.00 Medium: Upfront fee of Rs. 10000.00 | | |
| Date for demonstration of technology | 01.03.2020 to 31.03.2021 | | |

Contact details of the person

| Name | Designation | Lab Address | Phone No. | Email Address |
|---------------------------|---------------|---|-----------------------|------------------------|
| Dr.Das Anita Ravindranath | Director RDTE | Central Coir Research Institute, Coir Board, Kalavoor.P.O, Alappuzha, Kerala -688 522 | 0477-2258094, 2258480 | ccrikalavoor@gmail.com |

| 8. TITLE OF THE TECHNOLOGY – COIR ROPE MAT | | | |
|--|--|-------------|------------------|
| Type(Green/ import substitution/etc) | Green | | |
| IP Status (IP Protected /Non infringing /freedom to practice) | Not Patented | | |
| TRL Status | 8-9 (Demonstrated and proven successfully) | | |
| Plant / Equipment/Space requirement for manufacturing | RopRatt set Table with nails Hand Tools Land Area 200-250SqFt. | | |
| CapEx | | Capacity | Cost (INR) |
| | Rope Mat | 15 mats/day | 50000.00 |
| OpEx | Rope Mat | Capacity | Cost/piece (INR) |
| | | 15 Mats/day | 120.00 |
| Market Size and Return on Investment time (Please indicate in numbers) | Small capacity: 4500mats /annum Large capacity: Depends on the investment ROI: 06-1 year | | |
| Availability of raw materials | All the raw materials are easily in coconut growing states at reasonable cost | | |
| Product/ Equipment Certification status (Regulatory body/ user agency) | Designed and fabricated in CCRI. | | |
| Unique selling Point | <ul style="list-style-type: none"> • Ecofriendly , • Cost effective, • Green (Biodegradable)product | | |
| Transfer of technology charges of the Lab for <ul style="list-style-type: none"> • Micro • Small • Medium Scale company | Micro: Upfront Fee of Rs.2000/- Small: Upfront Fee of Rs.3000 /- Medium: Upfront Fee of Rs.5000/- | | |
| Date of demonstration of technology | The demonstration available at CCRI working time. | | |

Contact details of the person

| Name | Designation | Lab Address | Phone No. (Landline/mobile) | Email Address |
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| Dr.DasAnita Ravindranath | Director ,CCRI, RDTE,Kalavoor | Central Coir research Institute | 0477-2258094 | ccri.coirboard@gmail.com |