



## **COIR SPINNING PLANT MACHINERY DEVELOPMENT PROJECT**

**Funded by Coir Board (Ministry of MSME), Govt. of India**

**Project Title:** Development of Coir Processing Machinery for Spinning of Fine Quality of Coir Yarn of Uniform Thickness and Reduced Hairiness

MoU Signed Date: 10.06.2017

Fund Allotted : Rs.2.99 Crores

### **Scope for Commercialisation of machines developed under the project**

1. For Commercialisation of Prototype machines developed under the project LMW will involve (Ref Point No: 1.3 in 1.Preamble in MoU)
2. Dr.M.G.R University in Cooperation with the board may also arrange to transfer the technologies developed under this project to coir entrepreneurs. (11. Result of the Project Activities Point No:4 in MoU)
3. The Fees received on account of the technology transfer shall be shared between the Board and Dr.M.G.R University on 50:50 basis including tax. (11. Result of the Project Activities Point No:6 in MoU)



## कयर बोर्ड COIR BOARD

सूक्ष्म, लघु और मध्यम उद्यम मंत्रालय, (भारत सरकार)  
Ministry of Micro, Small and Medium Enterprises,  
केन्द्रीय कयर अनुसंधान संस्थान  
CENTRAL COIR RESEARCH INSTITUTE

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सी.सी.आर.आई/अनुसं/ परियोजना-एमजीआरयु/2016-17/3/17 / 287  
CCRI/Res/PROJECT-MGRU/2016-17/3/17

13.06.2017

डा. पी. पलानीसामी, पीएचडी /Dr. P. Palanisamy, Ph. D.

डीन - एआरआई/Dean - ARI

डा. एमजीआर शैक्षिक और अनुसंधान संस्थान विश्वविद्यालय /

Dr. MGR. Educational & Research Institute University,

मदुरावोल /Maduravoyal, चेन्नई /Chennai 600 095

तमिलनाडु/TAMILNADU.

महोदय/Sir,

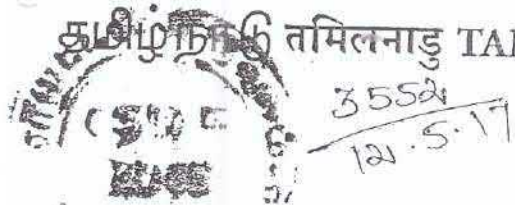
विषय/Sub:- "Development of Coir Processing Machinery for Spinning of Fine Quality of  
Coir Yarn of Uniform Thickness and Reduced Hairiness" with Dr.MGR  
University, Chennai & LMW, Coimbatore -MoU fdg-reg.

कृपया उपरोक्त विषय देखें. इस संबंध में विधिवत हस्ताक्षरित समझौता ज्ञापन की प्रति आपके  
सूचना के लिए इसके साथ आगे भेजा गया है।

Please refer to the subject cited. In this connection the copy of the duly signed MoU  
is forwarded herewith for your reference.

भवदीय/Yours faithfully,

निदेशक आर.डी.टी.ई./DIRECTOR, R.D.T.E.



Dr. M. G. R.  
EDUCATIONAL AND RESEARCH INSTITUTE  
UNIVERSITY.

BL 957227

R. LAKSHMANAN  
STAMPVENDOR  
L C No 6/772/B3/96  
No 261, EVR ROAD,  
AMINJIKARAI, CHENNAI-25

### MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called MoU) is made on this *Tenth* day of *June* Two Thousand and Seventeen between COIR BOARD, (coming under the Ministry of MS&ME, Govt. of India), Coir House, M.G.Road, Kochi 682 016 (hereinafter called "the Board" which expression shall include its successors in interest and permitted assigns) on the one part

AND

Advanced Research Institute (ARI), Dr. M. G. R. Educational & Research Institute University, Chennai-600 095 (hereinafter called Dr. M. G. R. University which expression shall include its successors in interest/business and permitted assigns) on the other part on the collaborative project "Development of Plant Machinery and Control Systems to Spin Fine Quality Coir Yarn of Uniform Thickness and Reduced Hairiness for Weaving Superior Quality Coir Floor Furnishing Products".

IN ASSOCIATION WITH

LAKSHMI MACHINE WORKS (LMW), Perianaickenpalayam, Coimbatore-20



## 1. THE PREAMBLE

WHEREAS the Board is a statutory body set up by Government of India for the development of coir industry in India including research and development in the field of coir processing and invited Expression of Interest from interested educational Institutions and research organizations for Development of plant machinery and control systems to spin fine quality coir yarn of uniform thickness and reduced hairiness for weaving superior quality coir floor furnishing products.

WHEREAS Dr. M. G. R. University, conducting education, research and extension of all Technological, management and all allied research in India for the promotion and development of modern technology and management had expressed interest in taking up a collaborative research project on the subject from Coir Board.

WHEREAS the Board and Dr. M. G. R. University agreed to co-operate in the development of technologies for the Development of plant machinery and control systems to spin fine quality coir yarn of uniform thickness and reduced hairiness for weaving superior quality coir floor furnishing products.

1.1. WHEREAS Dr. M. G. R. University has agreed to take up the project for the Board in association with LMW.

1.2. WHEREAS Dr. M. G. R. University is in need of financial support to supplement its own resources for taking up the collaborative research project for development of plant machinery and control systems to spin fine quality coir yarn of uniform thickness and reduced hairiness for weaving superior quality coir floor furnishing products and submitted a detailed project proposal to the BOARD, seeking financial grant of the project cost of Rs. 2.99 Crores as indicated in Annexure 1 to this agreement.

1.3 WHEREAS LMW will share their vast expertise and experience in the field of development of coir spinning machinery and also for commercialization of the prototype machine developed under the project.

1.4. WHEREAS the Board after giving careful consideration to the project proposal and recognizing the need for the development of plant machinery and control systems to spin fine quality coir yarn of uniform thickness and reduced hairiness for weaving superior quality coir floor furnishing products, in collaboration with Dr. M. G. R. University and LMW has approved it for a period of two years.

NOW, THEREFORE, in consideration of the premises and mutual covenants hereinafter contained, Dr. M. G. R. University", LMW and the BOARD hereby agree as follows:

## 2. SCOPE OF THE AGREEMENT

This agreement covers the modalities of executing the project for the Development of Plant Machinery and Control Systems to Spin Fine Quality Coir Yarn of Uniform Thickness and Reduced Hairiness for Weaving Superior Quality Coir Floor Furnishing Products from Dr. M. G. R. University, modalities of collaboration, intellectual property rights, responsibilities and obligations

of the collaborating parties etc pertaining to the PROJECT.

### 3. AMENDMENTS TO THE AGREEMENT

No amendment or modification of this Agreement shall be valid unless the same is made in writing by all the three Parties or by their authorized representatives, specifically stating the same to be an amendment of this Agreement. The modifications/changes shall be effective from the date on which they are made/ executed unless otherwise agreed to by the Parties by mutual consent.

The rights and/or liabilities arising to any party to this Agreement shall not be assigned except with the written consent of the other Parties and subject to such terms and conditions as may be agreed upon.

### 4. PROJECT REPORT

The detailed project proposal for the Development of Plant Machinery and Control Systems to Spin Fine Quality Coir Yarn of Uniform Thickness and Reduced Hairiness for Weaving Superior Quality Coir Floor Furnishing Products which was submitted by Dr. M. G. R. University to the Board and which is enclosed as Annexure I to this Agreement will form an integral part of this MoU and the basis for executing the Project.

### 5. EFFECTIVE DATE OF COMMENCEMENT, DURATION AND TERMINATION OF THE PROJECT

The effective date of commencement of the project will be the date on which agreement is signed.

The duration of the project will be 18 months from the date of signing this agreement followed by 6 months for incubation.

This Agreement shall be deemed to expire on completion of the project, unless all the Parties concerned extend it by mutual consent.

Any party may at any time terminate this agreement by giving three months notice in writing to the other parties.

### 6. PROJECT/TECHNICAL REVIEW & STEERING COMMITTEE

The Project/Technical Review Committee consisting of Director, R.D.T.E., Joint Director (Tech.), DD S&T & nominees of Dr. M. G. R. University, namely, 1. Dr. P. Aravindan, Principal Director (R&D), 2. Dr. P. Palanisamy, Dean-ARI, and 3. Dr. V. Natarajan, National Consultant (Coir Board Project) & nominee of LMW Shri. R. Dakshinamoorthy, Deputy General Manager (R&D – Product Engineering) constituted by mutual discussions and agreement to assist the Parties here to in the implementation of the project, shall continue to exist for the extended period of the project as well. The Director, CCRI will be the Project coordinator of this project. The Joint Director (Tech) CICT will be the Nodal Officer of this Project.

The Project/Technical Review Committee shall meet periodically (at least once in three months) at Dr. M. G. R. Educational & Research Institute University and review the project and recommend for release of Board's share for conducting the project.



The Steering Committee headed by the Chairman, Coir Board, Secretary, Coir Board, Shri. V.R. Prasad, MD, TMMC, Chairman, FICEA, Shri. C.R. Devaraj, MD, Charangattu Coir Manufacturing Company Private Limited shall meet as and when required to review the report of the Project/Technical Review Committee and to consider the recommendation of release of funds.

## **7. FINANCIAL ARRANGEMENTS**

7.1 In consideration of the ACTIVITY on Board's behalf, the Board will pay to Dr. M. G. R. Educational & Research Institute University, a sum of Rs. 2.99crores in the following manner:

### **7.1.a Mode of payment to Dr. M. G. R. Educational & Research Institute University**

- i) Rs.1.00crore/- - On signing the MoU
- ii) Rs. 1.00crore/- - At the end of 1 year from the date of signing of MoU and upon receipt of the utilization certificate, report on the progress of the project and review of the progress by the Project/Technical Review Committee and further review of the same by the Steering Committee.
- iii) Rs. 99lakhs/- - At the end of 18 months and upon receipt of the utilization certificate, review of the progress by the Review Committee and after submission of the Final Report with a successful conclusion and further review of the same by the Steering Committee.

Contributions by Dr. M. G. R. Educational & Research Institute University:

Dr. M. G. R. Educational & Research Institute University will contribute to the project by way of extending the infrastructure facilities like building, plant & equipments.

## **8. GENERAL CONDITIONS ON PROJECT FUNDS**

The funds received for the Project shall not be diverted to any other purpose other than the Project.

Dr. M. G. R. University shall be paid the expenditure to be met by LMW for the project.

No amounts whatsoever, other than those set out in this Clause, shall be payable by the Board to Dr. M. G. R. University and the liability of the Board shall be restricted to the amounts mentioned in this Clause.

Dr. M. G. R. University shall maintain proper accounts for all the funds received for the Project and all expenses shall be incurred in accordance with the general financial rules and regulations of Dr. M. G. R. University.

On completion of the Project, Dr. M. G. R. University shall furnish the accounts of the project to the Board for its information and record.

Dr. M. G. R. University undertakes to transfer all machinery if any developed and equipments procured under the project to the Board on completion of the project.

## **9. RESPONSIBILITIES OF DR. M. G. R. EDUCATIONAL & RESEARCH INSTITUTE UNIVERSITY FOR EXECUTING THE PROJECT.**

The responsibilities on the part of Dr. M. G. R. University will be as detailed hereunder:

- Development of Plant Machinery and Control Systems to Spin Fine Quality Coir Yarn of Uniform Thickness and Reduced Hairiness for Weaving Superior Quality Coir Floor Furnishing Products
- Prepare prototypes of coir spinning machines for producing yarn for manufacture of Coir mattings, Carpets, Geotextiles, diversified blended coir/natural fibre products etc.
- To design and build a prototype spinning system conducive for commercialization by LMW, Coimbatore.

The responsibilities on the part of the LMW will be as detailed hereunder:

- To assist the R&D project team as and when required at various stages to bring out the prototype spinning system for commercial production.

## **10. RESPONSIBILITIES OF THE BOARD**

The responsibilities on the part of the Board will be as follows:

To assist and support Dr. M. G. R. University & LMW for the speedy implementation of the Project, including the release of sanctioned grants, as provided for in this Agreement.

To extend its existing expertise, facilities and services to carry out the research studies.

## **11. RESULT OF THE PROJECT ACTIVITIES**

The intellectual property, ie., know how/process and patents, generated in the course of execution of the project shall be jointly owned by Dr. M. G. R. Educational & Research Institute University and the Board.

The procedural formalities for securing maintaining protecting and taking such measure as may be necessary for the prevention of infringement of the intellectual property rights, if any, shall be the responsibility of Dr. M. G. R. University.

Dr. M. G. R. University and the Board shall have the first option to commercially exploit the intellectual property rights generated under the Project.

Dr. M. G. R. University in cooperation with the Board, may also arrange to transfer the technologies developed under this project to Coir entrepreneurs.

The terms and conditions for technology transfer and the fees to be levied therefore shall be decided by the parties hereto by mutual discussions and consent.

The fees received on account of technology transfer shall be shared between the Board and Dr. M. G. R. University on 50:50 basis including taxes.

Dr. M. G. R. University shall be responsible for imparting practical training to those to whom the technologies have been transferred on payment of actual expenses incurred on providing such services.



The findings of the study will be the joint property of the Board and Dr. M. G. R. University Kochi and the Board will be free to use the findings of the study to the advantage of the Coir Industry.

Any publication/patent arising out of the research project should be published jointly by Dr. M. G. R. University and the Board.

Allocation, appropriation and re-appropriation of the fund as the Board's share shall be according to the direction of the Technical Committee. If any contingency arises, re-appropriation/ allocation of the funds can be permitted by Dr. M. G. R. University authorities subject to the condition that such re-appropriation/ allocation shall not exceed the total allocation of the funds earmarked for a financial year of the project. However, such re-appropriation/ allocation should be ratified by the Steering committee at the recommendation of the Project/Technical Committee in the subsequent meeting.

Periodic reports will be submitted by the University and the final report will be furnished to the Board within three months from the date of termination of the project.

On conclusion of the project Dr. M. G. R. University shall submit a report on the entire drawings, design and process technology developed during the study.

The scientists involved from Dr. M. G. R. University and the Board will have the right to use the research data for publication in the research journals/seminars following the accepted norms of Dr. M. G. R. University and the Board.

All research publications arising out of this project should have proper acknowledgement of the financial support of the Board.

The machinery/ equipments if any procured by utilizing the funds released by the Board will be handed over to the Board by Dr. M. G. R. University on completion of the project.

## **12. FORCE MAJEURE**

Neither Party shall be held responsible for non-fulfillment of their respective obligations under this Agreement due to the exigency of one or more of the Force Majeure events, such as but not limited to Act of God, war, floods, earthquakes, strikes, lockouts, epidemics, riots, civil commotion etc., provided on the occurrence and cessation of any such events the Party affected thereby shall give a notice in writing to the other PARTY within one month of such occurrence or cessation. If the Force Majeure conditions continue beyond six months, the parties shall then mutually decide about the future course of action.

## **13. NOTICES**

13.1 All notices and other communications required to be serviced on Dr. M. G. R. University under the terms of this Agreement, shall be considered as duly served if the same shall have been delivered to, left with or posted by registered mail at the known address of business.



13.2 Similarly, any notice to be given to the Board shall be considered as duly served if the same shall have been delivered to, left with or posted by registered mail to the Board at its registered address herein mentioned in this Agreement.

#### 14. ARBITRATION

14.1 All disputes relating to the execution of the project or to the interpretation of the clauses of this MoU for the implementation of the project or on account of any other reasons whatsoever shall be settled amicably before the Chairman, Coir Board.

14.2 However, in the unlikely event of any dispute or disputes remaining unresolved even after mutual discussions, such dispute or disputes may be referred to an Arbitrator to be appointed by the Parties hereto by mutual agreement. If no such Arbitrator could be appointed by mutual consent, the matter may then be referred to the Ministry of MSME, Govt. of India, for nominating an Arbitrator. The Arbitration proceedings shall be governed by the Arbitration and Conciliation Act 1996. The venue of Arbitration shall be at Cochin and the Courts in Cochin shall have exclusive jurisdiction over any application that may be filed by any of the parties in this agreement in relation to any dispute arising out of or in the course of or in connection with the agreement and also in respect of any application under the provisions of Arbitration and Conciliation Act 1996.

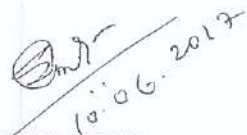
14.3 It is hereby agreed by the Parties hereto that the decisions of the Arbitrator so appointed under the provisions of clause 14.2 shall be final and binding on the Parties.

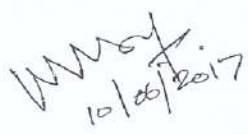
In witness whereof the parties hereto have signed this MoU on the day, month and year mentioned here before


For and on behalf of the  
BOARD

For and on behalf of  
Dr. M. G. R. UNIVERSITY

For and on behalf of  
LMW

  
DIRECTOR, RDTE  
(SEAL)

  
DEAN  
ARI, Dr. MGR- University  
(SEAL)

  
CHIEF FINANCIAL OFFICER  
(SEAL)

डॉ दास अनिता रवींद्रनाथ  
Dr. DAS ANITA RAVINDRANATH

निदेशक आर डी टी ई Director R.D.T.E  
केंद्रीय कयूर अनुसंधान संस्थान Central Coir Research Institute  
कयूर बोर्ड, कलवूर पी ओ Coir Board, Kalavoor P.O.  
आलप्पुझा - 688 522 Alappuzha-688 522

Dr. P. Palanisamy, B.E., (PSG-Tech), M.Tech., (IIT-M), Ph.D. (IISc.)  
Dean

Advanced Research Institute (ARI)  
Dr. M.G.R.  
Educational and Research Institute  
UNIVERSITY  
(Decl. u/s.3 of UGC Act, 1956)  
Maduravoyal, Chennai - 600 095.

Witness:

Witness:

**Item No.( ): Report on the progress of collaborative project “Development of Process & Machinery for Spinning of Fine Quality Yarn of Uniform Thickness and Reduced Hairiness” executed with Dr. MGR University, Chennai in association with LMW, Coimbatore.**

It may please be noted that the Board in its 224<sup>th</sup> meeting held on 10.06.2017 has signed an MoU with Dr. MGR University, Chennai for the collaborative project “Development of Process & Machinery for Spinning of Fine Quality Yarn of Uniform Thickness and Reduced Hairiness”. The total budget of the project is Rs.2.99 Cr. and the duration of the project was 18 months with 6 months incubation which further extended up to March 2020. The objective of the project is to develop process & machinery for spinning of fine quality yarn of uniform thickness and reduced hairiness for producing yarn for mattings, Carpets, Geotextiles & blended coir products etc. The specification of coir yarn has been finalised after consultation with the end-users of coir yarn and members of Federation of Indian Coir Exporters Association (FICEA).

### **Concept of plant machinery developed under the project**

First time in the World our University has developed a Coir spinning Pilot Mill similar to cotton Spinning Mill. In the Pilot Plant in addition to Coir Spinning Machine, Pre-Processing and Post Processing Machines are fabricated to produce Quality Yarn.

**Fabrication of this pilot plant machinery with 11 types of machines is completed and is in the stage of fine-tuning.**

**The sequence of machine operation in pilot Coir Spinning Mill are as follows**

#### **1. Willowing Machine**



**Input :** Feed: Manual; Fibre flock; From side

**Output :** Opened and moderately cleaned fiber

**Production rate :** 500 Kg/8 Hours

## Working Principle

The Machine consists of 2 sections, one is the Screener and the another one is the Beater. The fibres are fed through the hopper provided on the side of the screener. The screener consists of series of four set of arms attached to the centre shaft. The pith and dust particles will be settled under the screener by the action of gravity and collected in the tray underneath.

The Fibres from the screener are then passed through the beater. The beater consists of a series of Serrated Edged Arms attached to the centre shaft. By the action of Beater, the fibres are opened and the Heavy Trash Particles are thrown away from the mouth of the beater along with the fiber.

The fiber collection zone shall be divided in to three zones one near the mouth, then Middle Zone another zone is far from the mouth. The fibres in the middle zone are collected and they are used as a feed material for slivering machine.

## 2. Step Cleaner



Input : Opened Fibers from Willowing M/c

**Output :** Opened & Well Cleaned Fibers

Production rate : 200Kg/Hr

## Working Principle

Step Cleaner is a high production rate cleaning machine suitable for processing of coir fiber which will effectively clean trash particles such as pith, remnants of husk and foreign materials like sand etc. The machine will have frame structure with reinforcing beams and columns to hold feed hopper, beaters, grid bars & suction unit suitable for processing of coir fiber. The driving assembly comprises of drive motor for driving four set of beaters. Motor is mounted on the side wise of the machine frame which it is connected to second beater by means of pulley. From the second beater the drive is connected to the rest of three beaters by means of belt drive. The beaters are inclined at an angle of 45 degrees. The machine will have grid bars in which the following settings can be adjusted to suit for the processing of coir fibers

- i. Distance of the grid from the beater.
- ii. Width of the gaps between the bars
- iii. Setting angle relative to the beater envelope.

The machine also will have a suction arrangement connected with motor at the side of the machine, the coir trash particles are collected from the top of the beaters by means of three pipes fitted at the top of machine. The pipes are connected to a collector tube and the collected trash are thrown out by the exhaust pipe and collected in to a chamber.



### 3. Autofeeder



Input : Opened Fibres from Willowing or Step Cleaner Machine. (As per Req.)

Output : Fiber in Sheet Form

Production rate : 30 Kg/Hr

#### Working Principle

The opened coir fibres from the willowing machine are fed in to the Autofeeder zone of the Slivering Machine. The coir fibres are taken up by the Inclined Lattice of the Autofeeder and then through the regulator roller. The evener roller will remove the excess material from the spiked lattice pins. The material from the Spiked lattice are then transferred to the coir fiber trunk chute by means of opening roller. The photo sensor will maintain the level of coir fibre in the trunk between minimum and maximum so as to ensure the uniform feeding.

### 4. Slivering Machine



Input : Fibrous sheet from Auto-feeder  
Output : Sliver in Can  
Production rate : 240 Kg/8 Hrs

### **Working Principle**

The coir fibers from the auto feeder will pass through a conveyor belt to a feed roller, then they are opened by the spikes of the Opening Roller. From the Opening Roller they fall on to the inclined lattice. They are then condensed and twisted in to sliver form by the rotating head. The Twisted Sliver is then collected in the Sliver Can.

## **5. Gill Draw Frame Machine**



Input : 4 Slivers from Slivering Machine; Runnage: 20-30 R  
Output : Uniform Sliver  
Production rate : 300 kg/8 Hr @ 25 mtrs /min (Sliver Runnage : 30)

### **Working Principle**

Four coir slivers from the cans delivered from slivering machine are fed through the two set of positively driven rollers which are driven by Individual motor drive. They are fed through a feed roller driven by individual motor. They are then passed through a set of gills pins moved by means of rotating cam roller. The slivers then pass over the moving gills being penetrated in their pins at the centre. After necessary drafting the slivers pass between the drawing rollers. Then they are passed through a pair of delivery rollers and at last collected in Sliver Can which is rotated by means of individual motor drive.

## **6. Single yarn Coir Spinning Machine**



Input : Sliver from Slivering or Gilldraw Frame machine (As per Quality Req)  
Output : Single Coir Yarn  
Production rate : 25-35 kg/8Hr/Spinbox; Runnage: 200-350; Twist: 80-90 Turns/m

### **Working Principle**

Two types of spinning machine developed based on the drive to the sub-elements of the machine

- i. Group Drive Coir Spinning Machine
- ii. Individual Drive Coir Spinning Machine

The Group drive & Individual drive Coir Spinning Machine consists of Five Spinning Heads. They differ only in the drives provided to the sub-assembly. In Group Drive, the drive is provided for Opening Roller, Twister and for Winding Drum Assembly and in Individual drive, individual motor drive is provided for Feed Roller, Opening Roller, & Twister and for Winding Drum Assembly. The Speed of the individual elements of the machine is pre-set as per the required Runnage and Twist.

The Seed yarn will be introduced in to the V-Channel. The Sliver is feed by means of Feed roller and opened by Opening Roller. The Opened fibres will fall on the V-Channel. The rotation of the twister develops centrifugal forces on the seed yarn, and thus the rotation of the seed yarn wraps the fibres collected in the v-channel around the core yarn. Simultaneously the tail end is twisted with each revolution of the twister. This twist propagates towards the tail end of the yarn and binds the fibres into the yarn end. Once the yarn tail enters the SYT, the delivery rollers pull the tail out of the SYT. The degree of twist inserted in the tail will propagate into each length of sheath core assembly in the V-channel, thus forming the next length of yarn.

## **7. Shearing Machine**



Input : Unsheared Single Yarn  
Output : Sheared Single yarn  
Production rate : 75 Kg/8 Hrs

### **Working Principle**

The Single Yarn Bobbin which is to be sheared is mounted on the Spindle which is kept in horizontal axis. The yarn from the spindle is passed through a tensioner and then through a rotating arm which will rotate in clockwise direction. By means of this rotating arm the yarn will be turned and get sheared on both sides. There are two helical cutters rotating in Clockwise Direction. The Helical Cutter rotating in Clockwise direction will shear the protruding fibres



within the limit. The Sheared yarn will then pass through the tensioner and will wind on the bobbin kept at delivery side.

#### 8. Coir Parallel Winding Machine



Input : 2 Single yarn package per Head

Output : 2 parallel Single threads assembled in to a bobbin without twist.

Production rate : 56 kg /8 Hrs/Drum

#### Working Principle

In this process the Single Coir Yarns bobbins from Coir Spinning Machine GD /ID is used as supply packages for Parallel Winding Machine. The Single Coir Yarn bobbins are placed on a spindle Individual yarns from the two packages will then pass through a separate tensioner and then through a Ceramic Guide. Two Yarns are then wound on to the bobbin without twist.

#### 9. Two for One Twister (TFO)



Input : Assembly package from Parallel winding machine

Output : Bobbin Package of Two ply yarn.

Production rate : 50 – 100 kg/8 Hrs/ Spindle

#### Working Principle

An assembly wound package (i.e. two yarns assembled onto one package without any twist) from Parallel Winding Machine is used as the stationary supply package. The supply yarn is passed through a freely rotating flyer and then passes through the hollow rotating spindle. At the base of

the spindle, the yarn comes out forming a balloon, and then goes onto the winding head via the yarn guide and Tensioner. Each rotation of the spindle will insert one turn of twist in the length of yarn within the spindle, plus another turn of twist in the yarn balloon. As a result, two turns of twist are inserted into the yarn for each rotation of the spindle.

#### 10. Spooling Machine



Input : Single or 2-ply yarn Bobbin  
Output : Large Yarn Spool of 5-10Kg.  
Production rate : 300 Kg/8 Hrs

#### Working Principle

The yarn from the bobbin is placed on the spindle, from there the yarn is passed through a tensioner and then through a yarn guide and traverse rod. The yarn will wind on the rod, by means of traverse mechanism. The bigger bobbin will build up in the rod by means of frictional drive by the rotation of the Spooling Drum of Dia 14". The final package is collected by means of lifting the dead weight cradle.

#### Report of Technical Review Committee on the trial run of the plant machinery at Dr. MGR University, Chennai

As per the order of Hon. Chairman, Coir Board, Dr. MGR University has conducted trial run of the machinery on 14.08.2020 through VC and technical committee members has evaluated the performance of the machine and the major observations of the technical committee are following.

- It is a new era in coir spinning system and appreciates the efforts of all the team members for their contribution
- Development of preparatory machine to spooling machine was good

- The machine is performing well with 25 Mtrs/min, so that with small fine turning of the machine, it may be able to perform well under further higher speed
- Technical committee advised to maintain the correct RH and Temperature for good performance of the machine
- Yarn appearance is better compared with the earlier one produced
- Layout of the coir spinning mill setup is good
- The machine performance was not up to the level in the first session of trial run and it was satisfactory and improved by increase in humidity in the second session.
- The machine performed well in slow and high speed in second session.
- The number of yarn breakage was more in the first session and it was very less in the second session and hence technical committee advised to consider the factors influencing yarn breakages.
- Insisted to satisfy the requirements of industries and suggest to focus more on quality of yarn such as uniformity and less hairiness of yarn as per MoU
- The machines has to be fine-tuned in all aspects of yarn quality as per MoU and the same has to be inspected physically at Dr.MGR University before shifting to CCRI, Kalavoor

#### **Next planning schedule for conclusion of the project**

Fine Turning of Machines to be completed by December 2020 First Week

Conduction of TRC Meeting & SRC Meeting by December 2020 Second Week

Erection and commission of the demo plant at CCRI by January 2021 Third Week

Three Months Training at CCRI from February 2021-April 2021.

#### **Action taken by CCRI for the installation of plant machinery at Coir Board Complex, Kalavoor**

It may please be noted that after successful trail run and operation of the plant machinery at Dr. MGR University, in order to introduce the technology in the trade, it was decided to shift the plant concept machinery in to Coir Board Complex, Kalavoor and install the same in Hindustan Coir Factory. The board in its 233<sup>rd</sup> meeting held on 03.07.2020 has approved the proposal “Engagement of project hands for the operation and trial run of 10 head spinning machine developed by Dr. MGR University, Chennai as part of collaborative project with Coir Board” and sanctioned an amount Rs.20 lakh to conduct continuous operation and trial run of the machine by engaging the project hands/ apprentice at CCRI for a period of 3 months through NCT&DC placement cell. Also it was approved that the coir yarns produced from the machine



may be utilized for the routine R&D works of CCRI and training purposes of NCT&DC and also for the production of different coir products in Coir Technology Incubation Center at CCRI. Further, it may be noted that necessary action has already been taken by CCRI to install the machinery at Hindustan Coir Factory and dimensions and electrical layouts of the factory has already been shared with university project team for the installation of machinery at the factory.