

# PRODUCT DEVELOPMENT AND DIVERSIFICATION

YEAR	ACTIVITIES	ACHIEVEMENTS
<b>1961-62</b>	<p>The use of coir mattings for sand stowing purposes in coal mines was investigated in collaboration with the Collieries of Tata Iron &amp; Steel works. The results of the preliminary experiments were encouraging and extensive trials proposed to study the economics of the process.</p> <p>Coir beltings were sent to the Iron mines of Tata Iron and Steel Company for experimental use as conveyors for fine ores.</p>	<p>1. Investigated the use of coir matting in sand stowing purposes in coal mines and coir belts as conveyors for fine ores in iron mines.</p>
<b>1962-63</b>	<p>Experiments carried out in collaboration with TISCO Collieries and M/s Andrew Yule &amp; Co. indicated that Coir matting could be reused for sand stowing operations for about 40 times. TISCO reported that the experimental investigations on the use of coir belting as conveyors of "Fines" in Iron Mines did not suit their purpose.</p> <p>The possibility of utilising retted fibre, mattress fibre and decorticated fibre with cotton waste, in axle box packing was under investigation at the Railway Research Centre, Lucknow.</p> <p>Sample mats were supplied to Defence Research Laboratory for studying its use as dumping mats as shock absorbing percussion heads.</p> <p>3 cwts of coir pith and coir waste was dispatched to a firm in U.K for conducting studies on the use of coir waste and coir pith in the preparation of thermosetting plastics.</p>	
<b>1963-64</b>	<p>Admixed coir fibre and ramban fibre in the proportions of 75:25, 50:50 and 25:75 and spun into yarn and the result indicated that the proportion of the fibres in the spun yarn varies from original composition of the fibre and the admixture of coir with ramban fibres prior to spinning does not yield any special advantage.</p> <p>Preliminary experiments indicated that it is possible to prepare furfural and absorbent carbon from coconut pith.</p>	<p>1. Admixed coir fibre and ramban in different proportion for spinning blended yarn.</p>

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<b>1964-65</b>	<p>The cost of stencilling of matting per sq.meter with the enamel paints was Rs.0.65/- in comparison to Rs 1.08/-for emulsion paint and Rs.0.43 for dyes respectively.</p> <p>Application of adhesives to the back of creel mats by brush observed to give better result thereby eliminating the binding and other finishing processes.</p> <p>Insulation boards from coconut pith were fabricated from a number of compositions and its thermal conductivity and bulk density were assessed.</p> <p>Investigations proved that bulky absorbent charcoal was resulted on low (500<sup>0</sup> C -600<sup>0</sup>C) and high (900<sup>0</sup> C -1000<sup>0</sup> C) temperature carbonisation of coconut pith.</p>	<p>1. Assessed the thermal conductivity and bulk density of insulation boards evolved from coconut pith.</p>
<b>1965-66</b>	<p>Attempts were made to develop non-skid backing surfaces to mats and mattings using fish glue, formaldehyde, rubber latex.</p> <p>A few materials like tar oils, mineral oils, cashewnut shell liquid, etc. were applied on coir for improving the resistance of coir against deterioration when exposed to weathering.</p> <p>Sample pith boards were made using latex as the binding material and it was observed that ratio of pith to latex cannot be reduced beyond 50:50 without adversely affecting the quality of the product.</p> <p>A few selected samples of coir materials were tested for sound absorption qualities for examining the possibility of using of coir for purposes of acoustic control.</p> <p>Possibilities of spinning hemp fibre on the coir-spinning machine indicated that though a two-ply yarn could be spun on the machine with the fibre strands cut to the length of about 9 inch to 12 inch, the machine is not suitable for producing yarn of single ply.</p> <p>Spinning experiments were conducted to obtain a two-ply yarn from blends containing coir and banana to obtain yarn of fancy effects. Banana fibres cut into lengths of about 9 inches to 12inches and suitably opened up could be spun on the country ratt.</p>	<p>1. Yarns were spun from blends of coir / banana</p>

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<b>1967-68</b>	<p>The thermal conductivity of a few selected types of coir materials were determined to explore the possibilities of utilising coir for thermal insulation and compared with the competing materials like thermocol. The study revealed that use of coir should find favour for use as thermal insulator over the low temperature for cold storage, refrigeration and general-purpose building insulation on a commercial scale.</p> <p>Prepared board from coconut pith by mixing urea formaldehyde adhesive and coconut pith in the proportion of 1:4 and processing the mix further in moulds between platens of a screw press at room temperature.</p> <p>Efforts were made for taking up investigation on utilisation of coir waste and cocunut pith in collaboration with Dept. of Chemical Technology, University of Bombay.</p>	<ol style="list-style-type: none"> <li>1.Determined thermal and acoustic properties of coir.</li> <li>2.Prepared boards from coconut pith.</li> </ol>
<b>1968-69</b>	<p>Kayarool fancy druggets were prepared on the handloom with coir yarn as the warp strands. The material was observed to have a novel appearance, but the drugget was found to be somewhat harsh and stiff, which could be made more flexible with jute yarn as the warp material.</p> <p>Samples of coir pads with latex adhesive were tried as a heat insulant for storage and transport of frozen fish by the Institute of Fisheries Technology but its use was limited [eventhough bulk density was satisfactory] due to the high value for thermal conductivity, hygroscopicity and odour of the binding composition. Thin rubberised pad with minimum quantity of latex to bond the fibres was made and its thermal conductivity measured at 0.00005749-cal/cm<sup>2</sup>/sec/0<sup>0</sup>c/cm thicknesses and explored the possibilities of using as a heat insulator.</p> <p>Use of coir matting for sand stowing in coal mines was investigated in collabaration with the Mining Research Station, Dhanbad. On comparison with the strength to rupture of the different barricading materials, it was observed that coir matting was 3.2 times stronger than brattice cloth, 3.6 times stronger than double layer hessian cloth, 5 times stronger than single layer hessian cloth and 8 times stronger than bamboo mattings and strength to rupture of coir matting was least affected by water.</p>	<ol style="list-style-type: none"> <li>1.Evolved printing of coir using plastic emulsion and synthetic enamel paints.</li> <li>2.Evolved kayarool fancy druggets.</li> </ol>

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<b>1969-70</b>	<p>Field test in a colliery revealed that coir mattings had definite advantages over the conventional barricading materials for stowing operations.</p> <p>Samples of coir matting bonded with plywood veneer when tested for sound absorption coefficient gave very low acoustic quality. It was observed that the sound absorption coefficient of coir products (Needled coir pad and rubberized coir pads) bonded with hard board material was of a very satisfactory order.</p> <p>Rubberised coir pads were used as a general purpose thermal insulants over the low temperature range but was not used on an industrial scale due to the combustible nature of coir.</p>	
<b>1970-71</b>	<p>The field tests by Central Mining Research Station, Dhanbad on use of coir mattings as barricading material for sand stowing operation in mines revealed an overall saving of 64% in the cost of the barricading material in relation to bamboo mats.</p> <p>Preliminary work under a collaborative research project with the Central Road Research Institute on utilisation of coir mattings/ pads in road construction and erosion control on hill slides in the following areas were taken.</p> <ul style="list-style-type: none"> <li>▪ as an underlay for asphaltic concrete.</li> <li>▪ as an underlay for sand asphalt surfacing.</li> <li>▪ as an reinforcing layer for flexible overlays on cracked cement concrete slabs and.</li> <li>▪ as a layer to prevent reflection created flexible pavements from shrinkage of soil cement bases.</li> </ul>	<p>1.Field tests were conducted on application of coir matting as barri-cading material for sand stowing.</p>