



K.K. Sasidharan

# Nano technology helps making superior products

Nano composite-modified rubberised coir mattresses and football bladders have superior qualities and a host of advantages compared to the ordinary ones

**N**ano technology is expected to have an impact on nearly every industry. Applications of nano technology are in the form of nano materials.

The raw materials used in the production of rubberised coir mattresses are natural rubber latex (60% centrifuged - high ammonia), coir (hard coir fibre is a lingo - cellulosic natural vegetable fibre derived from the husk of the fruit of *cocos nucifera*) and various rubber chemicals. Rubber chemicals include nano composites, accelerators (zinc mercapto benzothiazole and zinc diethyldithio carbamate), vulcanising agents and activator (sulphur and zinc oxide) and mineral fillers for reducing the compound cost. It is essential to include an efficient antioxidant also in the compound.

## Manufacturing process

The highly twisted ropes are uncurled and fed into the sheet machine. Latex, compounded

with nano composites, is sprayed on it to provide a proper binding to the millions of tiny coir springs. The sheets are pressed for the required thickness and density, and then subjected to the vulcanisation process. Rubberised coir mattresses are made in different sizes and thicknesses, and finished with different types of covers as required for elegance and comfort.

The writer works with TC Division of Rubber Research Institute of India (RRII), Kottayam, Kerala



Rubberised coir blocks



Finished mattress

It is observed that nano composites along with natural rubber latex compound impart superior modulus, low compression set, and best ageing resistance compared with normal rubberised coir mattresses. Nano composite-modified rubberised coir mattresses, have the added advantage with regard to providing extraordinary orthopedic support without sagging. The nano composite rubberised coir mattresses provide excellent spring support to body and help preventing backache. Various quality control test methods for rubberised coir mattresses

CONTINUED ON PAGE 49

sector, RIMCORP is known for its expertise in the setting up of rubber processing and rubber products manufacturing factories and effluent treatment plants.

Apart from the management of solid and liquid wastes, RIMCORP's capability in the measurement and management of odour from rubber processing factories has been well known. RIMCORP has also carried out contract research for the Malaysian National Sewerage Company, the Indah Water Konsortium (IWK) and the National Petroleum Company (PETRONAS).

According to Dr. Yusof Aziz, CEO, RIMCORP's vision is to become the organisation of choice for the Malaysian rubber industry to facilitate the exploitation of the K-economy in all rubber and related activities. "This means commercial deployment of MRB's Intellectual Property Rights in the form of new technologies, professional expertise, up-to-date facilities and support services for the mutual benefit of Malaysian rubber industry and the MRB", he added.

### Rubber supply

On the supply side of raw rubber, RIMCORP is the exclusive processor and supplier of speciality grade rubbers like deproteinised natural rubber (DPNR), Ekoprena 25 and Ekoprena 50

(a form of epoxidised natural rubber). Apart from this, the corporation is also the producer and supplier of the popular "SUMAR" brand of odourless rubber.

In the downstream sector, RIMCORP's most recent involvement is the development and supply of rubber buffers to the Kuala Lumpur Monorail coaches. The agency also provides analytical testing services for dry rubber, latex, rubber products such as gloves, tyres, shoes and automotive components.

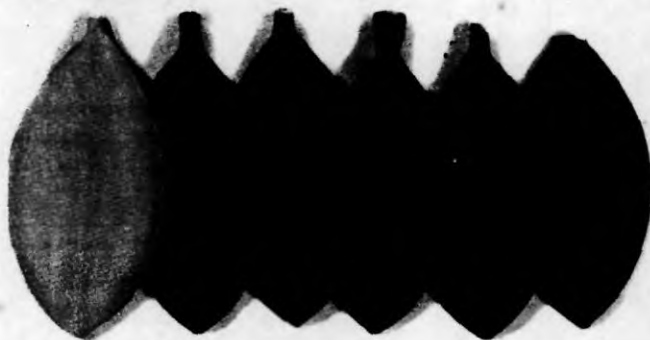
### Global clientele

RIMCORP's global and domestic clientele comprise major names like Sumitomo Rubber Industries, Japan, FIT Biotech, Finland, LOFARMA, Italy, ALLERGOPHARMA, Germany, AMC Management, Vietnam, Federal Land Development Authority (FELDA), Rubber Industry Smallholders Development Authority (RISDA), GIMFLOW Sdn. Bhd., Hateg Corporation Sdn Bhd, Chemigro Sdn. Bhd, Indah Water Konsortium, Scomi Rail Sdn Bhd. and Fox Gloves Solutions Sdn Bhd.

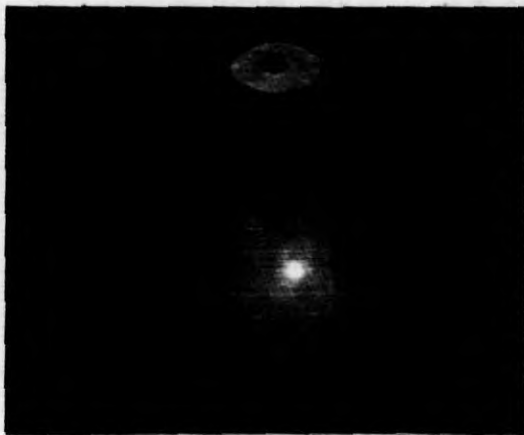
It goes to the credit of RIMCORP that it has successfully carried out a variety of consultancy work in countries like Cambodia, Ghana, Guatemala, Guinea, India, Indonesia, Liberia, Nigeria, Philippines and Vietnam. ■

CONTINUED FROM PAGE 47

## Nano technology helps making superior products



Nano modified foot ball bladders before fixing valves



Finished foot ball bladder

are described in the Bureau of Indian Standard specification BIS: 8391.

### Foot ball bladder vulcanisates

60% centrifuged natural rubber latex (high ammonia type), compounded with a proper choice of rubber chemicals, nano clays, and surfactants, improves the barrier properties, modulus and tensile properties of foot ball bladder vulcanisates. By the incorporation of nano composites, the foot ball bladder will have lower air permeability and superior modulus than normal dipped foot ball bladder vulcanisates.

Proper choice of surfactants helps to incorporate nano materials and this makes it possible to prepare high quality foot ball bladders with outstanding barrier properties and excellent modulus.

Rapra Technology Limited, on behalf of British Rubber Manufacturers Association, has published a book titled: *Toxicity and safe handling of rubber chemicals*. Based on it, the rubber industry uses a wide variety of chemicals. According to the book, great majority of rubber chemicals and raw materials do not constitute any significant health hazard. On the other hand, it should be clearly understood that almost any chemical can be hazardous if subjected to careless use or abuse. ■