

## USE OF RADIATION VULCANIZED NATURAL RUBBER LATEX (RVNRL) IN SMALL AND MEDIUM SCALE INDUSTRIES IN SRI LANKA

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The Rubber Industry in Sri Lanka is served mainly by three Institutions viz the Rubber Research Institute (RRI), Ceylon Institute for Scientific and Industrial Research (CISIR) and the Industrial Development Board (IDB). The main function of RRI, Sri Lanka and the CISIR is Research and Development, and the IDB is more concerned with small and medium scale industries and down stream development activities. Apart from these three institutions, the Export Development Board (EDB) plays a major role in the export marketing and market promotion of rubber products. Other organisations such as the Greater Colombo Economic Commission (GCEC) support mainly large scale and sometimes medium scale industries.

RRI also plays a key role in servicing the plantation sector. This is RRI's primary function. RRI has also organised to service the rubber products industry in a big way. It is the intention of the RRI to set up a modern Research and Development Laboratory to serve the polymer industry in the near future. This laboratory will be centrally located in the outskirts of Colombo, the capital city of Sri Lanka.

The second phase of the development of this laboratory will include the installation of an electron beam machine mainly to develop RVRNRL for industrial use:-

The consumption of Natural Rubber in Sri Lanka for rubber products manufacture is given in Table 1. While the total consumption for the year 1988 stood at approximately 20,000 t the consumption of centrifuged latex was 7620 t (dry). The figures show a steady increase in the consumption of centrifuged latex. The increase was 18% from the previous year (1987).

Distribution of small and medium scale latex based industries in Sri Lanka is given in Table 11. Rubberised coir which is a cushioning material made from two natural products widely available in Sri Lanka, namely Rubber and coconut fibre, is manufactured in small and medium scale industries and it is one of the most popular products manufactured by small industrialists. Of the 73 units that are registered 45 units produce rubberised coir cushions. It will be an asset to such industries if prevulcanized latex is supplied that could be used directly for the manufacture of rubberised coir. RVNRL has vast potential for the development of such industries.

Centrifuged latex is supplied to the industry by two main sources the Janatha Estate Development Board (JEDB) and the Sri Lanka Rubber Manufacturing Company (SRMC). JEDB controls about one half of the state owned rubber plantations and they normally do not depend on other sources for field latex for the purpose of centrifuging. SRMC was set up mainly to assist the small holders and this organisation depends mainly on small holders latex for the production of centrifuged latex. Field latex from small holders generally have a low Dry Rubber Content (DRC). This tends to reduce the efficiency of centrifuging. SRMC has proved that small holders latex can be a useful source for the manufacture of centrifuged latex provided the necessary precautions are taken in the handling of latex especially in the initial stages of collection. Incentives are given by the Government for the manufacture of centrifuged latex. These incentives are in the form of 1/3rd subsidy on new equipment and for the processing of skim rubber which is a by-product of centrifuged latex manufacture. Laboratory equipment, if installed for the analysis of centrifuged latex, is also entitled to a subsidy. It is the policy of the Government of Sri Lanka to give maximum support to the growth of the rubber products industry. Incentives include equity participation and special financial assistance, Income Tax reliefs, a transferable tax credit scheme and assistance in product development and market development. Other advantages in setting up rubber based industries in Sri Lanka is the availability of Natural Rubber (NR) and NR latex as indigenous raw material at a substantially lower price than the world market price of NR. Labour is cheap in Sri Lanka and the wages are relatively low compared to the wages in other countries in the South East Asian region. It's geographical location which is central to both East and West and its port facilities are other attributes for setting up an industry in Sri Lanka. Sri Lanka enjoys preferential tariff to most developed countries with respect to the sale of certain rubber products.

There is great potential for the use of RVNRL in cottage scale industries. The Government's poverty alleviation programme referred to as JANASAVIYA will be set in motion to assist poor families in income generating ventures. After a careful screening process the recipients of government assistance under this programme will be helped and trained by Institutions such as the RRI, CISIR and the IDB, to start up rubber based industries. Market for these rubber products will be identified mainly in the periphery of the location of the industry. For an initial period of two years the Government assistance will be a payment of Rs. 2,500 per month to each recipient family. Of this amount Rs. 1,400 will be deposited in a savings account and the balance Rs. 1,100 will entitle the recipient to purchase food stuffs, agricultural inputs such as seed paddy, agricultural utensils such as mammotie, stationery and school books and similar items which are considered essential for a living. At the end of two years each recipient family will have a bank balance of Rs. 25,000. Under the training scheme, training and selection will take place depending on the aptitudes of the people. After two years a small business venture can be started utilising the money saved by each family. Several families or individuals can get together to start an industry depending on the requirement of capital to start such an industry. The infra structure will be developed to ensure that proper marketing channels are established. Under the RRI adaptive research programme several adaptive research centres will be established in the rubber growing areas and these centres will be manned by technically qualified personnel who will be available to give assistance to set up rubber based industries. RVNRL is a good material for the manufacture of dipped rubber goods such as rubber bands, rubber gloves, rubber balloons and rubber valves, on a cottage

scale. As vulcanization is already accomplished by radiation the only major operation after dipping is drying, using solar energy. The process is very simple and the RVNRL prepared at a central location can be distributed through the adaptive research centres or similar centres established by other organizations (Table III).

Several other products can be developed using RVNRL<sup>1</sup> making use of attributes of RVNRL such as clarity, purity, ability to accept fillers and pigment. Pigment acceptance is found to be exceptionally good with the production of coloured products with a good finish and appearance.

Economies of scale are important in the production of items such as examination gloves. There is a big demand for good quality examination gloves. High through part and efficient production with less than 5% of rejects are the main features of a good production line which takes care of all the steps in the production process with precise control of temperature and viscosity of the latex ensuring correct pick up on the surface of a clean former. Cleanlines of the former is ensured in the production line with a built in cleaning operation. It is also important to feed into the system latex of consistent quality. Prevulcanized latex such as RVNRL containing very little powders as additives would behave better with less problems from agglomerated particles if powders are not dispersed in the latex. RVNRL will have the edge over conventional sulphur vulcanized latex in this respect.

A medium scale industry to produce quality dipped products using a well engineered production lines would be advised to use RVNRL as an alternative to sulphur prevulcanized latex to achieve a higher and more efficient through put.

#### REFERENCES

H Narangoda, "Applications of radiation vulcanized latex" A paper presented at a seminar on Radiation vulcanization Technology held in Colombo in October 1988.

Table 1. *Consumption of NR in Sri Lanka for Rubber Products Manufacture (t)*

| Year | Dry Rubber | Conc. Latex (dry) | Total  |
|------|------------|-------------------|--------|
| 1980 | 13,499     | 1,427             | 14,926 |
| 1981 | 14,765     | 1,451             | 16,216 |
| 1982 | 14,420     | 1,949             | 16,369 |
| 1983 | 14,630     | 1,819             | 16,449 |
| 1984 | 11,991     | 3,070             | 15,061 |
| 1985 | 9,429      | 5,840             | 15,089 |
| 1986 | 10,909     | 5,474             | 16,383 |
| 1987 | 12,100     | 5,650             | 17,750 |
| 1988 | 13,450     | 6,720             | 20,170 |

Table 2. *Distribution of small and Medium Scale Latex based Industries in Sri Lanka*

| Product                        | No. of units |
|--------------------------------|--------------|
| Rubberised coir                | 45           |
| Latex dipped products          | 17           |
| Cast products                  | 05           |
| Foam                           | 02           |
| Spreading and surface coatings | 04           |

Table 3. *Scheme of distribution of RVNRL for the Janasaviya*