

USE OF RUBBER SEED OIL IN POLYCHLOROPRENE RUBBER COMPOUNDS

Reethamma Joseph, Rosamma Alex, C.K. Premalatha and Baby Kuriakose

Joseph, R., Alex, R., Premalatha, C.K. and Kuriakose, B. (2002). Use of rubber seed oil in polychloroprene rubber compounds. *Indian Journal of Natural Rubber Research*, 15(2) : 143-149.

Rubber seed oil has been evaluated as an acid acceptor and plasticizer in gum and carbon black filled polychloroprene compounds replacing magnesium oxide and naphthenic type process oil. The results of the study indicate that use of rubber seed oil helps to achieve better scorch safety, faster cure rate and better ageing resistance in polychloroprene compounds. It can replace magnesium oxide and process oil in carbon black filled polychloroprene compounds. Use of rubber seed oil gives comparable tensile and tear strength and better abrasion resistance for the carbon black filled polychloroprene vulcanisates. Vulcanisates containing rubber seed oil do not develop fungus on their surface.

Key words: Ageing resistance, Epoxidised rubber seed oil, Fungal growth, Plasticizer, Polychloroprene rubber, Rubber seed oil.

Reethamma Joseph, Rosamma Alex, C.K.Premalatha and Baby Kuriakose (for correspondence), Rubber Research Institute of India, Kottayam 686009, Kerala, India (E-mail: rrii@vsnl.com).

INTRODUCTION

In India, natural rubber is grown mainly in the southern states with Kerala having the largest area. Rubber seed is an important byproduct from the rubber tree. The oil extracted from the seed has many industrial uses. The estimated production potential of rubber seed in India is about 150 kg per ha (Haridasan, 1977). Rubber seed contains oil and a high protein residue (Dayaratne, 1973). The production of rubber seed oil (RSO) in India in 1999-00 was 1600 MT. The oil content in the dried kernel is about 42%. The oil contains 18 to 22% saturated fatty acids and 78-82% unsaturated fatty acids. The properties of oil and the composition of fatty acids present in RSO as reported earlier (Bhushan, 1958) are given in Tables 1 and 2 respectively.

As RSO satisfies certain standard requirements in the manufacture of alkyd resin, soap and paints, it finds application in these industries. RSO can be used as a substitute for linseed oil in the manufacture of paints. RSO / alkyd resin paints are ideally suited for many surface coatings

(Dayaratne, 1973; Obioma and Ikpendu, 1995). Even though RSO can be chemically modified to produce epoxidised rubber seed oil (ERSO) (Vijayagopalan and Gopalakrishnan, 1971) and factice (Vijayagopalan, 1971) in India the current industrial use of rubber seed oil is confined to soap manufacture. Use of limited quantities of vegetable oils such as linseed oil is reported to give better ozone resistance for polychloroprene rubber vulcanisates (Murray, 1959). Use of coconut oil in NR compounds as plasticiser for footwear application is also reported (Parab, 1976). Since RSO contains a large proportion of unsaturated fatty acids (Table 2), an attempt is made

Table 1. Properties of rubber seed oil

Parameter	Range of values
Acid value	4 - 40
Saponification value	190 - 195
Iodine value	132 - 141
Hydroxyl value	12 - 32
Unsaponifiables (%)	0.5 - 1
Refractive index (40°C)	1.466 - 1.469
Specific gravity	0.92 - 0.93
Titre°C	28 - 32