

**DEVELOPMENT OF NATURAL RUBBER (NR) AND
ETHYLENE-PROPYLENE-DIENE-MONOMER
(EPDM) RUBBER BLEND FOR TIE DOWN STRAP
COMPOUND**

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Addition

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ABSTRACT

The tie down strap is mainly used to hold tarpaulins securely in heavy duty vehicles by providing high tensile strength and constant tension during transportation. Tie down strap is made out of pure natural rubber (NR) or pure ethylene-propylene-diene monomer (EPDM) rubber depending on the climate they are being used. NR tie down straps have high tensile strength but easily crack and split due to deterioration of NR in warmer climates. EPDM rubber tie down straps are designed for warmer climates but, it has low tensile strength. Therefore, development of a tie down strap by blending NR and EPDM together to obtain both desired properties of NR and EPDM rubber is worthwhile. This research study was conducted to develop a suitable tie down strap compound having the best NR/EPDM blend ratio. Then the effect of a compatibilizer on NR/EPDM blends was also tested. Nine different blend ratios (N90:E10, N80:E20...N10:E90) were prepared by mechanical blending and they were tested for cure characteristics and physical properties (tensile strength, elongation at break, tear strength, tension set and hardness) with respect to the product specifications (Samson rubber products, 2012) of tie down strap. The same series of blends were further evaluated by adding a compatibilizer (methacrylate-butadiene-styrene or MBS) and similar properties were measured. The results revealed that, NR: EPDM blend ratios of 90:10, 50:50, 30:70 and 10:90 have achieved acceptable cure characteristics according to the given product specifications. When physical properties were concerned, only N90:E10 blend has achieved almost all the physical properties of the product specification except tension. Cure characteristics and physical properties have not significantly changed after adding the compatibilizer. Therefore, it can be concluded that NR/EPDM blend ratio of 90:10 is more suitable for tie down strap compounding and the added compatibilizer has not significantly affected on cure characteristics and physical property improvement of NR/EPDM blends.

Key words: Tie down Strap, NR/EPDM Blend, Compatibilizer, Cure characteristics, Physical properties