

UNIVERSITI TEKNOLOGI MARA

**HOT TEAR RESISTANCE OF
VULCANIZED RUBBER**

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

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AURTHOR'S DECLARATION

I declare the work on this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I hereby acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.


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ABSTRACT

Molding is a process to fabricate the compounded rubber to the desired shape and dimensions of the intended product. Rejects attributed to poor hot tear resistance of vulcanized rubber at high temperature vulcanization are of prime concern, in particular thin and complicated moulded rubber profiles. The purpose of this study is to investigate the effect of high temperature on tearing energy of vulcanized rubber, the effect of types of filler on tearing energy and the effect of types of crosslink on hot tear resistance. Tearing measurements were done at various different temperatures practiced by the rubber industry. Trouser test-pieces were placed inside an electrically heated oven at the desired test temperature for 15 minutes before applying dead load to determine its critical tearing energy. It was found that strain-crystallizing rubbers showed critical tearing energy, T_c . Above T_c catastrophic tearing occurs. Non-strain-crystallizing rubber shows time dependent tearing where the crack increases in length as a function of time. The magnitude of tearing energy is affected by the extent of strain-crystallization. In the absence of strain-crystallization, the tearing energy is affected by the glass-transition temperature, T_g . The higher the T_g , the higher is the tearing energy.

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