

## RD17001 – Laboratory Study of DFT & Fabric Composites for DIN EN549 in Flat Sheet Mouldings

### Project Overview

Diaphragms manufactured for EN549 are traditionally fabrics spread with NBR & ECO rubber. Project: RD17001 was opened to determine if combining DFT and fabric at various loadings could provide a technical and commercial advantage versus current EN549 qualified variants.

The scope also allows a material database to be created to understand the limits of burst pressure v thickness and be used as a future sales tool during the quotation stage.

### Scope of Work Conducted

Total of 86 Samples manufactured in a two-shot compression moulding process -consisting of:

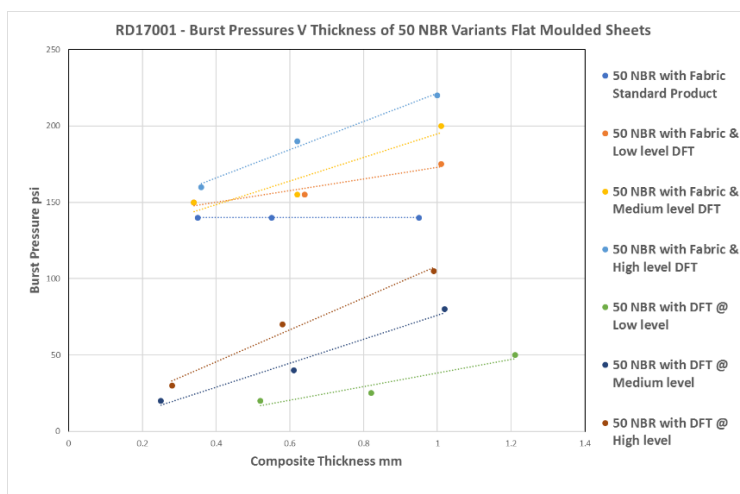
- Rubber – 50 IRHD NBR & 72 IRHD NBR
- Rubber – 55 IRHD ECO & 60 IRHD ECO
- Fabric – Polyester
- DFT – Various loadings Low, Medium & High

All samples then tested for burst pressure, evaluated against thickness.

Evaluated as thickness v burst and costed as a typical 0.8mm thickness current diaphragm



### Results 50 NBR



### Observations

50 NBR burst pressure with fabric shows no increase with rubber thickness

Increasing load of DFT increases burst pressure in a linear trend

Data can be used as an accurate prediction method of thickness v burst pressure

Tel: +44 1254 884171  
Fax: +44 1254 887753  
Sales Fax: +44 1254 888010  
[www.metflex.co.uk](http://www.metflex.co.uk)

Freudenberg Sealing Technologies UK Ltd.  
20 Alan Ramsbottom Way, Great Harwood,  
Blackburn, Lancashire, England  
BB6 7FE

## Results 72 NBR

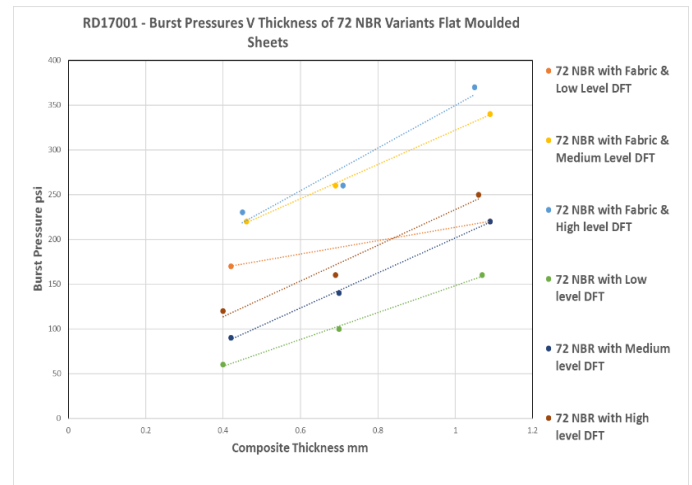
### Observations

72 NBR crosses over @ 0.8mm thickness

**A lower cost DFT version could be used to replace DFT & Fabric**

Repeats a linear progression be used as an accurate prediction method of thickness v burst pressure

The burst pressure v hardness v thickness trend was replicated in ECO compound tests



### Immediate Benefits

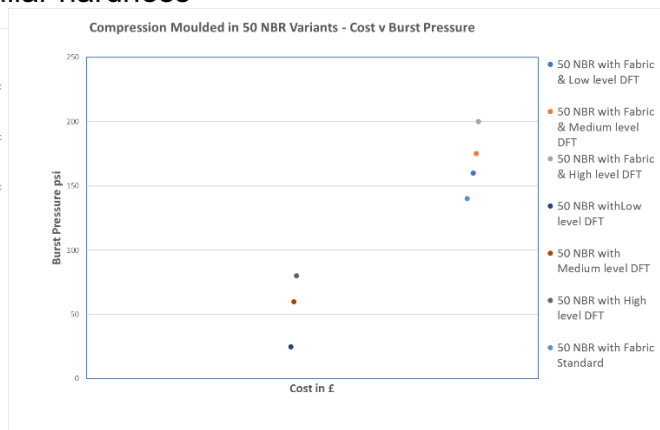
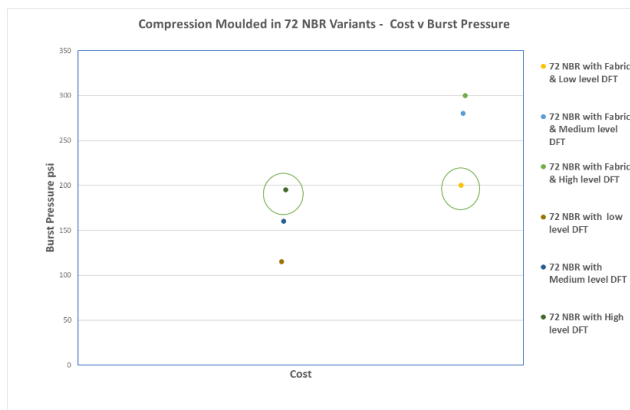
Cost exercise completed as a 0.8mm thick existing diaphragm supplied by Metflex

**At 200 psi a High level DFT diaphragm replaces a low level DFT & Fabric in 72 NBR**

**The cost is significantly reduced, possibly by up to 50%.**

The cost saving is similar on 50 NBR but burst pressure slightly lower.

This trend continues for ECO variants of similar hardness



### Conclusions & Possible Further Work

**From a commercial perspective it could be that some coated fabrics are over engineered for the burst pressure they are used at? Use DFT to give a commercial advantage?**

**Material Database burst graphs can now be used as a sales tool – Channelling enquiries**

**Further work may be required to ascertain performance such as flexibility and processing**

### Contact Us

Our dedicated and highly knowledgeable staff are always on hand to provide process support from initial concept through qualification and delivery. For further details or if you have a current or future project please contact our Materials Development team on the details below.

[Andrew.Gwinnett@fst.com](mailto:Andrew.Gwinnett@fst.com) – Materials Development Technologist & [Steven.Parry@fst.com](mailto:Steven.Parry@fst.com) – Head of Materials