

# RB225-Roxul® 1000

## for improved performance of rubber bonded friction materials



### INTRODUCTION

Roxul®1000 fibres are widely used as a reinforcement product for friction materials. In all kinds of non-asbestos applications they are an important component of new generations of formulations.

Roxul®1000 fibres primarily offer high temperature reinforcement to friction materials. Silanes can be applied to fibres in order to further improve the reinforcement properties in composite applications. Silanes can create a more reactive interface at the fibre surface towards binders resulting in improved mechanical properties of composites like friction materials.

For rubber bonded friction materials the RB225-Roxul®1000 has been developed, a sulphur silane coated fibre.

### WHAT IS RB225-ROXUL®1000?

RB225-Roxul®1000 is a medium length, highly cleaned bio-soluble mineral fibre. The low shot content contributes to the positive effect of the fibre on both pad and rotor wear. Furthermore the fibre has a sulphur silane coating. The sulphur silane coating has a highly reactive surface which crosslinks with all rubbers in the matrix. This ensures an optimal adhesion of the rubber to the fibre surface resulting in a maximum contribution of the fibres to the mechanical properties of the friction material. The improved bonding can be observed on electron microscope pictures of non-coated and sulphure silane coated fibres in a rubber based matrix:

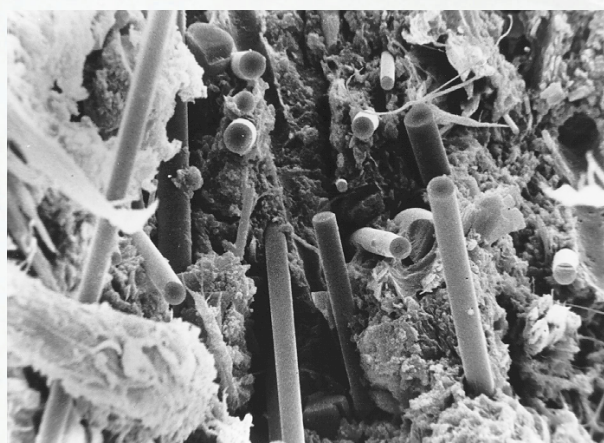


Figure 1. Untreated fibres display a poor attachment to the rubber and are easily detached from the matrix.

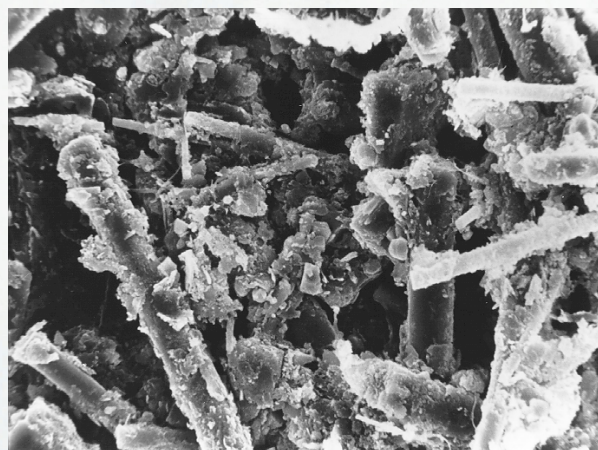


Figure 2. The RB225-Roxul®1000 shows an excellent attachment to the rubber matrix.

RB225-Roxul®1000 product specifications:

- Length: 300 ± 50 µm
- Diameter (typical): 5,5 µm
- Hardness (typical): 6 Moh
- Shot: max. 1,0 wt% >125 µm
- Melting temperature: >1000 °C
- Surface treatment: sulphur silane
- Bio-soluble

### RESEARCH SET-UP

In this research the sulphur silane coated RB225-Roxul®1000 has been compared to a non-coated base fibre with exactly the same dimensions.

The research has been performed in a friction paper formulation. This formulation contains 20 wt% mineral fibres. Table 1 shows the evaluated formulations:

	Non-coated fibre [wt%]	Sulphur silane coated fibre [wt%]
NBR	5,5	5,5
<b>Non-coated base fibre</b>	<b>20</b>	-
<b>RB225-Roxul® 1000</b>	-	<b>20</b>
Organic fibres	5	5
Powder fillers	57,0	57,0
Platy fillers	12	12
Vulcanization paste	0,5	0,5

Table 1. Friction paper formulations.

Both evaluated formulations were produced using a paper process. The first step was making a homogeneous pulp of the raw materials in a high intensity pulper. Subsequently both pulps were dewatered over a sieve. The wet sheets were then compressed and dried in order to achieve the desired density. As a last step the materials were cured in an oven at 110°C in order to crosslink the rubber.

## RESULTS

The tensile strength was measured according DIN 52910. The results can be found in table 2.

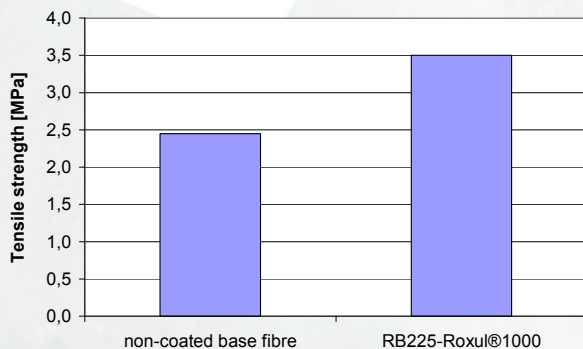


Table 2. Tensile strength results.

The table shows an increase in tensile strength of approximately 40% by usage of the sulphure silane coated RB225-Roxul®1000 in comparison to a non-coated fibre.

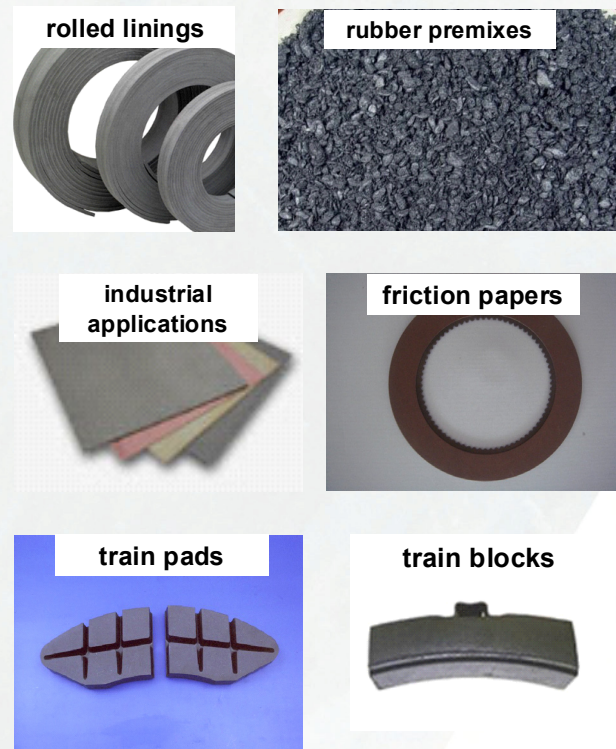
## CONCLUSIONS

In rubber based friction materials the sulphure silane coated RB225-Roxul®1000 shows superior reinforcement properties compared to non-coated fibres.

It can be expected that the higher reinforcement of sulphur silane coated fibres is also beneficial for the wear performance of the friction material.

## APPLICATIONS FOR RB225-ROXUL®1000

RB225-Roxul®1000 is especially suitable for the following rubber bonded friction applications:



## CONTACT

Lapinus Fibres  
P.O. Box 1160  
NL-6040KD Roermond  
The Netherlands

Telephone: +31 475 353555  
Telefax: +31 475 353677  
E-mail: [lapinus@lapinusfibres.com](mailto:lapinus@lapinusfibres.com)  
Web address: [www.lapinusfibres.com](http://www.lapinusfibres.com)

