

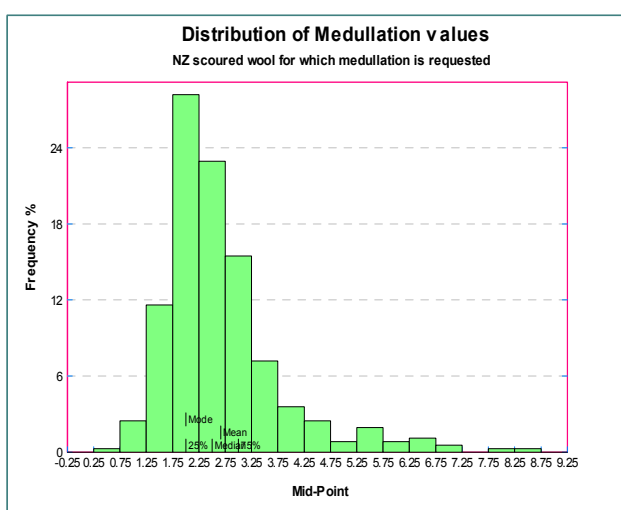
# SGS Wool Testing Services = Info-bulletin

## Medullation in NZ carpet wool consignments

### Introduction

Info-bulletin 5.4 introduces the subject of medullation. Most New Zealand carpet wool contains some medullation, and for some applications, medullation is desirable because it helps stiffen the fibre structure.

We are often asked to provide some guidelines as to what levels of medullation can be expected. The following plot shows the distribution of medullation values that we have obtained on New Zealand wools over the last 2 years. It is important to recognise, however, that this distribution only applies to those wools for which we have been asked to measure medullation, so it may not be a completely representative sample.



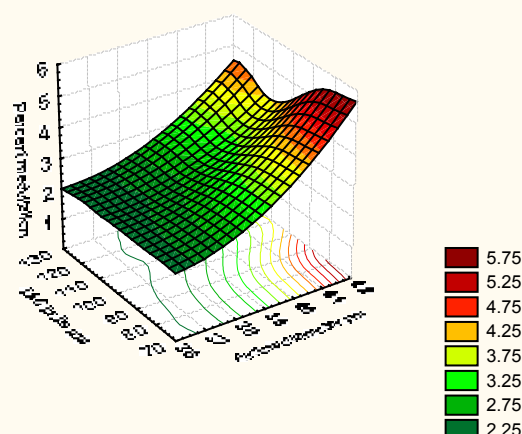
This histogram illustrates that most results fell in the 1.5 to 3% range, but that values of up to 9% have been measured. The average level in the samples we tested was 2.6%, and 95% of the results were below 5% medullation. Only 2.2% of the samples tested exceeded 6% medullation.

### Relationship with other properties

Medullation is often specified by breed and classing distinctions, because in general terms there is little relationship with other wool properties, other than the generalisation that coarser wool tend to have more medullation. However, medullation can vary independently of diameter, even within a breed, depending on the diet of the sheep.

The trends within the limited database of measurements available for scoured consignments of NZ carpet wools can be summarised in the surface plot reproduced in the next column. This indicates that, amongst the wools presented for measurement, increasing diameter tended to give increasing medullation, as expected. Coarser wools which measure

Medullation as a function of fibre length & diameter  
NZ carpet wools for which medullation tests requested



shorter in the Length After Carding test also tended to have the highest medullation levels. However, some of the longer wools also showed similarly elevated levels, so fibre length is not much of a guideline. Certainly, for wools with diameters below 39  $\mu\text{m}$ , there was no discernable relationship between fibre length and percent medullation.

### Medullation & diameter measurement

Medullated fibres are less dense than normal fibres, and therefore a fixed mass of fibre containing medullation will contain more fibres than one in which there is no medullation. In the airflow test, therefore, wools containing medullated fibres will appear to be finer than if measured by projection microscope, OFDA or Laserscan. Medullated fibres can also be differentially removed by Shirley Analysing. Some work has been carried out to predict airflow results from OFDA measurements, although this has not been widely used.

### Effects of medullation on processing

Whilst there has been comment that medullated wools have poorer spinning performance, there has been some evidence, albeit from several decades ago, that in Romney hogget wools of 33  $\mu\text{m}$ , medullation levels of up to 4.6% didn't affect processing performance. Other sources have suggested that up to 15% medullation shouldn't cause difficulties in spinning. Highly medullated wools may also have lower processing yields, especially in the worsted system.

Yarn hairiness, irregularity and stiffness may be adversely affected by significant levels of medullation.

Medullation is most commonly criticised for effects due to differential dye take-up, and whilst this causes problems for some knitwear, for other woollen and carpet products this effect has been used for visual effect. The degree of effect is also dependent on the colour applied - pastels and yellows, for example, are often good colours for disguising kemp, whilst blues, browns and blacks tend to show them in high contrast.