

## THE IMPORTANCE OF BULK IN WOOLLEN CARPETS

### BACKGROUND

Along with other characteristics, density is a key indicator of carpet quality. This is because it relates to how well the carpet will ‘bounce back’ after walking across it. Carpet density is generally influenced by the yarn quality and how close the fibres are tufted together. A heavier carpet is likely to be denser and will normally last longer. While wool is recognised around the world as being the ultimate fibre for top-quality carpets, not all wool is the same. This resistance to compression is a key attribute that can be determined in the raw material.

The various breeds of sheep produce wool of differing characteristics. ‘Bulk’ relates to the ability of wool to fill space. Wool with high bulk can make carpets look plush and provide ‘warmth without weight’ – this is a significant benefit in applications such as airplanes and cruise boats where extra weight is a negative factor.



### BULK MEASUREMENT

The measurement of bulk is carried out as prescribed in the NZ Standard NZS8716. It uses core samples drawn from bales which are washed, dried, conditioned then carded. The randomly aligned fibres from the carding are weighed and carefully placed into a cylinder and compressed several times to establish the space the wool occupies, in cc/gm.

### Bulk in New Zealand sheep breeds

The main sheep breeds in New Zealand exhibit quite varying levels of bulk. Because of the range of genetic material, there are even large differences within breed variances.

BREED	WOOL TYPE	CORE BULK RANGE (cm <sup>3</sup> /g)
Lincoln/Leister	Lustre	18 - 23
Coopworth	Medium strong cross-bred	20 - 24
Romney	Medium strong cross-bred	21 - 25
Drysdale	Medullated	23 - 26
Perendale	Fine – medium cross-bred	24 - 30
Corriedale	Medium	23 – 29
Half-bred	Medium	24 - 30
Texel	Crimpy	24 - 30
East Friesian	Crimpy	24 - 30
Merino	Fine	27 - 32
Downcross	Crimpy	30 - 35
Cheviot	Crimpy	29 - 34
Down	Crimpy	30 - 36

### Bulk and other wool characteristics

Bulk is largely determined by fibre crimp and by fibre diameter. Staple crimp is indicative of fibre crimp, but the two are not the same, as staple crimp usually reflects crimp definition rather than fibre curvature.

Coarser wools tend to have lower bulk due to a reduction in crimp frequency. However, the influence of fibre shape and stiffness mean that fibre diameter alone is not a satisfactory indicator of bulk.

There is no established relationship between fibre length and bulk.

Medullation tends to increase bulk. Medullated fibres are like tubes, and for the same weight there is more volume of wool. Medullated wools also have a higher proportion of coarse fibres. These coarser fibres tend to resist bending.

While there are statistical correlations between fibre curvature and bulk, further standardisation of the measurement of curvature is needed before the measurement can be used. However, it may provide useful information in ranking animals within a flock.

### **Bulk in processing**

High bulk wools are particularly suited to filling material used in bedding, quilting in jackets and protective clothing, and pillows, replacing the likes of down/feather fillings in Europe and cotton in futons in Japan. They generally have a high fibre crimp frequency and therefore produce a higher volume of product for the same weight than lower bulk wools. This means that the bulky wools can trap more air, which improves wools insulating properties. Their suitability for bedding is also enhanced by their ability to resist felting and fibre migration. They are therefore more resilient and retain their original loft, or thickness.

When used in carpets, bulky wools give improved pile density and a fuller and more luxurious feel underfoot. When used in knitwear, the bulky wools create warmth and comfort without weight, and retain their shape better.

Fine wool of the same core bulk will produce yarn of higher bulk than coarser wool.

### **Bulk in modern composite breeds**

The introduction of composite (exotic) breeds into the New Zealand sheep industry is reputed to have created better lamb production, however it has led to a decrease in fleece weight. While this has had a negative impact on the amount of wool sold, it may inadvertently have provided an increase in bulk. Some of these breeds have provided benefits to breeding flocks in terms of bulk.

*For more information on carpet bulk testing,  
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