

## THE RELATIVE MERITS OF 100 % WOOL AND WOOL / SYNTHETIC BLEND CARPETS\*

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### 1. BLENDS OF 80 % WOOL AND 20 % NYLON

#### 1.1. Introduction

A high proportion of woven carpets in UK, and a smaller proportion of tufted cut - pile carpets, have a pile composed of 80 % wool and 20 % nylon. The presence of such carpets in other countries, resulting from UK exports, has led to manufacturers in these countries to consider the production of 80 / 20 wool / nylon carpets. This report attempts to review the technical factors which must be considered when deciding whether to make a carpet in 100 % wool or 80 / 20 wool / nylon.

#### 1.2. Manufacturing

Yarns from 80 / 20 blends are stronger than 100 % wool yarns, but blending also introduces disadvantages, and no important changes in processing costs may be expected.

##### Blending

Blending of 80 / 20 blends must be carried out particularly carefully to avoid faults in the carpet due to local high concentration of nylon.

Blend costs will be lower for the wool / synthetic blend because of the lower price of some nylons. This can lower the total cost of making the carpet up to 9 % , depending on whether premium nylon or sub - standard nylon is used, and whether the quality of wool is reduced, relying on the nylon to provide yarn strength. Maximum saving can only be achieved by lowering the quality of the carpet, e.g. by using waste which may contain undrawn nylon.

Care should be taken in using percentage mark-up calculations, since profits per square meter may be reduced.

##### Spinning

No significant changes in efficiency may be expected provided that the fibres are compatible, i.e. the correct denier and staple length of nylon has been used.

##### Dyeing

Nylon tends to absorb dye more quickly than wool but its saturation point is lower. In dark colours wool absorbs more dye than nylon. Techniques are available for minimising problems associated with differential dye effects between the two fibres, but mistakes are easily made. Dyeing of 80 / 20 blends costs little more than 100 % wool, but more skill is required. Failure to achieve equal colour distribution between wool and nylon can give problems of streaks in plain carpets and local changes in the colour of the carpet due to differential wear.

##### Mothproofing

In general the anionic type of mothproofing agent (e.g. Eulan U 33 Mitin LP etc) has a greater affinity for nylon

than wool to the extent of a 4:1 distribution in favour of nylon. To combat this, larger quantities of mothproofing agent need to be used in order that a sufficient quantity of agent will exhaust onto the wool component. This makes the mothproofing operation much less economic. It is possible to use some blocking agents similar to those used in dyeing wool / nylon blends but they are only partially effective.

The use of nonionic Pyrethroid type mothproofing agents present much less of a problem since the distribution ratio is about 1:1.

##### Carpet Conversion

There is a slight tendency for manufacturing efficiencies to be lower for cut pile qualities in 80 / 20, due to cutting difficulties and down time due to sharpening of knives. It should be noted that surveys of tufting efficiencies have shown that yarn joints are a much more frequent source of stoppages than weak yarn.

#### 1.3. Consumer Satisfaction

The main motivation for producing 80 / 20 carpets is to obtain a commercial advantage by producing a carpet which provides consumer satisfaction with a lower cost yarn. As pointed out in the section on blending this is not always guaranteed by changing to an 80 / 20 blend.

Apart from faults present when the carpet is laid, the principal complaints about carpets concern changes in appearance and premature wear. Changes in appearance are more likely when the carpet is particularly badly constructed. It should be noted that contract carpets in commercial locations (restaurants, hotels, banks etc) are usually rejected when their appearance becomes unsatisfactory rather than because they are worn to the backing.

##### Durability

No laboratory equipment for abrasion resistance testing can be used to compare all fibres. In particular, the results for 100 % wool and blends of wool and nylon should not be compared as a basis for blend selection.

While there is usually a greater carpet abrasion resistance for an 80 / 20 quality, compared with that of a similar weight 100 % wool quality (practical stair trials have shown that wear life may be greater by a factor of 1.5) this is not always the case. For commercial reasons, lower quality nylons and wools are often blended and this results in lower abrasion resistance figures than expected. The difference in abrasion resistance is smaller for heavier carpets, but the performance of a poorly constructed carpet will not be improved by changing the yarn from 100 % wool to 80 / 20 wool / nylon blend.

##### Resilience

Equal thickness loss in wear the same response to light or heavy furniture is obtained from 80 / 20 and from 100 % wool carpets.

##### Pilling

The use 80 / 20 blends in loop pile carpets will promote pilling in most locations. The problem looks worse because the stronger nylon fibres retain the pills on the carpet surface whereas in 100 % wool products any pills

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