SIZE OF YARNS

One of the methods used by the textile industry for measuring yarn size is the 'direct method' which relies on the measurement of a fixed length of yarn. A specified length of yarn is measured and this length is weighed. The units used are ***tex, decitex*** and ***denier.***

The definition of these units are:-

TEX	*The mass in grams of 1km of staple yarn.*
DECITEX	*The mass in grams of 10,000m of filament yarn.*
DENIER	*The mass in grams of 9,000m of yarn.*

From these definitions it will be seen that a) the higher the number the coarser the yarn and, b) the cross sectional area or diameter of a given yarn measure will vary in proportion with the density of the yarn.

To give particular examples of this we can look at monofilament PTFE and Nylon 11 yarns. PTFE has a density of 2.18g/cm3 and Nylon a density of 1.14g/cm3.

If we take yarns of 10 and 20mm diameter then 10,000m of these diameters have volumes of 0.785 and 3.14cm3 respectively.

From the above the following can be found:-

10mm Diameter PTFE x 10,000m long has a mass of 1.711g therefore = 1.71dtex (1.54 denier)
20mm Diameter PTFE x 10,000m long has a mass of 6.850g therefore = 6.85dtex (6.17 denier)
20mm Diameter Nylon11 x 10,000m long has a mass of 3.580g therefore = 3.58dtex (3.47 denier)

Most filtration needlefelt fabrics are made using yarns around 3 to 3.5 dtex although there are exceptions to this and some commonly used yarns are manufactured in a range of dtex sizes.

A few typical yarn diameters presently used are: - PTFE 14mm
P84 31mm (2.2dtex)
Ryton 23mm