

**NEEDLEPUNCHING UPDATE**

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**Abstract**

Needling is a versatile nonwoven manufacturing process with the advantages that (if available in web form) all fibres can be needled including continuous filaments, at fabric widths and with a range of thickness/density values which are beyond other bonding processes. The nature of the process also makes it ideal for producing stratified structures by joining different substrates

This paper will outline some of the available upgrade opportunities for existing and new needlefelt lines which can improve production capacity, felt quality and properties. These range from the web drafter which allows optimum card utilization even on lightweight fabrics to uniformity control and elliptical motion needlelooms.

Elliptical needling minimizes uncontrolled draft in the needling zone and finds increased use in technical applications. In addition because higher advance/stroke values are possible throughput speed can be increased.

Control of weight variation not only improves product quality but also reduces the amount of fibre used to meet specification. Felt initial modulus can now be controlled by incorporating a drafting zone in the loom take off system.

A new approach will also be described which allows high quality needlefelt to be produced in the 30-80 gsm weight range. This involves intense needling with single barb needles which are intended to transfer only a single fibre during each penetration. In this way higher punch densities than would normally be expected with such light weight webs can be used to produce a cohesive structure without excessive drafting and web distortion. Throughput speeds in excess of 100m/min are achieved with several needlelooms in tandem. This development makes needling a viable bonding process throughout the overall nonwoven fabric weight range from < 100gsm to > 2000gsm depending on application.

Cotton and cotton blends are needled in the same way as other fibres assuming a satisfactory web can be produced. Cotton webs are very dense and hence needle selection is important to avoid excessive punching loads and needle breakage. For the same reason needleboard density is also kept low.