DEFINITIONS OF FABRIC FILTRATION TERMS

GENERAL TERMS

- **Needle Felt:** Filtration media manufactured by mechanically bonding layers of staple fibers to a base cloth (scrim) by means of a fiber interlocking machine. Needles are used in this machine to punch the fibers through the fiber mass and lock them to each other.

- **Scrim:** The openly woven substrate fabric that forms the base of needle felts. This light weight woven fabric can be seen in the middle of the "felt sandwich" in a cross-section view. Many in the industry regard the scrim as reinforcing bar in the felt. They point to the scrim as being responsible for lending burst and tear strength to the needle felt.

- **Thermoplastic Fibers:** Fibers that melt at their melt point. Thermoplastic fibers include polyester, polypropylene and Ryton®. These fibers are good candidates for finishing.

- **Non-thermoplastic Fibers:** Homopolymer acrylic, NOMEX®, P-84™, Fiberglass and PTFE do not melt and as a result are not candidates for most conventional finishing techniques.

- **Epitropic® Fibers:** Carbon or other anti-static elements are blended into a fiber mix to help reduce the dangers of static build-up and electrical discharge. Epitropic felts are popular in areas where baghouse explosions are anticipated.

- **ePTFE Membrane:** ePTFE membrane is a thin film produced by expanding microporous polytetrafluoroethylene. The slick membrane surface provides excellent dust cake release. In the process of manufacturing the ePTFE membrane, microporous holes are opened in the membrane that permit the passage of gases but not particulate. These pores can be regulated to various sizes and applied to specific applications as required. Various thicknesses, efficiencies and pore size openings of ePTFE membrane can be manufactured to meet the most stringent requirements.

- **Condensation Polymer Fiber:** A major cause of filter bag failure is the chemical reaction known as hydrolysis. Hydrolysis is defined as a chemical process of decomposition that involves splitting molecular bonds with the addition of water molecules.

  The man-made fibers that are made from condensation polymers are subject to hydrolysis. These condensation polymers include: polyester, nylon, polyimide (P-84) and aramids (Nomex and Conex®).

  Many production processes generate moisture and chemistry (either acidic or alkaline) at elevated temperatures, forming the ideal conditions for hydrolysis. All three elements, elevated temperature, moisture and chemistry, must be present to activate hydrolysis.

Homopolymer acrylic and Ryton fibers are not produced from condensation polymers and are often selected to replace fibers when hydrolysis exists.

When Nomex fibers hydrolyze at elevated temperature beyond 275^{o}F (135^{o}C), the alternative is Ryton fibers.

FINISHES

- ✧ **Plain:** The natural surface of the felt after it has been heat-set to a 2% residual shrinkage level. The surface has a natural softness attributed to the open fibers. These fibers aid in the capture of fine particulate. They also hold the residual dust cake, perhaps retarding good cake release.

- ✧ **Singed:** The plain finished felt is taken through an open gas oven where the surface fibers are melted. The rough texture of this finish is regulated by the time and temperature to which the felt is subjected in the finishing process. This is the most basic finish to assist in the release of dust cake under tough conditions.

- ✧ **Glazing:** The plain finished felt is subjected to both high temperature and pressure over hot calendar rolls to smooth the surface by melting and pressing the surface fibers. This finish imparts and excellent cake release surface and has been referred to as “eggshell”or “mirror” finish. The drawback to this finish is that the melted fibers close off much of the felt surface and reduce the permeability, restricting air flow. This is not a popular finish because of its higher pressure drop without a resultant improvement in filtration.

- ✧ **Foam-coated Felt:** This coating was developed in response to the success of Goretex® ePTFE membrane years before the arrival of Tetratrex. Open cell foams are sprayed onto the plain felts and cured to a smooth surface. This smooth surface simulates the cake release characteristics of ePTFE membrane, but does not accomplish much with respect to improved efficiency. Many felt manufacturers developed their own proprietary foam coatings and have gone to great lengths to show improvements in efficiency.

- ✧ **Felts with ePTFE Membrane:** Separately manufactured to a rigid set of specifications, the ePTFE membrane is thermobonded to the surface of the media using pressure and temperature. In the case of thermoplastic fibers, it is necessary to singe the fabrics to provide the proper surface for bonding Tetratex ePTFE membrane. Non-thermoplastic fibers must be treated with Telfon® B to provide a substance to which the membrane will bond successfully. In addition, some felts of specially fibers require a proprietary treatment to achieve optimal thermobond characteristics.