

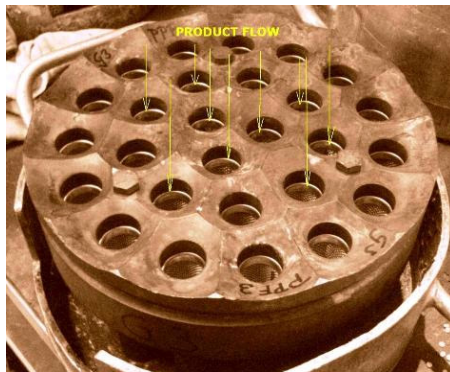
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The use of laminated Filters in Extrusion Screen Packs

On several occasions our customers have made us aware of continuous problems with Extrusion screen packs.

Large capacity Extrusion lines are equipped with Screen changers and rapid changeover screen packs. These screen packs typically contain a specific number of filters which are inserted into cartridges and/or kept in place by means of some type of holder. *(design of your screen may differ from generic images)*



Basically the filters should keep pollution and foreign objects out of the melt that flows towards the die-plate. Dirt, or worse, foreign objects which find their way though the barrel & screw are potentially hazardous for the die-plate, cutting face and knives. Unfortunately there are many incidents of this type happening at any extrusion plant.

ROOT CAUSE:

The screen pack & filters perform a good job but the weakest element in the chain is the wire-mesh material which makes up the filter.

In standard aftermarket applications the filters typically consist of one single layer of wire mesh sometimes held together with a pressed-on aluminium or steel ring which also doubles as seal to seat the filter into the screen pack. There is also no continuous weld along the seam where the woven mesh end meet.



Unfortunately this type of design & material is not sturdy enough to withstand high temps and pressures of the melt.

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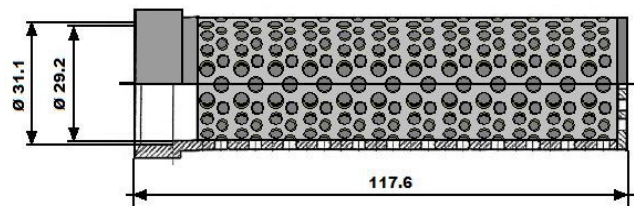


Under extreme pressure filter mesh may shear off and is pushed inside the filter cartridge by the flux where it blocks the lower half of the holes. That filter has not only lost its filtering capacity, it will also burn away partially.

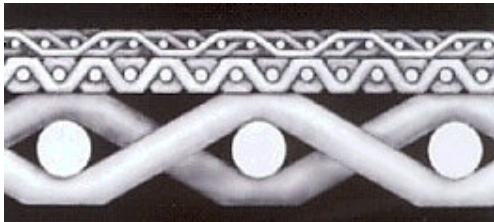
There is a great risk of portions of the wire mesh breaking away and entering the polymer circuit. Filter debris will damage the back face of the die-plate and may penetrate into heating channels. Sections of wire may obstruct production holes and, if small enough to travel as far forward as the production

holes they get squeezed between the edge of the production nozzle and the granulation knives. Knives can break and the die-plate cutting face may crack under this violent shock. Even if no damage was inflicted on the equipment, the fact remains that product quality is compromised through pollution in the polymer. *Some of your customers may even refuse the total production batch!*

Now that we have identified the cause of many failures filters, what options are open to alter & improve the material: Size, shape and dimensions of the filters and -holders are fixed by the manufacturer of the screen-pack/screen changer and under no circumstances flow-rate may be reduced or compromised.



IMPROVED MATERIAL CHARACTERISTICS:



The only solution therefore lies in the manufacture of a sturdier type of filter-mesh material. This material is composed of 3 laminated layers of filter wire mesh material: There are 2 layers of wide mesh that sport rather large diameters of woven SS AISI 304 wires and which make for a very sturdy and hard wearing filter-structure. The fine wire mesh

sieves out particles. This 3-ply structure is called TopMesh® and is available in many MESH-sizes & combinations. This material has mechanical properties that approach those of a solid steel plate: It can be cut, drilled and welded as if it were steel plate.

Topmesh® material is pressed into the appropriate shape and all edges are completely seam-welded for additional strenght. The problems with the top ring on OEM filters have been overcome by seam-welding a **solid** Stainless Steel machined ring onto the top of the filter.



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ENDURANCE TESTS:

Over the last 12 to 18 months TopMesh® Filters were submitted to rigorous testing at several plants operating different types of extrusion lines. These endurance tests were closely monitored and documented by the owners/operators of the said equipment.

No changes in process parameters were noted during operation and production circumstances: i.e. the Topmesh® filters perform along identical lines as the OEM prescribed examples and do not require recalibration of the equipment. After several weeks/months of continuous use the screen-packs containing the Topmesh® filters were removed and cleaned. All filters proved to be 100% intact and fully functional. Depending on the make & model of the screen pack some filters may even be re-used on condition that the removal and cleaning is carefully done.

In rare instances where the OEM filter cartridge holder completely lost its lower section, the customer confirmed that the Topmesh® filter's integrity was not compromised and the wire mesh did not succumb to pressure or temperature. (as can be seen in the picture)



RANGE:

Topmesh® material is available as 2-ply or 3-ply in several mesh-type configurations. The material is suitable for most types, makes and shapes of screens and screen-pack filters. It is already widely used for regular extrusion and other applications.



We currently have a number of commonly used filter types for extrusion equipment in our inventory. Please contact us for availability. We also welcome inquiries on types that have not yet been listed. Please forward make and type of extrusion equipment and possibly drawings and/or a sample of the filter or screen that is currently in use.

Price-wise you will find that the Topmesh® type filters have a higher priced bracket than single-layer filter mesh but the reliability and longevity of this material far outweighs its higher price. Great financial savings will be made through better protection of the granulation equipment (dieplate & knives) and improved product quality.

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