

MICROSPUN PRODUCTS

FILTER CARTRIDGES

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1.0 INTRODUCTION

The present document includes data concerning filter cartridges produced by Microspun Products, using well defined layers. The layers are built from bonded polymer fibers of specific and controlled structure, lined up on stiff inner core.

All MicroSpun PP filter cartridges feature high filtration efficiency, low pressure drop and high dust capacity. The cartridges stopping 0.5 μm to 20 μm particles are defined as absolute filters. The filtration efficiency defined as the quotient of the number of particles before and after the filter (*beta ratio*) is 1000. The cartridges of the 30 μm to 90 μm range also feature high filtration efficiency. These cartridges are used as coarse filters, and do not have to act as absolute ones. However, they must feature high dust capacity. The MicroSpun PP cartridges fit into majority of industrial filtration housings containing one or more filter elements. They can also be used in the standard PP, PCV and polycarbonate housings. The cartridges are also available with special endcaps with the „o-ring” gaskets providing high efficiency.

In view of continuous research and development of our products, Microspun Products Ltd. reserves the right to change specification without prior notice.

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2.0 QUALITY GUARANTEE

All Microspun products are produced within the *Quality Management System* based on ISO 9001 and AQAP 2110 requirements.

Product quality is guaranteed by the closed loop of production process control (**control of process data and data acquisition – SCADA**), regular check of finished products and random check performed during production.

The filtration parameters are checked in samples collected from each production batch, while measurements of the pressure drop, used for quality check, are performed online during the process. All filter cartridges are supplied with the Product Certificate including information on the product code, description and client order details concerning each shipment.

Every single element features burned out code on its side, helpful for its future traceability.

3.0 PRODUCT TRACEABILITY

Microspun Products *Quality Management System* ensures full traceability of each product.

Every filter cartridge is identified by:

- **Product code** – burned out on every element and printed (alphanumerically and in bar code) on package label, and on the box used for shipment,
- **Serial number** – burned out on every element and printed on package label, and on the box used for shipment,

The codes allow for full retroactive traceability of the product, down to raw material certificates, machine settings and production parameters, production dates, names of operators, test data, etc.

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4.0 CERTIFICATES

4.1 Biological safety

The Microspun PP cartridges meet all requirements of the US FDA/CDRH: CFR21 (Food and Drug Administration).

4.2 Usage authorization

All Microspun products have the attestation HŻ/13162/01 granted by the National Institute of Hygiene (Państwowy Zakład Higieny), approving their contact with drinking water, alcoholic beverages, spirit, vinegar and edible oil.

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5.0 SPECIFICATION

5.1 Product labeling

All MicroSpun PP cartridges have a burned out marking defining their gradation corresponding to the absolute filtration efficiency for particles of specific size (in micrometers). The full product code is placed on the package and includes:

- cartridge type (04 – absolute, for liquids)
- filtration material
- core material,
- size of particles (in micrometers) that are filtered with the absolute efficiency (gradation),
- filter cartridge length (in inches),
- type of endcap,
- gasket type (o-ring or flat),
- marking details.

Element numbers are lined in the following sequence::

04 □ □ □□□□ – □□ □ □ □

Category	Filtration material	Core material	Gradation	Length	Endcap type	Gasket	Marking type
04	P = polypropylene	P = polypropylene	000 = 0,5 μm	09 = 251 mm	0 = code 0	E = EP	P = „No Name”
		N = polyamide	001 = 1 μm	10 = 254 mm	2 = code 2	B = NBR	M = Microspun
			003 = 3 μm	20 = 508 mm	3 = code 3	S = silicone	B = Client
			30 = 762 mm	7 = code 7	V = „Viton”	
			120 = 120 μm	40 = 1016 mm	8 = code 8	P = PE	

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5.0 SPECIFICATION

5.2 Raw materials

All polypropylene Microspun PP cartridges are made of the following materials:

- filtration material - polypropylene,
- core - polypropylene or polyamide,
- endcaps - polypropylene,
- PE gaskets - foamed polyethylene thermally glued into filtration cartridge,
- "o-ring" gaskets- EP, NBR, silicone, "Viton"

All production materials meet the requirements of the USA FDA CFR Entitlement 21, and are safe in contact with foodstuffs.

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5.0 SPECIFICATION

5.3 Dimensions

Inner diameter	27,5	±0,5 mm
Outer diameter	64	± 2 mm
Length 10''	254	± 1 mm
Length 20''	508	± 1 mm
Length 30''	762	± 1 mm
Length 40''	1016	± 1 mm

On customer's request we can produce filter cartridges of custom dimensions, up to 60'' – 1524mm and various inner and outer diameters

5.4 Filtration efficiency

Filter type efficiency 99.9%

04PP 000	0.5 μ
04PP 001	1 μ
04PP 003	3 μ
04PP 005	5 μ
04PP 010	10 μ
04PP 020	20 μ

The cartridges stopping 0.5 μm to 20 μm particles are considered absolute filters with efficiency of 99.9% . The filtration efficiency, defined by the quotient of the number of particles before and after the filter (*beta ratio*), is ≥ 1000 .

filter type efficiency 99%

04PP 030	30 μ
04PP 050	50 μ
04PP 070	70 μ
04PP 090	90 μ

The 30μ to 90μ-range cartridges feature efficiency of 99%.

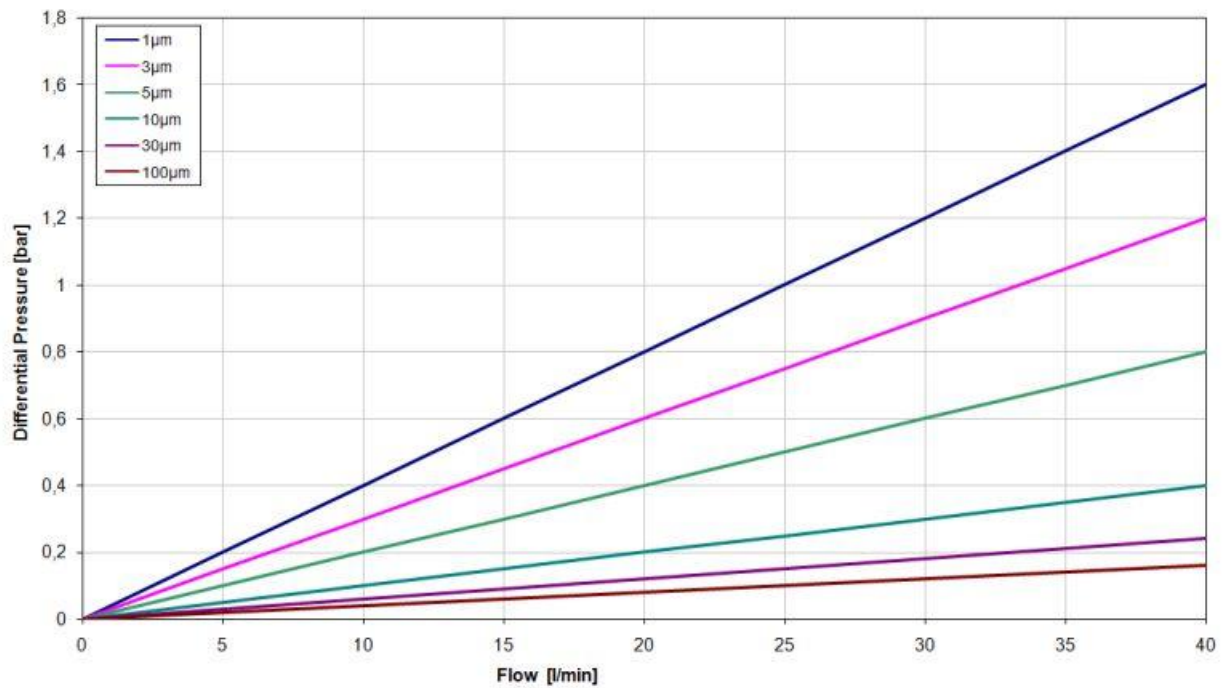
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5.0 SPECIFICATION

5.5 Flow characteristics

The graph below presents relationship between pressure drop in the filter and volumetric flow intensity of water flowing through the filter.

Typical Flow vs. Differential Pressure



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Features	Merits	Advantages
Defibration using melt-blown polymer method	High flow intensity and low flow resistance. No re-emission during work.	High quality of filtration.
Variable porosity.	Outer layers act as prefilters that protect inner layers acting as absolute filters. High dust capacity.	Low filtration costs prolonged exploitation period.
Diversified fiber diameters.	High filtration efficiency for wide range of diameters of removed impurities.	Pure filtrate. Longer period of use, lower filtration costs
Absolute filter structure	High efficiency of particie removal..	Repeatable filtration process in particular applications
Structural core.	Efficient functioning of the filter possible at higher pressure levels Good functioning at elevated temperature. Nonwoven structure acts only as filtration material	May be applied in more demanding filtration processes. Uniform behaviour during filtration
Range of core lengths up to 1,500 mm.	Minimum risk of bypassing in, comparison to filtration cartridges with combined cores	Ensures higher product quality. Fast cartridge exchange
All cartridge elements are made of the same polymer type	Wide range of applications for various chemical agents	No limitations that are observed in case of cartridges made of various polymers..
Cartridges do not contain other materials, binders, etc..	During exploitation period, the cartridge does not emit any impurities..	Special applications possible..
Materials approved for contact with foodstuffs..	May be used for edible fluids and pharmaceutical industry applications	Safe non-toxic filtration in special situations.
Thermally joined gaskets	Improved gasket eliminating the chance for flow bypasses.	Constant filtration coefficient within the whole cartridge exploitation period

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Applications for filtrating fluids in various industries and technologies:

Food industry,
Medical industry,
Optical manufacturing,
Pharmaceutic industry,
Photographic industry,
Automotive industry,
Drink processing,
Coatings industry,
Cosmetics,
Oil and gas industry,
Electronics,
Energetics.