VP Series

STEAM FILTERS

MAIN APPLICATIONS:

- FINE CHEMICAL
- PETROCHEMICAL
- OIL & GAS
- FOOD & BEVERAGE
- PHARMACEUTICAL
- POWER GENERATION
- GENERAL INDUSTRY

The steam, is a fluid used in a multiple number of applications. In the industrial area is used to produce energy, to evaporate solvents or hydrocarbons, to heat, to vulcanize rubber, to warm washing water, etc. Also, it is widely used as a sterilizing agent in pharmaceutical processes and in the food and beverages industries.
Steam, during production stage and pipeline transportation, pick-up a considerable quantity of rust and scale that must be filtered to prevent damaging or fouling the downstream equipment like sterile filters, heat exchangers, valves, etc.
It is therefore important to provide adequate steam filtration to remove contaminants dragged; according to the application to which it is intended, the steam is classified into the following categories that define the purity levels required:

- Process steam: chemical industries, refineries, laundries, HVAC.
- Filtered steam (or culinary steam): food and beverage industries.
- Clean steam: food and beverage industries, hospitals, cosmetic industries.
- Pure steam: pharmaceutical and biotechnology industries.

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STEAM APPLICATIONS:

- **Fluids or equipment heating**
- **Autoclaves sterilization**
- **Fermenters sterilization**
- **Membrane filter sterilization**
- **Plant sterilization**
- **Clean rooms humidification**
- **Food stuff cooking**
- **Direct pastorization**

Filtration rating selection rules:

Process steam	Culinary steam	Clean steam
- Directly from boiler - No direct contact with the finish product	- 95% retention of > 2 µm particles in the liquid phase - SS-304 material as minimum - Boiler additives conform with CFR Title 21, Chapter 1, Part 173, Section 173.310	- Steam condensate to WFI standards
Applications	**Applications**	**Applications**
- Heating in general - Heating jacket feed - Biological waste sanitization	- Use in direct contact with food and beverage - Use in direct contact with food processing equipment and HVAC system	- Use in the production of pharmaceutical products - Use for HVAC system of pharmaceutical plants
Recommended cartridges	**Recommended cartridges**	**Recommended cartridges**
Required only if steam is used to sterilize liquid or gas cartridge filters	Selection depends from flow parameters	For removal of magnetite particles generated from stainless steel pipe due to corrosive purity of clean steam
25 µm - WM, SP, SM series Used for relatively low flow-rate	**1 µm - SP, SM series** Used for relatively low flow-rate	**0.5 µm - SP series** Used for magnetite particles removal
5 µm - SFGP-SLGP series Used for high flow-rate and high dirt holding capacity	**1 µm - SF series** Used for high flow-rate	**1 µm - SP, SM, SF, SLGP series** For steam filtered < 5 µm conform to HTM 2031 requisition at point of use
	1 µm - SLGP series Used for high flow-rate	

Process steam: also called industrial steam, is the lower quality steam. The process steam is suitable for all applications in which is not in direct contact with foodstuff raw materials. The process steam can be used in the heat exchangers, in the boilers, etc.; it is usually produced using pre-treated water, due to softening, de-alkalinisation, or reverse osmosis: to prevent corrosions, deposits and scales.

Culinary steam: it is steam that has been purified through a 5 µm rated stainless steel filter. A 5 µm filtering element is suitable to remove 95% of all particles ≥ 2 µm and it's, in the Unites States, recognized as suitable for the production of culinary steam. When using a 5 µm filter, it is advisable to provide a pre-filter upstream (typically 150 µm rated) to avoid a too fast clogging.

Clean steam: is the higher purity degree of the steam used for the production of food and beverages; usually, is made with decontaminated water through a dedicated steam generator. The clean steam is used for critical production processes. The design of the steam distribution network, selection of materials and the installation procedures are critical for the contamination control up to its point of use.

Pure steam: represent the evolution of the clean steam for the pharmaceutical and bio-technology industries. The purity and quality characteristics of pure steam are higher than current requirements of the legislation related to food and beverage industries.
Pure steam is produced using a dedicated steam generator, manufactured and operated in conformity to the rules for pharmaceutical products fabrication (GMP). Its condensate purity level, will meet the specification governing the injectable water.

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Design criteria for steam filters:

One of the main criteria to be considered in the design of steam filters, is its velocity in pipes and nozzles. Highest is the steam velocity, highest will be the Delta-P; also, an high steam velocity, impose, either the connections that the filter body to an high mechanical stress since any water droplets entrained in the steam have an high abrasive effect.
The steam filters must therefore be whereas both the Delta-P that the velocity of the steam must be maintained within acceptable value:

- Nozzles velocity: < 25 - 30 m/s.
- Delta-P ≤ 0.15 bar with SP series filtering cartridges
- Delta-P ≤ 0.1 bar with SF, SLGP, SM, WM series cartridges

Available filter media:

WM series filtering cartridges

Filter media:	Pleated 316L-SS wire mesh
Filtration rating:	5 to 1000 µm
Main application:	Process steam

SM series filtering cartridges

Filter media:	Multiple layers 316L-SS sintered wire mesh
Filtration rating:	1 to 45 µm (in gas filtration)
Application:	Process steam, culinary steam, clean steam

SP series filtering cartridges

Filter media:	316L-SS sintered powder
Filtration rating:	0.3 to 15 µm (in gas filtration)
Application:	Process steam, culinary steam, clean steam

SF/SLGP series filtering cartridges

Filter media:	Pleated 316L-SS sintered fibres
Filtration rating:	0.3 to 20 µm (in gas filtration)
Application:	Process steam, culinary steam, clean steam

All the components of the above filtering cartridges are manufactured with materials suitable for food contact and are conform to the FDA Title 21 requisition as well as to the 1953/2004/EC Directive.

Steam characteristics:

Pressure (bar g)	Pressure (bar a)	Temperature (°C)	Spec. weight (kg/m³)	Spec. volume (m³/kg)	Viscosity (cP)
0.0	1.013	100.00	0.597	1.673	0.0122
0.5	1.513	111.60	0.869	1.150	0.0126
1.0	2.013	120.42	1.135	0.880	0.0129
1.5	2.513	127.62	1.398	0.715	0.0132
2.0	3.013	133.69	1.657	0.60	0.0134
2.5	3.513	139.02	1.914	0.52	0.0136
3.0	4.013	143.75	2.168	0.46	0.0137
3.5	4.513	148.02	2.422	0.41	0.0139
4.0	5.013	151.96	2.674	0.37	0.0140
4.5	5.513	155.55	2.924	0.34	0.0141
5.0	6.013	158.92	3.174	0.32	0.0142
6.0	7.013	165.04	3.672	0.27	0.0145
7.0	8.013	170.50	4.166	0.24	0.0146
8.0	9.013	175.43	4.659	0.22	0.0148
9.0	10.013	179.97	5.150	0.19	0.0150
10.0	11.013	184.13	5.641	0.17	0.0151

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Housing				Filter element			Flow-rate [kg/h]		
Model	Nozzles	P max.	T max.	Qty	Series	H	Grade	2 bar	6 bar
SCD10SSA01M SCT10SSA01N-ST	1" GAS-F 1" NPT-F	19.7 bar 25 bar	180 °C 200 °C	1	WMGP	10"	10	40	80
							25	60	100
					SMHC	10"	2	15	30
							5	55	70
							10	60	100
					SPK	10"	1	9	20
							5	50	120
							10	50	120
					SFGP	10"	3	26	100
							5	35	140
							10	35	140
HCD20SSA1HM	1.1/2" GAS-F	11.8 bar	180 °C	1	WMGP	20"	10	80	160
							25	120	200
					SMHC	20"	2	30	60
							5	110	140
							10	120	200
					SPK	20"	1	18	40
							5	100	240
							10	100	240
					SFGP	20"	3	55	200
							5	70	280
							10	70	280
MTM032SZ02T	2" GAS-M	7.9 bar	180 °C	3	WMGP	20"	10	240	480
							25	340	600
					SMHC	20"	2	90	180
							5	330	420
							10	340	600
					SPK	20"	1	55	120
							5	300	720
							10	300	720
					SFGP	20"	3	165	600
							5	210	780
							10	210	780
MTF052SZ03T	3" GAS-M	7.9 bar	180 °C	5	WMGP	20"	10	400	800
							25	600	1000
					SMHC	20"	2	150	300
							5	550	700
							10	600	1000
					SPK	20"	1	90	200
							5	500	1200
							10	500	1200
					SFGP	20"	3	275	1000
							5	350	1400
							10	350	1400

Flow-rate referred to saturated steam with Delta-P at clean filter: 0.15 bar.

1935/2004/EC Directive Conformity Declaration available upon request for both filter housings and filtering cartridges.

For the filter housings and filtering cartridges dimension or characteristics please refer to their specific brochure.
For filters with different dimensions, flow-rate and max. working pressure that above, contact Asco Filtri.

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