

FILTRATION SOLUTIONS

STEAM FILTRATION



Steam Filtration

Steam is ubiquitous within the process industry and as such is often neglected in terms of correct conditioning. Poor quality steam can result in damaged filtration systems, contaminated final product and incomplete sterilisation due to condensate build up. Amazon Filters have a comprehensive range of filtration products to ensure your process runs trouble free whatever your application or industry.

The provision of a continuous supply of steam appropriate for the process is a combination of good pipework system design and the correct selection of steam filter.

Filter Construction

Amazon filters offer two filter constructions dependant on the final application. All filters are fully welded 316L.



Pleated sintered metal mesh: Use for multiround filtration systems or the sterilisation of large pieces of equipment such as fermenters, intermediate product holding tanks where general particulate removal is required



Pleated sintered metal fibre: Use for culinary grade filtration due to its high efficiency and flow capacity

Filter Selection

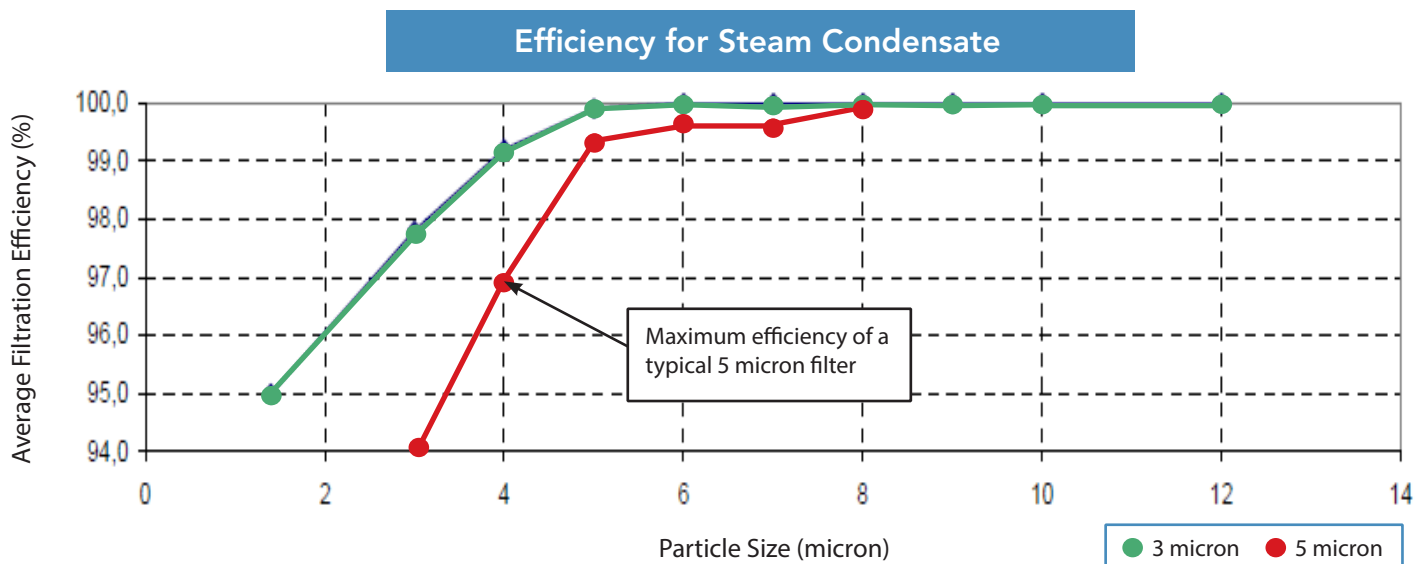
The steam filter provides three main functions dependent on the application

1. Removal of debris that can affect the efficiency of heat exchangers
2. Removal of particulate generated from the boiler and pipework to protect the sterilising gas filter
3. Removal of particulate to allow steam to come into contact with the final product

When producing steam that will come into contact with the final product either directly or indirectly in the food & beverage industry it must be of culinary grade (3A-609-03). This means the boiler should only use FDA approved corrosion inhibitors and it should be filtered as close to the point of use as possible with a filter that provides 95% retention of 2 micron particles. While **dry saturated** steam is the goal, in practice, the steam will be between 90 and 95% dryness fraction. This entrained water results in the efficiency of the filter being reduced from maximum in dry conditions to a potential minimum in a system with bulk condensate present (This can often happen when initiating sterilisation on large pieces of process equipment).

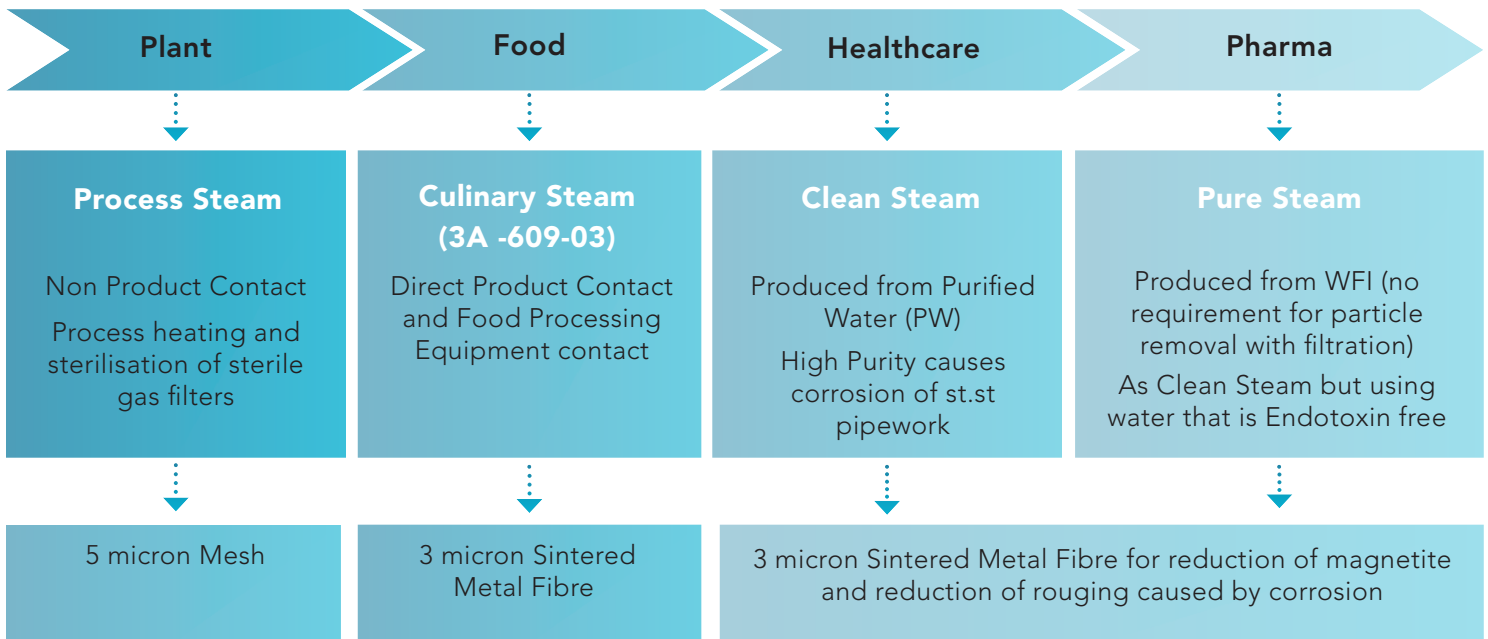
For this reason Amazon Filters always specify a filter rated at 3 micron in liquid. The exceptional flow capacity of the stainless steel sintered metal fibre media ensures that this increased efficiency can be retrofitted into existing systems without compromising system performance.

For Pharmaceutical and Healthcare systems the steam is usually generated from Purified Water or WFI. The only particulate that may be present is liberated from the Stainless Steel pipework as a result of the corrosive nature of the highly purified steam. In these cases a 3 micron sintered metal fiber can be used to reduce the magnetite deposited on process equipment and thereby reduce the potential of rousing.



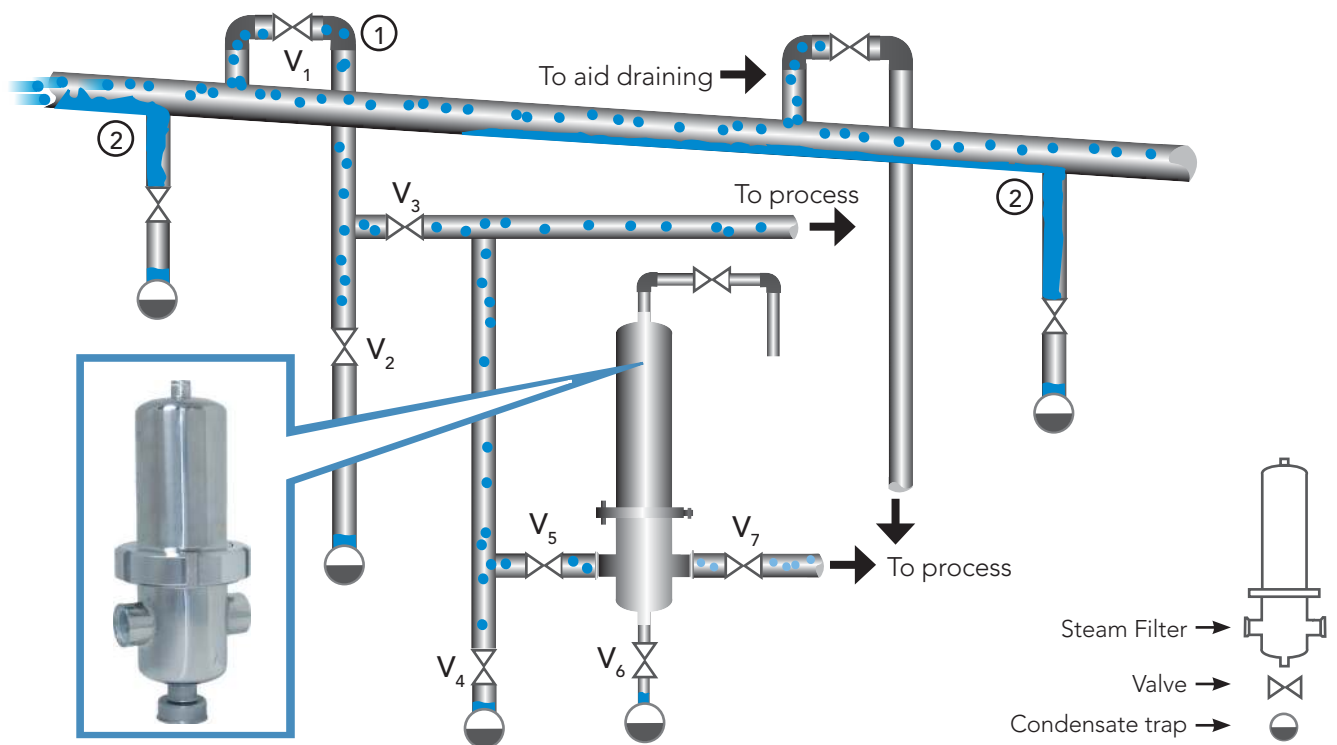
Product Selection by Application

Increasing Quality Requirements



Process Pipework Design

The enemy of valves, filters and the process is condensate. Correct placement and operation of condensate traps in the steam delivery system will eliminate 99% of problems.



- Branch lines to the process should exit the top of the main distribution line to minimize condensate carry-over
- Condensate drains on the main line should be installed to prevent build up of condensate as complete blockage could occur resulting in 'Water Hammer'

On automated as well as manual systems always adhere to the rule 'Never allow a valve to open to a filter or process until the condensate has been removed from the pipework immediately in front of it'. This very simple rule can save a lot of problems

Steam Filter Sizing

Housing	Connection (ANSI SHD 40)	Steam Velocity (m/sec)	Capacity (kg/hr) @1 barg 120°C	Typical dp Pleated	Typical dp Wrapped
Junior (7401J)	1"	25	57	<50	<100
		40	91	<100	<250
5" (7401 - 10)	1.5"	25	134	<50	<100
		40	214	<100	<250
10" (7401 - 11)	2"	25	221	<50	<100
		40	354	<100	<250
3x10"	3"	25	500	<50	<100
		40	780	<100	<250

Steam Pressure Correction Factors

Pressure	0	1	2	3	4	5	6
Correction Factor	0.5	1	1.5	2.0	2.5	3.0	3.5

To calculate the steam capacity other than at 1 barg multiply the mass flow at 1 barg by the correction factor at the appropriate pressure

Ordering Guide

05SF	B	003 -	09	0	E	A	
Media/Core	Core/Assembly	Micron Rating		Length	End Caps	Seal	Branding
05SS - 316 Stainless Steel Mesh 05SF - 316 Stainless Metal Fibre	B - Cylindrical + Support P - Pleated + Support	SS - Mesh 005 - 5µm	SF - Fibre 003 - 3µm	09 - 250 19 - 500 29 - 750	0 - Code 0 2 - Code 2 3 - Code 3 7 - Code 7 8 - Code 8	E - EPDM V - Viton	A - Amazon

Example: 05SFB003-090EA = Cylindrical Stainless metal fibre, 3µm rating, single length 10" long (247mm), code 0 connections with EPDM seal.

Complimentary Products

To help ensure your process and the filters continue to perform to the optimum Amazon have a wide range of complimentary products. A brief overview is given below. For more detailed information refer to the individual product datasheets.

Housings

To facilitate the efficient draining of condensate and prevention of increased differential pressures during operation is advised that specific **74 Series** sterile gas / steam housings. The inclusion of a plenum base, swept bends and larger inlet and outlet connection significantly minimise pressure drops.



PTFE Membrane Filters

For point of use steam where the temperature is 135°C or less the **SupaPore TPB** can be used for complete particle removal for applications such as the production of creams and ointments in the pharmaceuticals.



AMAZON FILTERS LTD.

Albany Park Estate, Camberley, Surrey, GU16 7PG, ENGLAND

Tel. +44 (0) 1276 670 600 Email. sales@amazonfilters.co.uk Web: www.amazonfilters.com

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