

Characteristics of multi functional type MMF Filter element

1. INTRODUCTION

Asahi Fiber Industry's MMF Filter element is formed by adhering fibers at each intersection by heating the thermal bonded ultrafine polypropylene fiber as material. It has excellent resistance to chemicals and capability of microfiltration, although it has longer filter life since filtration rate can be large because pressure loss is small with continuous density gradient for outer to inner.

Fig 1. is products of MMF filter element. As it is build to order system, we will make specific size of filter which customer request. Although it is the product 100% made in Japan from 100% Japanese polypropylene material, so customer can rely on the quality.



Fig1. Products of MMF Filter element

2. FEATURE OF MMF FILTER ELEMENT

- ① It is the filter element which is made from thermal bonded ultrafine polypropylene fiber. (Fig2., Fig3.)
- ② Excellent chemical resistance since material is 100% polypropylene, and it is applicable to use for wide range of liquid filtration because of the elution from filter element is very few.
- ③ Filtration flow rate is large with even low pressure since resistance for water or air is small because filter element has continuous density gradient. (Fig4.)
- ④ We can produce conventional size of cartridge and also the required size of filter as customer requested in reasonable price.
- ⑤ It is the product 100% made in Japan from 100% Japanese polypropylene material, also made in Japan. so customer can rely on the quality.

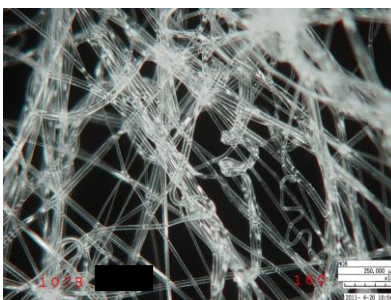


Fig2. Adhering of fibers
【model:MMF-107B】

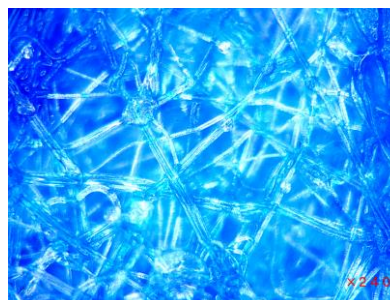


Fig3. Surface of filter layer
【model:MMF-0086】



Fig4. Cross section of filter layer
【model:MMF-0086】

3. CHARACTERISTICS OF MMF FILTER ELEMENT

3-1) Relationship between aeration speed and air flow resistance of MMF filter element

Fig5. shows the measurement result of air flow resistance as Aeration speed is as parameter when the air passed each grade of MMF Filter element which is made in different condition. Thickness of each filter element is 16mm. As you can see from Fig5. we can make filter of various type of air flow resistance by changing the material condition.

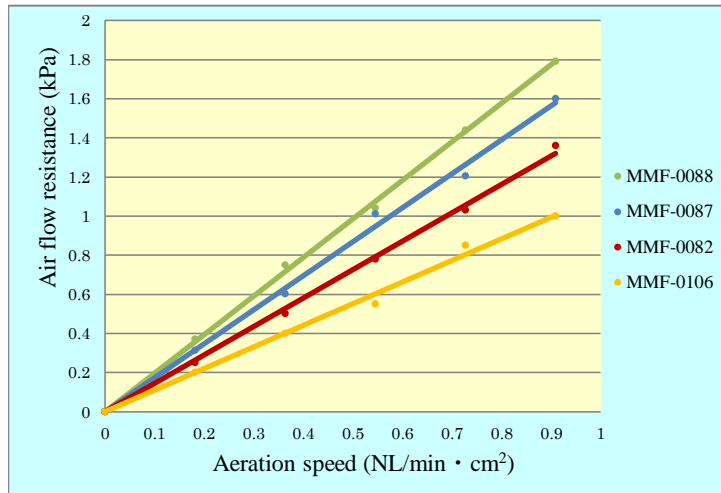


Fig5.
Relationship between aeration speed and air flow resistance of various type of MMF filter element which are made in different conditions

3-2) Relationship between water conduction speed and water flow resistance of MMF filter element

Fig6. shows the measurement result of water flow resistance as water conduction speed is as parameter when the air passed each grade of MMF Filter element which is made in different condition. Thickness of each filter element is 16mm. As you can see from Fig6. we can make filter of various type of water flow resistance by changing the material condition

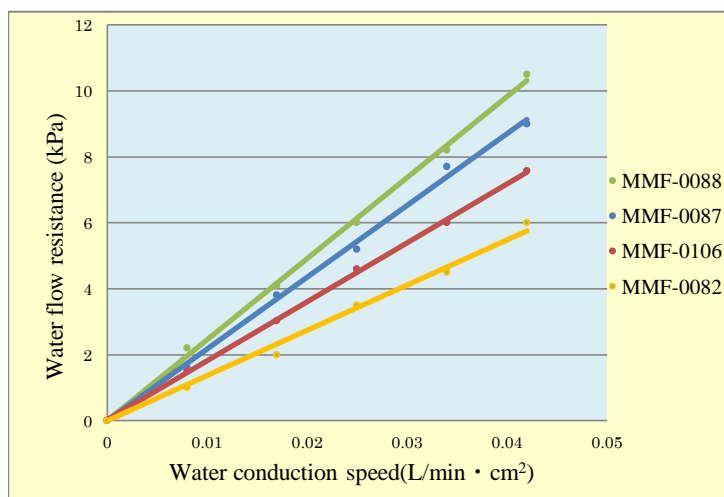


Fig6.
Relationship between water conduction speed and water flow resistance of various type of MMF filter element which are made in different conditions

3-3) Filtration clarity of MMF Filter element

Filtration clarity of MMF Filter element is discriminated by measuring the gap of particle in between “raw water which particles are added” and “filtrate which has passed through the equipment by constant rate filtration which is described as Fig7. in certain time”

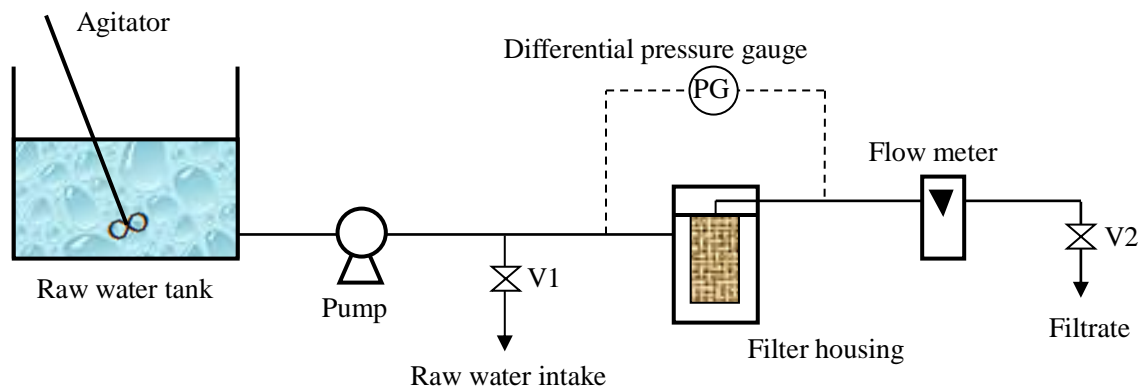


Fig7. Flow sheet of filtration experiment

Type of particles which we put in raw water tank is selected from JIS standard particle (or similar) for experiment according to the measured porosity and ventilation resistance of MMF Filter element.

We use JIS standard particle, blend of several type of JIS standard particle or blend of original particles by our company.

The few example of JIS standard particles which we use to discriminate the filtration clarity of MMF Filter element is listed in Table.1

Table1. Example of JIS standard particles

JIS standard particles	Range of particles diameter	Material
Class 1	45 μ m~300 μ m	Silica sand
Class 7	5 μ m~75 μ m	Kanto loam
Class 9	2 μ m~16 μ m	Talc
AC dust Fine(A2)	1 μ m~100 μ m	Arizona test dust

Fig8. is the rejection ratio of particle by MMF filter element made by each grade of thermal bonded fiber sheet. The thickness of the Filter element is 16mm and the filtration speed is 10m/hour.

As you can see from Fig 8. we can make filter of various filtration clarity by changing the condition of . We will adjust filtration clarity as required by customer and it is easy to control filtration and quality by using our filter.

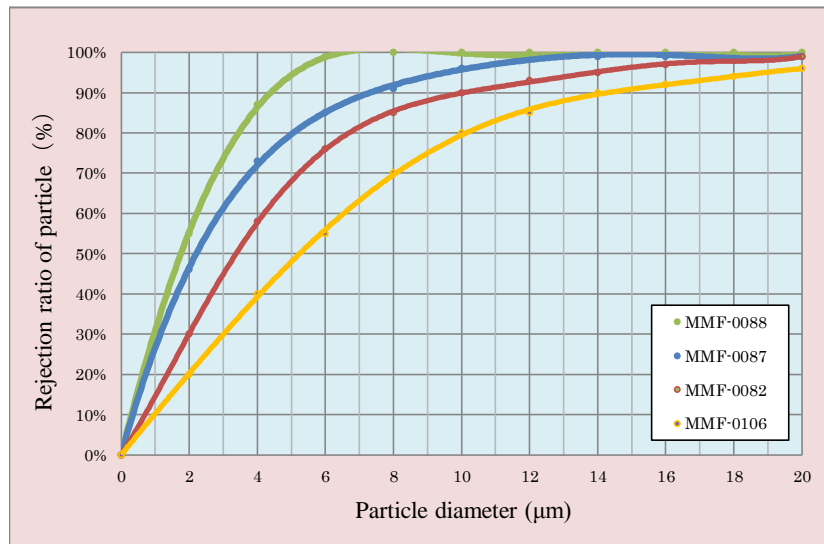


Fig8. Rejection ratio of particle by MMF Filter element

4. RESISTANCE TO CHEMICAL

Table2. Resistance to chemicals

CHEMICAL	COMPATIBILITY	CHEMICAL	COMPATIBILITY
10% hydrochloric acid	○	toluene	○
10% nitric acid	○	formalin	○
10% sulfuric acid	○	copper sulfate plating liquid	○
10% sodium hydroxide	○	100% Olive oil	○
10% sodium carbonate (Na ₂ CO ₃)	○	kerosin	○
1% sodium hypochlorite	△	soybean oil	○
100% ethyl alcohol	○		

※Chemical resistance could be influenced depends on liquid temperature, filtration pressure and filtration time.

We recommend to examine chemical resistance before actual use.