

The below text is copied from a post by Rich H on the sailboatowners.com. For reference, Rich H pops up on numerous forums regarding fuel discussions. He is thought of as an expert in the subject. -

Yanmar specifies 15-18 $\mu$ M for that small engine mounted 'guard' filter. The Society of Automotive Engineers very long ago identified and specified 20 $\mu$ M as 'the most damaging' (hard) particle in a diesel engine.

Typical filtration for 98% of most diesel engines is: tank --> 30 $\mu$ M (optional prefilter) --> **10 $\mu$ M** (main or 'workhorse') filter --> 15-18 $\mu$ M (engine mounted 'guard' filter) --> engine. All these filters are at 95-97% removal efficiency at the  $\mu$ M rating - called 'nominal' rating.

It takes 'work' to accomplish filtration. Using a 2 $\mu$ M in place of a 10 $\mu$ M will: cause 1/5 to 1/10 the onstream filter life as in nature the smaller the particle the exponentially more of them ... a 2 $\mu$ M will block up and shut down flow about 10 times FASTER than a 10 $\mu$ M; 2 $\mu$ M will take 5X the pressure across the filter to make that filter deliver the exact same 'flow' and will/may cause premature failure of the engines lift pump diaphragm. If for some undefined reason you MUST use a 2 $\mu$ M instead of a 10 $\mu$ M you then should increase the surface area of that 2 $\mu$ M filter (or use FIVE 2 $\mu$ M filters in a parallel arrangement and with all 2 $\mu$ M filters 'working') in place of that single 10 $\mu$ M.

Additionally, most particles in diesel fuel are soft and deformable; a 2 $\mu$ M filter will tend to 'extrude' these particles through a 2 $\mu$ M and since these soft/deformable particles do not 'burn' very well, will settle out in the exhaust system down stream of the combustion chambers and form thick 'coke' deposits on the walls of the exhaust system. Also too, a 2 $\mu$ M will also 'coalesce' particles much smaller than 2 $\mu$ M together, causing them to 'agglomerate' and grow into even larger particles downstream of that filter.

A few Ford and a few Volvo engines specify the usage of a 2 $\mu$ M.

**30 $\mu$ M (optional) ---> 10 $\mu$ M --> 15-18 $\mu$ M** engine 'guard' or 'last chance' filter.

The relative small surface area of that 15-18 $\mu$ M 'guard' filter will quickly plug and auto shut down the engine if any of the preceding filters break a pleat or start extruding a massive amount soft particles ... its really there only as a 'last chance' filter.

NO technically sound reason to use a 2 $\mu$ M filter on 98% of diesel engines.