

BestRestium Testing Part 3 - Conducted 03/01/19

Filter brand	Type filter	inHg before BT	inHg after Bt	Rise in pressure (inHg) after 30 gm BestRestium	inHg after 30 gm talc	inHg after BT and talc, no cartridge	Weight of cartridge before BT (grams)	Weight of cartridge after BT (grams)	Increase in cartridge weight (grams)	Weight of cartridge before talc (grams)	Weight of cartridge after talc (grams)	Increase in cartridge weight (grams)
Listed in alphabetical order												
Guglatech 1	dry, no oil	1.268	2.620	1.352	3.834	1.336	42.718	43.289	0.571	46.634	47.216	0.582
Guglatech 2	oiled on top only - Italy	1.155	2.103	0.948	3.915	1.492	41.418	41.817	0.399	43.180	43.800	0.620
Guglatech 3	oiled top & bottom	1.266	2.451	1.185	3.934	1.378	45.878	46.340	0.462	40.814	41.444	0.630
K&N	oiled cloth	1.384	2.555	1.171	3.785	0.750	42.251	42.908	0.657	42.815	43.482	0.667
Mahle	paper	1.409	2.079	0.670	3.631	0.564	39.955	40.301	0.346	40.125	40.611	0.486
Uni	oiled foam	1.330	2.251	0.921	3.187	0.409	48.546	49.307	0.761	41.832	42.400	0.568

Grid 1. Listed in rise in pressure after 30 grams of BestRestium (lowest number first) percentage increase based on lowest value % increase

Mahle	paper	1.409	2.079	0.670	3.631	0.564	39.955	40.301	0.346	40.125	40.611	0.486	1.000
Uni	oiled foam	1.330	2.251	0.921	3.187	0.409	48.546	49.307	0.761	41.832	42.400	0.568	1.375
Guglatech 2	Oiled top only - Italy	1.155	2.103	0.948	3.915	1.492	41.418	41.817	0.399	43.180	43.800	0.620	1.415
K&N	oiled cloth	1.384	2.555	1.171	3.785	0.750	42.251	42.908	0.657	42.815	43.482	0.667	1.748
Guglatech 3	Oiled top & bottom	1.266	2.451	1.185	3.934	1.378	45.878	46.340	0.462	40.814	41.444	0.630	1.769
Guglatech 1	dry matrix	1.268	2.620	1.352	3.834	1.336	42.718	43.289	0.571	46.634	47.216	0.582	2.018

Grid 2. Listed in rise in pressure after 30 grams of talc (lowest number first) percentage increase based on lowest value % increase

Uni	oiled foam	1.330	2.251	0.921	3.187	0.409	48.546	49.307	0.761	41.832	42.400	0.568	1.000
Mahle	paper	1.409	2.079	0.670	3.631	0.564	39.955	40.301	0.346	40.125	40.611	0.486	1.139
K&N	oiled cloth	1.384	2.555	1.171	3.785	0.750	42.251	42.908	0.657	42.815	43.482	0.667	1.188
Guglatech 1	dry matrix	1.268	2.620	1.352	3.834	1.336	42.718	43.289	0.571	46.634	47.216	0.582	1.203
Guglatech 2	Oiled top only - Italy	1.155	2.103	0.948	3.915	1.492	41.418	41.817	0.399	43.180	43.800	0.620	1.228
Guglatech 3	Oiled top & bottom	1.266	2.451	1.185	3.934	1.378	45.878	46.340	0.462	40.814	41.444	0.630	1.234

Grid 3. Listed by rise in pressure after 30 grams BestRestium AND 30 grams talc (lowest number first) percentage increase based on lowest value % increase

Uni	oiled foam	1.330	2.251	0.921	3.187	0.409	48.546	49.307	0.761	41.832	42.400	0.568	1.000
Mahle	paper	1.409	2.079	0.670	3.631	0.564	39.955	40.301	0.346	40.125	40.611	0.486	1.379
K&N	oiled cloth	1.384	2.555	1.171	3.785	0.750	42.251	42.908	0.657	42.815	43.482	0.667	1.834
Guglatech 1	dry matrix	1.268	2.620	1.352	3.834	1.336	42.718	43.289	0.571	46.634	47.216	0.582	3.267
Guglatech 3	Oiled top & bottom	1.266	2.451	1.185	3.934	1.378	45.878	46.340	0.462	40.814	41.444	0.630	3.369
Guglatech 2	Oiled top only - Italy	1.155	2.103	0.948	3.915	1.492	41.418	41.817	0.399	43.180	43.800	0.620	3.648

Grid 4. Listed by increase in weight of secondary cartridge with 30 grams BestRestium (lowest number first) percentage increase based on lowest value % increase

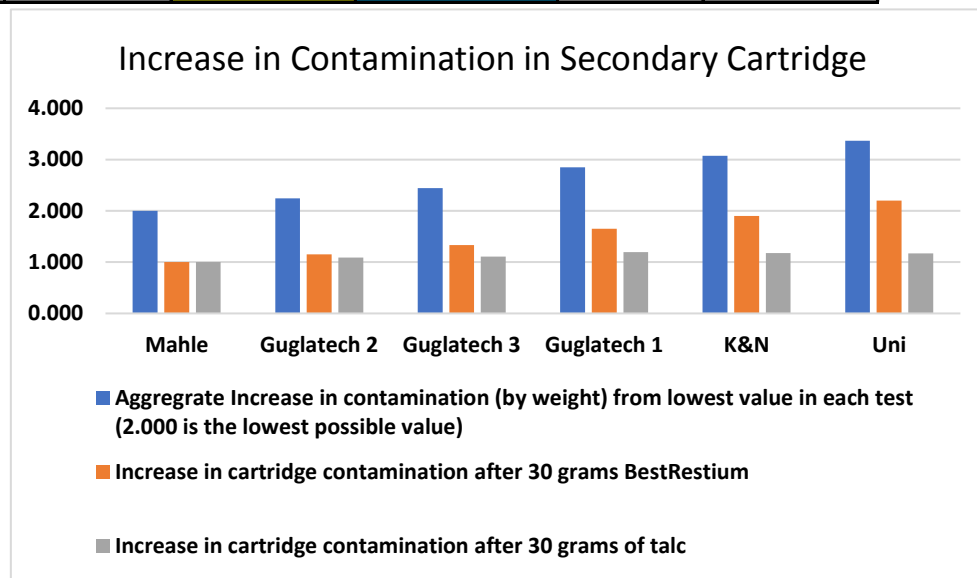
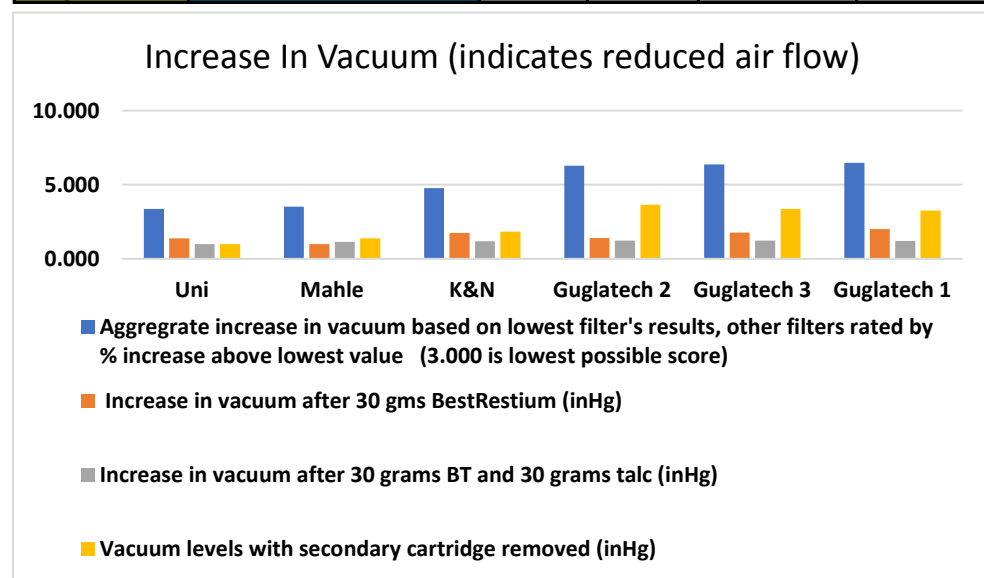
Mahle test 2	paper	1.409	2.079	0.670	3.631	0.564	39.955	40.301	0.346	40.125	40.611	0.486	1.000
Guglatech 2	Oiled top only - Italy	1.155	2.103	0.948	3.915	1.492	41.418	41.817	0.399	43.180	43.800	0.620	1.153
Guglatech 3	Oiled top & bottom	1.266	2.451	1.185	3.934	1.378	45.878	46.340	0.462	40.814	41.444	0.630	1.335
Guglatech 1	dry matrix	1.268	2.620	1.352	3.834	1.336	42.718	43.289	0.571	46.634	47.216	0.582	1.650
K&N	oiled cloth	1.384	2.555	1.171	3.785	0.750	42.251	42.908	0.657	42.815	43.482	0.667	1.899
Uni	oiled foam	1.330	2.251	0.921	3.187	0.409	48.546	49.307	0.761	41.832	42.400	0.568	2.199

Grid 5. Listed by increase in weight of secondary cartridge with 30 grams talc (lowest number first) percentage increase based on lowest value % increase

Mahle test 2	paper	1.409	2.079	0.670	3.631	0.564	39.955	40.301	0.346	40.125	40.611	0.486	1.000
Uni	oiled foam	1.330	2.251	0.921	3.187	0.409	48.546	49.307	0.761	41.832	42.400	0.568	1.169

Guglatech 1	dry matrix	1.268	2.620	1.352	3.834	1.336	42.718	43.289	0.571	46.634	47.216	0.582	1.198
Guglatech 2	Oiled top only - Italy	1.155	2.103	0.948	3.915	1.492	41.418	41.817	0.399	43.180	43.800	0.620	1.092
Guglatech 3	Oiled top & bottom	1.266	2.451	1.185	3.934	1.378	45.878	46.340	0.462	40.814	41.444	0.630	1.109
K&N	oiled cloth	1.384	2.555	1.171	3.785	0.750	42.251	42.908	0.657	42.815	43.482	0.667	1.174

	Aggregate increase in vacuum based on lowest filter's results, other filters rated by % increase above lowest value (3.000 is lowest possible score)	Increase in vacuum after 30 gms BestRestium (inHg)	Increase in vacuum after 30 grams BT and 30 grams talc	Vacuum levels with secondary cartridge removed (inHg)			Aggregate Increase in contamination (by weight) from lowest value in each test (2.000 is the lowest possible value)	Increase in cartridge contamination after 30 grams BestRestium	Increase in cartridge contamination after 30 grams of talc
Uni	3.375	1.375	1.000	1.000		Mahle	2.000	1.000	1.000
Mahle	3.518	1.000	1.139	1.379		Guglatech 2	2.245	1.153	1.092
K&N	4.770	1.748	1.188	1.834		Guglatech 3	2.444	1.335	1.109
Guglatech 2	6.291	1.415	1.228	3.648		Guglatech 1	2.848	1.650	1.198
Guglatech 3	6.372	1.769	1.234	3.369		K&N	3.073	1.899	1.174
Guglatech 1	6.488	2.018	1.203	3.267		Uni	3.368	2.199	1.169



From an analysis of the above results, we see that maximum airflow generally corresponds to an increase in contamination (by weight) that passes through the main filter, and is trapped in the secondary cartridge. Contamination trapped in the secondary filter means those particles would've passed into your engine, which would result in excessive wear.

Engine experts report that most engine wear is the result of particulates measuring 5-20 microns. Our tests used particulates measuring 20-50 microns (BestRestium) and 10 microns (magnesium silicate - talc).

The Mahle paper filter (equivalent to the BMW OEM paper filter) shows good results, ranking #2 in pressure readings, #1 in contamination. The Mahle filter is not re-usable and must be replaced when it gets dirty. Other filters we tested can be cleaned and re-used. The Uni had the lowest rise in (negative) pressure, but allowed the highest levels of contamination to pass onto the secondary cartridge. The Guglatech filters had the highest rise in (negative) pressure, but much lower levels of contamination when compared to K&N and Uni. Based on a comparison of the 3 Guglatech filters, the best way to oil a Guglatech filters is on the top side (only).

Filter costs	Brand	Type		Price	Re-Use Cost
	BMW	paper		\$32.50	\$0.00 one-time use not tested in this film - see Part II

Mahle	paper		\$12.07	\$0.00	one-time use		
Hiflofiltro	paper		\$13.14	\$0.00	one-time use	not tested in this film - see Part II	
Guglatech	dry matrix		\$70.00	\$7.00	one-time use		
Guglatech	oiled matrix top only		\$70.00	\$7.00	add costs of chemicals to re-oil (\$7.00)		
Guglatech	oiled matrix both sides		\$70.00	\$7.00	add costs of chemicals to re-oil (\$7.00)		
K&N	oiled cloth		\$39.99	\$15.00	add costs of chemicals to clean and re-oil (\$15.00)		
Uni	oiled foam		\$26.30	\$19.00	add costs of chemicals to clean and re-oil (\$19.00)		

