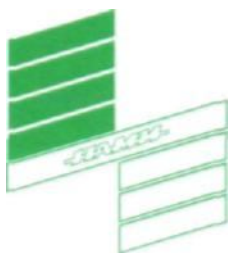


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APPROVED

Testing Center Director
V.I. Volkov

TEST PROTOCOL

1. ITEMS TO BE TESTED

Samples of automotive oil filters to be used in internal combustion engines: TO-1190 (TOTACHI. Totachi Industrial Co., Ltd Japan), 04152-37010 (TOYOTA, Toyota Motor Corp. Thailand) and HU 6006z (MANN FILTER, MANN-HUMMEL GmbH, Germany).

The marking, containing the manufacturer's name, trademark, bar code and product designation are applied to the filters and their packaging.

2. TEST OBJECTIVE

The objective of the given tests is to define, whether the aforementioned filters meet the requirements of the Technical Regulations of the Customs Union 018/2011 "On the safety of wheeled vehicles" (Appendix No10, paragraph 79) and GOST R 53844-2010 "Automotive vehicles. Secondary oil filters for car, tractor and combine harvester engines. Technical requirements and test methods".

3. SCOPE AND PROCEDURE OF TESTS

Tests were conducted according to the procedures set forth in GOST R 53844-2010 on the bench stand, certified at the GOST R 8.568-97, with Lukoil engine oil (Service Category SF / CC, viscosity grade 10W-40) at a temperature of 80°C. Hydraulic characteristics of filtering elements were determined using spacer corresponding to GOST R ISO 4548-1-2009 "Test methods for full-flow oil filters for internal combustion engines. Part 1: Dependence of pressure differential versus flow rate".

4. TEST RESULTS

Results, obtained during tests of oil filters, are given in the table.

5. SUMMARY

Tests of the oil filters have shown that they comply with the requirements of the Technical Regulations of the Customs Union 018/2011 “On the safety of wheeled vehicles” (Appendix №10 79) and GOST R 53844-2010 "Automotive vehicles. Secondary oil filters for car, tractor and combine harvester engines. Technical requirements and test methods”.

Senior Research Engineer

I.A. Markelov (Signed)

Parameters	Parameter values			
	At the GOST R 53844-2010 (Section 4)	At the tests		
		Totachi TO-1190	Toyota 04152-37010	MANN HU 6006z
1. Hydraulic resistance of filters at the flow of 1000 l/h and $t_m = 80^{\circ}\text{C}$, MPa	At the design documentation, not more than 0,030 MPa	0,012	0,012	0,011
2. Completeness of filtering, %	Not less than 25 (from 35 to 65%)	59	48	42
3. Fineness of filtering, microns	Not more than 57* (from 25 to 45 microns)	30	31	44
4. Pressure differential on the filter element, till destruction, Mpa	2 ΔP of valve opening Not less than 0,1 MPa	>0,20	>0,20	>0,20
5. Filtering element work surface area, cm^2	At the design documentation, not less than 500 cm^2	817	665	493
6. Weight of 1 m^2 of filtering screen element, g	Not rated (150-200)	199	263	197
7. Filter replacement interval, 1000 km	not less than 10,0	>15**	>15**	>15**

* The value for fineness of filtering has been obtained by calculation according to the formula, set forth in the GOST R 53844-2010;

** Expert review.