



OIL, ENGINE, INITIAL AND SERVICE FILL, SAE 5W-30

WSS-M2C913-D

1. SCOPE

This material specification defines the minimum acceptable performance requirements and physical/chemical properties of engine oils to be used by Ford Motor Company in its worldwide engine/vehicle manufacturing and service operations.

2. APPLICATION

This specification is released in Europe and, where applicable, in RoW for initial fill engine oils used for lubrication of spark ignition engines using gasoline and for compression ignition engines using diesel fuels. The specification is also used for servicing Ford engines where applicable. The Section 3.1 titled STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS applies only to engine oils supplied directly to Ford Motor Company and / or it's affiliates.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 PERFORMANCE

Shall meet all the requirements of "ACEA European Oil Sequences A5/B5-10" and additional Ford requirements.

3.2.1 Fuel Efficiency

Average of 3 CEC M111 fuel economy engine tests

M111 Fuel Economy
(CEC L-54-T-96)

3.0% improvement min on
average of 3 tests min

3.2.2 Ford In-house Test for Chain Wear (Consult Ford Motor Company for specific requirements)

Where applicable, the required engine tests shall be conducted in accordance with the most recently approved procedures as described in the ACEA sequences.

All tests under surveillance by ASTM must be conducted using test equipment monitored by and calibrated to the requirements of the ASTM Test Monitoring Center.

All engine performance testing used to support a claim of compliance with the ACEA sequences must be generated according to the EELQMS. Suppliers must demonstrate commitment to comply with the ATIEL Code of Practice.

Date	Action	Revisions	Rev. 0
2011 11 18	Activated		S. Abdelhalim. D. Witt, FoE





3.3 VISCOSITY GRADE

Shall meet all the requirements of the applicable SAE viscosity grade as defined in SAE Standard J300 (latest revision), "Engine Oil Viscosity Classification".

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| 3.3.1 | Low Temperature Pumping Viscosity, at -35 °C
(ASTM D4684, MRV TP-1) | 60,000 mPa.s max |
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3.4 PHYSICAL/CHEMICAL PROPERTIES

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| 3.4.1 | Copper Corrosion
(ASTM D130 or ISO 2160, 3 h at 100 °C) | 1b max
(Dark Orange) |
| 3.4.2 | Gelation Index
(ASTM D5133, Scanning Brookfield) | 12 max |
| 3.4.3 | Foaming
(High Temperature, ASTM D6082) | 100/0 ml max |
| 3.4.4 | Seal Compatibility
Shall be compatible with all current production component materials Including timing belt material (HNBR). | |
| 3.4.5 | Total Base Number
(ASTM D 2896) | 10.0 mg KOH/g min |
| 3.4.6 | Ball Rust Test
(ASTM D6557):Average Gray Value | 100 min |
| 3.4.7 | Biodiesel Oxidation Test:
Av. of three tests, Daimler Oxidation
(DIN 51 453) | 25 A/cm max |
| 3.4.8 | Aged Oil Low Temperature Viscosity,
ROBOT Test (ASTM D7528) or Seq IIIGA (ASTM D7320),
@ -30°C or -35°C (see note below) | 60,000 mPa.max |

Measure CCS viscosity of the EOT sample at the CCS temperature corresponding to original viscosity grade.

- a) If CCS viscosity measured is less than or equal to the maximum CCS viscosity specified for the original viscosity grade, run ASTM D4684 (MRV TP-1) at the MRV temperature specified in SAE J300 for the original viscosity grade.
- b) If CCS viscosity measured is higher than the maximum viscosity specified for the original viscosity grade in J300, run ASTM D4684 (MRV TP-1) at 5°C higher temperature (i.e., at MRV temperature specified in SAE J300 for the next higher viscosity grade).
- c) The EOT sample must show no yield stress in the D4684 test and its D4684 viscosity must be below the maximum specified in SAE J300 for the original viscosity grade or the next higher viscosity grade, depending on the CCS viscosity, as outlined in a) or b) above.

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| 3.4.9 | Physical Appearance and Odor
Shall be clear and bright with no objectionable odor. | |
| 3.4.10 | Contaminants
Shall be free of carcinogens, toxins, metals not removed in refining or from previous use. | |

3.5 "READ ACROSS" GUIDELINES



All performance tests must be conducted on the final oil formulations for consideration for initial fill. Exceptions may be permitted with supporting supplementary data on similar formulations to allow for approval in the absence of complete testing.

3.6 QUALIFICATION PROCEDURE

3.6.1 Documentation

Supplier must furnish to the affected Materials Engineering activity a completed and certified copy of the attached Supplement A, test reports demonstrating full compliance with all the requirements of this specification and a copy of the final American Chemistry Council (ACC – formerly CMA) and ERC summaries if available. The need for ACC and ATIEL registration of tests will be determined by the affected Materials Engineering activity. The copy of the ACC and ERC summaries should be sent directly from Registration Systems Inc. and ERC to the Materials Engineering activity unless specifically instructed by that activity.

The test reports must include results on both the candidate oil and the appropriate reference oils. The standard photographs of the test components are considered an essential part of the required test documentation. The oil sample code used for identification in each test document must be consistent. Any deviation in sample code uniformity must be explained and shown on the cover of each test report.

All tests must be certified by a qualified and authorized representative of the test facility.

The supplier shall identify all the formulation changes and modifications that occurred in the test program that coincide with the tests listed in the ACC and ERC Summaries. Individual formulations should be listed in Supplement A, and for registered tests, identified by the line item number and the formulation code.

3.6.2 Verification

The affected Materials Engineering activity reserves the right to conduct verification testing. If the test results do not support the originally submitted data, the supplier must re-test the product in coordination with the affected Materials Engineering activity. This re-test must be conducted and certified by a mutually agreed upon test facility.

3.6.3 Chemical and Physical Properties

Supplier shall furnish appropriate chemical and physical properties as required on Supplement A along with the manufacturing limits that apply to the material upon which approval is requested.

3.6.4 Performance Requirements

Conformance to the engine test requirements listed in Supplement A will be determined by using Multiple Test Acceptance Criteria (MTAC), where applicable. All data and reports from the tests used for MTAC must be provided by the supplier. On Supplement A identify the engine tests that have been used to determine the MTAC results by the corresponding line item number on the ACC Summary. The affected Materials Engineering activity reserves the right to use all tests when averaging in place of MTAC.

3.6.5 Quality Control

Upon engineering approval, supplier and affected Materials Engineering activity shall establish mutually agreed upon quality control limits, to be listed on Supplement B, and will be used for ongoing product verifications at mutually agreed upon frequencies. The infrared absorption spectra of the approved material shall constitute the reference standard.



and shall be kept on file. All samples shall produce infrared spectra that correspond to the reference standard when tested under the same conditions as those specified on the master spectra.

3.7 FLEET TESTING

Materials which, in the opinion of the affected Materials Engineering activity, constitute a significant departure from conventional formulations, whether in base stocks, refining processes or additive packages, must be fleet tested, in addition to the requirements outlined herein. These tests must include the type(s) of service judged to be affected by the difference in formulation technology. The affected Materials Engineering activity should be consulted prior to testing.