



## Test Monitoring Center

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D4485 Information Letter 20-5  
Sequence Number 12  
June 9, 2020

*ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.*

TO: D4485 Mailing List

SUBJECT: Update API Category CJ-4 Requirements

On May 28, 2020, the D4485 Surveillance Panel approved updates to the API Category CJ-4 requirements in ASTM Specification D4485, to bring it in line with the most recent edition of API 1509.

The text of the revisions is shown in the attachment. These changes are effective with the issuance of this information letter.

Joe Franklin  
Chairman  
ASTM Subcommittee B

Frank M. Farber  
Director  
ASTM Test Monitoring Center

Attachment

c: [http://www.astmtmc.cmu.edu/ftp/docs/d4485/IL\\_20-5\\_D4485.pdf](http://www.astmtmc.cmu.edu/ftp/docs/d4485/IL_20-5_D4485.pdf)

Distribution: Email

## Revises D4485-19

[All changes are **highlighted in yellow.**]

### TABLE 4 Diesel Engine Oil Category CJ-4

Required Test Method	Engine Test Method	Rated or Measured Parameter	Primary Performance Criteria			
			One-test	Two-test	Three-test	
T-12 (D7422)	D7422	Merit rating, <sup>A</sup> min	1000	1000	1000	
ISM (D7468)	D7468	Merit rating, <sup>A</sup> min	1000	1000	1000	
		Top ring mass loss, mg, max	100	100	100	
C13 (D7549)	D7549	Merit rating, <sup>A</sup> min	1000	1000	1000	
		Hot-stuck piston ring	none	none	none	
T-11 (D7156)	D7156	TGA % Soot at 4.0 mm <sup>2</sup> /s increase, at 100 °C, min	3.5	3.4	3.3	
		TGA % Soot at 12.0 mm <sup>2</sup> /s increase, at 100 °C, min	6.0	5.9	5.9	
		TGA % Soot at 15.0 mm <sup>2</sup> /s increase, at 100 °C, min	6.7	6.6	6.5	
ISB (D7484)	D7484	Slider tappet mass loss, mg, average, max	100	108	112	
		Cam lobe wear, μm, average, max	55	59	61	
		Crosshead mass loss, mg, average	report	report	report	
1N (D6750)	D6750	Weighted demerits (WDN), max	286.2	311.7	323.0	
		Top groove fill (TGF), %, max	20	23	25	
		Top land heavy carbon (TLHC), %, max	3	4	5	
		Oil consumption	g/kWh, (0 h – 252 h), max	0.54	0.54	0.54
			g/MJ (0 h – 252 h), max	0.15	0.15	0.15
		Piston, ring, and liner scuffing	none	none	none	
Piston ring sticking	none	none	none			
RFWT (D5966)	D5966	Average pin wear,	mils, max	0.30	0.33	0.36
			μm, max	(7.6)	(8.4)	(9.1)
Sequence IIIF (D6984)	D6984	Kinematic viscosity (at 40 °C), % increase, max	275	275 (MTAC)	275 (MTAC)	
or Sequence IIIG (D7320) <sup>B</sup>	D7320	Kinematic viscosity (at 40 °C), % increase, max	150	150 (MTAC)	150 (MTAC)	
or Sequence IIH (D8111)	D8111	60 – 80 h <sup>C</sup> Kinematic viscosity, % increase at 40 °C max	370	370 (MTAC)	370 (MTAC)	
or Sequence IIH70 (D8111 using Appendix X5)	D8111 (Using IIH70 Appendix X5 guideline)	70 h Kinematic viscosity, % increase at 40 °C max	181	181 (MTAC)	181 (MTAC)	
EOAT (D6894)	D6894	Aeration, volume, %, max	8.0	8.0 (MTAC)	8.0 (MTAC)	

**TABLE 4 Diesel Engine Oil Category CJ-4 (cont.)**

Bench Test Methods	Measured Parameter	Primary Performance Criteria	
D4683 (High temperature/High shear) or D4171 or D5481	Viscosity at 150 °C, mPa-s, min	3.5	
HTCBT, 135 °C (D6594)	Used Oil Elemental Concentration		
	Copper, mg/kg increase, max	20	
	Lead, mg/kg increase, max	120	
	Copper strip rating, <sup>D</sup> max	3	
D7109	Kinematic viscosity after 90 pass shearing, mm <sup>2</sup> /s at 100 °C, min	SAE XW-30	SAE XW-40
		9.3	12.5
Noack (D5800)	Evaporative loss at 250 °C, %, max	SAE < > 10W-30	SAE 10W-30
		13	15
Foam (D892)	Foaming/settling, <sup>E</sup> mL, max		
	Sequence I	10/0	
	Sequence II	20/0	
	Sequence III	10/0	
MRV TP-1 (D6896)	Viscosity of the 180 h used oil drain sample from a T-11 test, tested at -20 °C, mPa-s, max	25 000	
	If yield stress is detected, use the modified test method (external preheat), then measure the viscosity, mPa-s, max	25 000	
	Measure the yield stress, Pa	<35	

Chemical Limits (non-critical)				
Bench Test Methods	Measured Parameter		Primary Performance Criteria	
D874	Mass fraction sulfated ash, %, max		1.0	
D4951	Mass fraction phosphorus, %, max		0.12	
	Mass fraction sulfur, %, max		0.4	
<b>D7216 (Elastomer Compatibility)</b>				
Note—These are the <i>unadjusted specification limits</i> for elastomer compatibility. Candidate oils shall, however, conform to the <i>adjusted specification limits</i> , the calculation of which is described in <b>Annex A4</b> .				
Elastomer	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation at Break Change, %
Nitrile (NBR)	(+5, -3)	(+7, -5)	(+10, -TMC 1006)	(+10, -TMC 1006)
Silicone (VMQ)	(+TMC 1006, -3)	(+5, -TMC 1006)	(+10, -45)	(+20, -30)
Polyacrylate (ACM)	(+5, -3)	(+8, -5)	(+18, -15)	(+10, -35)
Fluoroelastomer (FKM)	(+5, -2)	(+7, -5)	(+10, -TMC 1006)	(+10, -TMC 1006)
Vamac G	(+TMC 1006, -3)	(+5, -TMC 1006)	(+10, -TMC 1006)	(+10, -TMC 1006)
Note—TMC 1006 is the designation for the reference oil used in this test method. This designation represents the original blend or subsequent approved re-blends of TMC 1006.				

[Table 4 Footnotes]

<sup>A</sup> See Annex A5 for additional information.

<sup>B</sup> The Sequence IIIG limits shown are more restrictive than the corresponding limits in Sequence IIIF, and are not intended to indicate equivalence. Results meeting the Sequence IIIG criteria stated can be used in lieu of Sequence IIIF.

<sup>C</sup> 60 - 80 h value is interpolated according to the equation  $PVIS@(60 - 80)h = \left( \frac{\sqrt{PVIS@60h} + \sqrt{PVIS@80h}}{2} \right)^2$ , where PVIS@60 h is percent viscosity increase at 60 h and PVIS@80 h is percent viscosity increase at 80 h.

<sup>D</sup> The rating system in Test Method D130 is used to rate the copper coupon in Test Method D6594.

<sup>E</sup> Ten minutes for Sequence I, II, and III.