

D 7216 – Engine Oil Elastomer Compatibility (Annex A1 – Heavy-Duty Elastomers)

Form 1 – Validity Declaration

Version:

YYYYMMDD

Conducted For:

CC

CC

C	V = Valid
	I = Invalid

Elastomer Type	Bath Number	Elastomer Batch	Oil Code	TESTKEY CMIR	SOT Date	SOT Time	EOT Date	EOT Time
Nitrile (NBR)	CCCCCCCC	CCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CCCCCC	YYYYMMD	HH:MM	YYYYMMDD	HH:MM
Polyacrylate (ACM)	CCCCCCCC	CCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CCCCCC	YYYYMMD	HH:MM	YYYYMMDD	HH:MM
Fluoroelastomer (FKM)	CCCCCCCC	CCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CCCCCC	YYYYMMD	HH:MM	YYYYMMDD	HH:MM
Silicone (VMQ-1)	CCCCCCCC	CCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CCCCCC	YYYYMMD	HH:MM	YYYYMMDD	HH:MM
Ethylene Acrylate (AEM)	CCCCCCCC	CCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CCCCCC	YYYYMMD	HH:MM	YYYYMMDD	HH:MM
Hydrogenated Nitrile (HNBR)	CCCCCCCC	CCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CCCCCC	YYYYMMD	HH:MM	YYYYMMDD	HH:MM

Alternative Codes:	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
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In my opinion this test CCCCCCCC been conducted in accordance with Test Method ASTM D 7216, Annex A2, and the appropriate amendments through the Information Letter System. The remarks on **Form 8** describe any anomalies associated with this test.

Submitted by: _____
Testing Laboratory

Signature

Typed Name

Title

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Form 2 – Candidate Data

Sample Code:	Test Method Version:	Lab:	SOT Date:	EOT Date:
CCCCCCCCCCCCCCC	CCCCCCCCCCC	CC	CCCCCCCC YYMMDD	S1234

Elastomer Identification	TMC Identification	Parameter	Reference Result	Candidate Acceptance Limits			Candidate Result
				Updated on:	YYMMDD		
Type: NITRILE (NBR)	Industry Oil: CCCCCCCCCCC	VOLUME CHANGE	S12.12	S12.12	to	S12.12	S12.12
		HARDNESS	S12	S12	to	S12	S12
Batch: CCCCCCC	CMIR (TESTKEY): CCCCC	TENSILE STRENGTH	S123.1	S123.1	to	S123.1	S123.1
		ELONGATION	S123.1	S123.1	to	S123.1	S123.1
Elastomer Identification	TMC Identification	Parameter	Reference Result	Candidate Acceptance Limits			Candidate Result
				Updated on:	YYMMDD		
Type: POLYACRYLATE (ACM)	Industry Oil: CCCCCCCCCCC	VOLUME CHANGE	S12.12	S12.12	to	S12.12	S12.12
		HARDNESS	S12	S12	to	S12	S12
Batch: CCCCCCC	CMIR (TESTKEY): CCCCC	TENSILE STRENGTH	S123.1	S123.1	to	S123.1	S123.1
		ELONGATION	S123.1	S123.1	to	S123.1	S123.1
Elastomer Identification	TMC Identification	Parameter	Reference Result	Candidate Acceptance Limits			Candidate Result
				Updated on:	YYMMDD		
Type: FLUOROELASTOMER (FKM)	Industry Oil: CCCCCCCCCCC	VOLUME CHANGE	S12.12	S12.12	to	S12.12	S12.12
		HARDNESS	S12	S12	to	S12	S12
Batch: CCCCCCC	CMIR (TESTKEY): CCCCC	TENSILE STRENGTH	S123.1	S123.1	to	S123.1	S123.1
		ELONGATION	S123.1	S123.1	to	S123.1	S123.1

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Form 3 – Candidate Data (continued)

Sample Code:	Test Method	Lab:	SOT Date:	EOT Date:	Test Length:
CCCCCCCCCCCCCCCC	Version: CCCCCCCCCCCC	CC	CCCCCCCC	YYYYMMDD	S1234

Elastomer Identification	TMC Identification	Parameter	Specification Limit	Acceptance Limits		Reference Result	Candidate Result
				Updated on:	YYYYMMDD		
Type: ETHYLENE ACRYLATE (MAC)	Industry Oil: CCCCCCCCCCCC	VOLUME CHANGE	+SL107 to -3%	S12.12	to S12.12	S12.12	S12.12
		HARDNESS	+5 pts to -SL107	S12	to S12	S12	S12
Batch: CCCCCCCC	CMIR (TESTKEY): CCCCCCCC	TENSILE STRENGTH	+10% to -SL107	S123.1	to S123.1	S123.1	S123.1
		ELONGATION	+10% to -SL107	S123.1	to S123.1	S123.1	S123.1
Elastomer Identification	TMC Identification	Parameter	Specification Limit	Acceptance Limits		Reference Result	Candidate Result
				Updated on:	YYYYMMDD		
Type: SILICONE (VMQ-1)	Industry Oil: CCCCCCCCCCCC	VOLUME CHANGE	+SL107 to -3%	S12.12	to S12.12	S12.12	S12.12
		HARDNESS	+5 pts to -SL107	S12	to S12	S12	S12
Batch: CCCCCCCC	CMIR (TESTKEY): CCCCCCCC	TENSILE STRENGTH	+10% to -45%	S123.1	to S123.1	S123.1	S123.1
		ELONGATION	+20% to -30%	S123.1	to S123.1	S123.1	S123.1
Elastomer Identification	TMC Identification	Parameter	Specification Limit	Acceptance Limits		Reference Result	Candidate Result
				Updated on:	YYYYMMDD		
Type: HYDROGENATED NITRILE (HNBR)	Industry Oil: CCCCCCCCCCCC	VOLUME CHANGE	+TBD% to -TBD%	S12.12	to S12.12	S12.12	S12.12
		HARDNESS	+TBD pts to -TBD pts	S12	to S12	S12	S12
Batch: CCCCCCCC	CMIR (TESTKEY): CCCCCCCC	TENSILE STRENGTH	+TBD% to -TBD%	S123.1	to S123.1	S123.1	S123.1
		ELONGATION	+TBD% to -TBD%	S123.1	to S123.1	S123.1	S123.1

D 7216 – Engine Oil Elastomer Compatibility (Annex A1 – Heavy-Duty Elastomers)
Form 4 – Results Summary – Candidate (Non-Reference Oil)

Sample Code:	Lab Oil Code:	Lab:
CCCCCCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CC

Elastomer Type: CCCCCCCCCCCCCC			Elastomer Batch Code: CCCCCC		
			Bath Number: CCCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCC			Elastomer Batch Code: CCCCCC		
			Bath Number: CCCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCC			Elastomer Batch Code: CCCCCC		
			Bath Number: CCCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

D 7216 – Engine Oil Elastomer Compatibility (Annex A1 – Heavy-Duty Elastomers)
Form 5 – Results Summary – Candidate (Non-Reference Oil)

Sample Code:	Lab Oil Code:	Lab:
CCCCCCCCCCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCCCCCC	CC

Elastomer Type: CCCCCCCCCCCCCCCCCC			Elastomer Batch Code: CCCCCC		
			Bath Number: CCCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCCCCCC			Elastomer Batch Code: CCCCCC		
			Bath Number: CCCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCCCCCC			Elastomer Batch Code: CCCCCC		
			Bath Number: CCCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

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Form 6 – Results Summary – Reference Oil

Lab Oil Code:	Lab:
CCCCCCCCCCCCCCCCCCCC	CC

Elastomer Type: CCCCCCCCCCCCCCCCCC			TMC Industry Oil Code: CCCCCCCCCCCCCC		
CMIR (TESTKEY): CCCCCC			Batch Code: CCCCCC		
Bath Number: CCCCCCCC			Bath Type: CCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCCCCCC			TMC Industry Oil Code: CCCCCCCCCCCCCC		
CMIR (TESTKEY): CCCCCC			Batch Code: CCCCCC		
Bath Number: CCCCCCCC			Bath Type: CCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCCCCCC			TMC Industry Oil Code: CCCCCCCCCCCCCC		
CMIR (TESTKEY): CCCCCC			Batch Code: CCCCCC		
Bath Number: CCCCCCCC			Bath Type: CCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

D 7216 – Engine Oil Elastomer Compatibility (Annex A1 – Heavy-Duty Elastomers)
Form 7 – Results Summary – Reference Oil

Lab Oil Code:	Lab:
CCCCCCCCCCCCCCCCCCCC	CC

Elastomer Type: CCCCCCCCCCCCCCCCCC			TMC Industry Oil Code: CCCCCCCCCCCCCC		
CMIR (TESTKEY): CCCCCC			Batch Code: CCCCCC		
Bath Number: CCCCCCCC			Bath Type: CCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCCCCCC			TMC Industry Oil Code: CCCCCCCCCCCCCC		
CMIR (TESTKEY): CCCCCC			Batch Code: CCCCCC		
Bath Number: CCCCCCCC			Bath Type: CCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S123.1	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

Elastomer Type: CCCCCCCCCCCCCCCCCC			TMC Industry Oil Code: CCCCCCCCCCCCCC		
CMIR (TESTKEY): CCCCCC			Batch Code: CCCCCC		
Bath Number: CCCCCCCC			Bath Type: CCCCC		
Test Temperature, °C	Test Duration, Hours	Volume Change, %	Hardness Change, Points	Tensile Strength Change, %	Elongation Change, %
S123	S1234	S123.12	S123456	S1234.1	S1234.1
Start of Test, Date / Time	End of Test, Date / Time	S123.12	S123456	S1234.1	S1234.1
		S123.12	S123456	S1234.1	S1234.1
HH:MM	HH:MM	S123.12	S123456	S1234.1	S1234.1
YYYYMMDD	YYYYMMDD	S123.12	S123456	S1234.1	S1234.1
VOL, HARD, TENSTR, ELON Change		S123.12	S123456	S1234.1	S1234.1
Average		S12.12	S12	S123.1	S123.1
Correction Factor		S12.12	S12	S123.1	S123.1
Corrected Average		S12.12	S12	S123.1	S123.1
Standard Deviation		S12.12	S12.12	S12.12	S12.12

D 7216 – Engine Oil Elastomer Compatibility (Annex A1 – Heavy-Duty Elastomers)
Form 8 – Comments

Sample Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCC	Lab:	CC	EOT Date:	YYYYMMDD
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D 7216 – Engine Oil Elastomer Compatibility (Annex A1 – Heavy-Duty Elastomers)
Form 9 – TMC Date and Acceptance Limits

Elastomer	Ethylene Acrylate	Fluoroelastomer	Nitrile Butyl Rubber
TMC Date	YYYYMMDD	YYYYMMDD	YYYYMMDD
Volume (Limit 1)	S12.12	S12.12	S12.12
Volume (Limit 2)	S12.12	S12.12	S12.12
Hardness (Limit 1)	S12	S12	S12
Hardness (Limit 2)	S12	S12	S12
Tensile Strength (Limit 1)	S123.1	S123.1	S123.1
Tensile Strength (Limit 2)	S123.1	S123.1	S123.1
Elongation (Limit 1)	S123.1	S123.1	S123.1
Elongation (Limit 2)	S123.1	S123.1	S123.1

Elastomer	Silicone	Polyacrylate	Hydrogenated Nitrile BR
TMC Date	YYYYMMDD	YYYYMMDD	YYYYMMDD
Volume (Limit 1)	S12.12	S12.12	S12.12
Volume (Limit 2)	S12.12	S12.12	S12.12
Hardness (Limit 1)	S12	S12	S12
Hardness (Limit 2)	S12	S12	S12
Tensile Strength (Limit 1)	S123.1	S123.1	S123.1
Tensile Strength (Limit 2)	S123.1	S123.1	S123.1
Elongation (Limit 1)	S123.1	S123.1	S123.1
Elongation (Limit 2)	S123.1	S123.1	S123.1