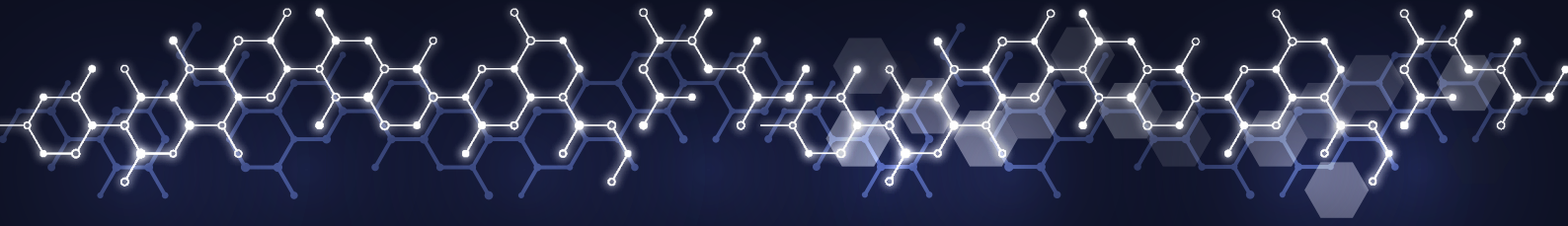




HDEO Cascade

LT9812



■ OEM performances

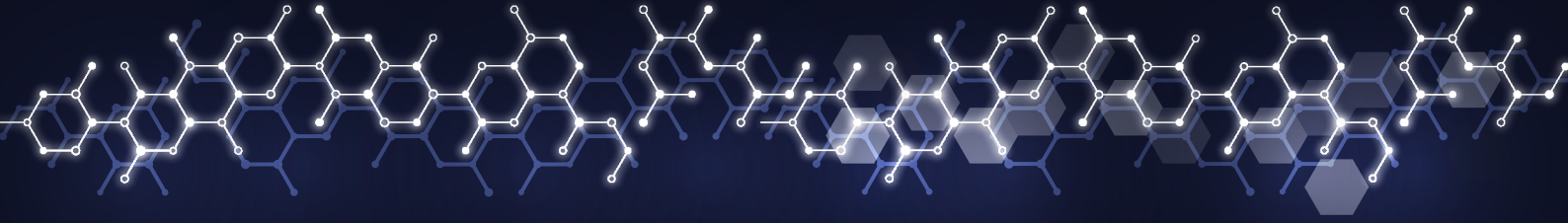
- MB 228.3 is available in Group I and Group II
 - Oxidation tests are passing in full mineral if Saturate are $> 75\%$ (safe zone)
- MAN 3275 and MI®29.1 specification are now obsolete
- MB 229.1 trading available in some base oils.

■ New performances

- 10W-40 & 15W-40 with Lubritec using Group II
- New grade coverage to 10W-30 and 20W-50 within Base Oil Matrix.
- Comprehensive PCMO performance on Lubritec @ : 9.33%

LUBRITEC - API CI-4 / ACEA E7-16

Performance Claims Overview



**Lubritec @ 9.33wt%
(8.4 BN)**

**SAE 15W-40
(GP I & GP II)**

**HDEO
API CG-4**

MB 228.3
MTU Type 2
MAN M3275-1 level

POMO

API SL with Anti Oxidant
ACEA A3/B3/B4 (Grp /I)
MB229.1

**Lubritec @ 10.2wt%
(10.1 BN)**

**SAE 15W-40, 20W-50
(GP I & GP II)**

**HDEO
ACEA E7-16
API CI-4 and CH-4**

GLOBAL DHD-1
MB 228.3
MTU Type 2
MAN M3275-1
VOLVO VDS-3
RENAULT TRUCKS RLD-2
MACK EO-N/EO-M Plus
CUMMINS CES 20078
DETROIT DIESEL DDC 93K215
CATERPILAR ECF-1a
DEUTZ DQC III-10

JASO DH-1 Level
Allison C4 Level

POMO

API SL
MB 229.1
ACEA A3/B3/B4-16

**Lubritec @ 11.2wt%
(10.1 BN)**

**SAE 10W-40, 10W-30
(EHC GP II, Chevron GP II)**

**HDEO
ACEA E7-16
API CI-4 and CH-4**

GLOBAL DHD-1
MB 228.3
MTU Type 2
MAN M3275-1
VOLVO VDS-3
RENAULT TRUCKS RLD-2
MACK EO-N/EO-M Plus
CUMMINS CES 20078
DETROIT DIESEL DDC 93K215
DEUTZ DQC II-1

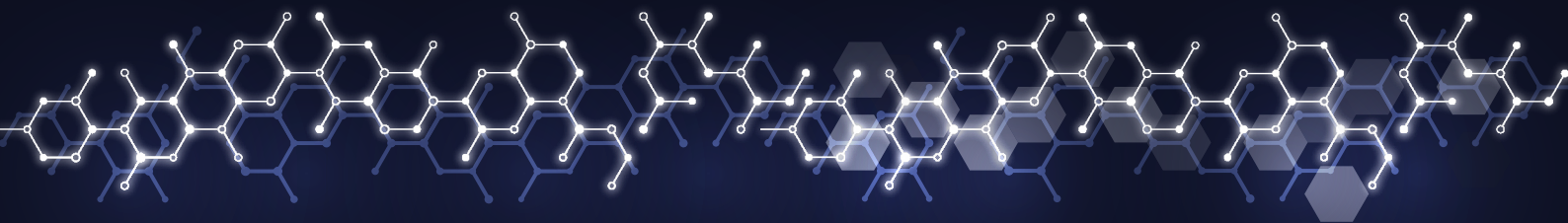
JASO DH-1 Level
Allison C4 Level

POMO

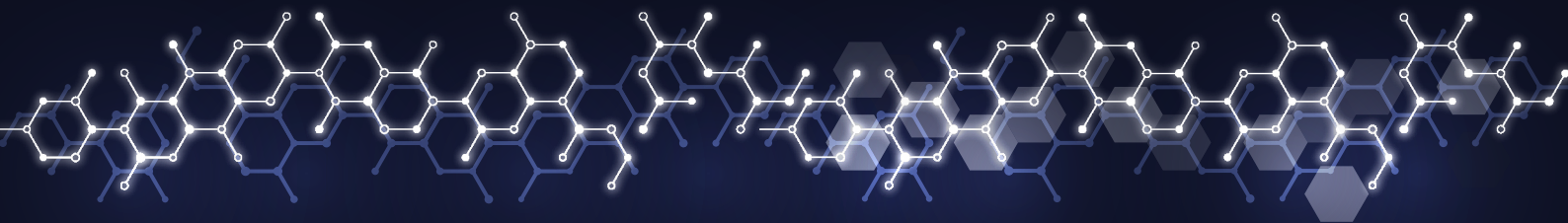
MB 229.1
ACEA A3/B3/B4-16

A VERSATILE & COMPLETE HDEO CASCADE

Logistic Options



	Lubritec
API CI-4 MB 228.3 ACEA A3/B4 Full OEM Profile Cat ECF-2 / Cat ECF1a	Lubritec @ 11.2wt% + Lubritec @ 1.7wt% 15W-40 / 10W-40 20W-50 / 10W-30
API CI-4 MB 228.3 ACEA A3/B4 OEM	Lubritec @ 10.2wt% 15W-40/ 20W-50 grp / II 10W-40 / 10W-30 (EHC GpII)
API CI-4 MB 228.3	Lubritec @ 9.33wt% 15W-40 / 20W-50 Chevron / XOM EHC Final Formulation in progress
API CH-4 / CG-4 MB 228.3 + OEM Claims	Lubritec @ 9.33wt% 15W-40 / 20W-50 Grp II - CH-4 (in progress) Grp I - CG-4
API CF-4 MB 228.1 MAN 270	Lubritec @ 8,2wt% 15W-40
API CF/ CF-4	Lubritec @ 7,0wt% 15W-40



OR-F Base Oil System	62616D-A CVX	705880-A CVX	56515D-I XOM AP/E	67741D-A XOM EHC	67742D-A XOM EHC	705840-A XOM EHC
Grade	15W-40	20W-50	15W-40	15W-40	15W-40	20W-50
LUBRITEC	11.20%	11.20%	11.20%	11.20%	11.20%	11.20%
Dutral OCP 2550	8.10%	6.30%	8.10%	8.50%	8.20%	5.70%
Lubritec LT7050	0.50%	0.30%	0.30%	0.30%	0.30%	0.30%
Group I base oil	70.20%	13.20%				
Group II base oil	10.00%	69%				
XOM EHC50 (group II)				54%	54%	
XOM EHC110 (group I)				26%		82.8%
XOM EHC120 (group II)					26%	
XOM AP/E 150N (group I)			60.30%			
XOM ARE 600N (group I)			20.10%			
P&C's						
VK 100°C	14.8	18.70	14	14.5	14.4	18.2
CCS	5470	6546	6310	4647	4879	8654
S.Ash	1.4	1.5	1.4	1.5	1.5	
TBN	12	12	12	12	12	

Performances						
Claims	API CI-4/SL ACEA E7-16	API CI-4/ SL Level ACEA E7-16	API CI-4/SL ACEA E7-16	API CI-4/SL ACEA E7-16	API CI-4/SL ACEA E7-16	API CI-4/ SL Level ACEA E7-16
	MB 228.3	ACEA E7-16	MB 228.3	MB 228.3	MB 228.3	ACEA E7-16
	JASO DH-1-15	MB 228.3	JASO DH-1-15	JASO DH-1-15	JASO DH-1-15	MB 228.3
	GLOBAL DHD-1	JASO DH-1-15	GLOBAL DHD-1	GLOBAL DHD-1	GLOBAL DHD-1	JASO DH-1-15
	MTU Type2	GLOBAL DHD-1	MTU Type2	MTU Type2	MTU Type2	GLOBAL DHD-1
	VOLVO VDS-3	MTU Type2	VOLVO VDS-3	VOLVO VDS-3	VOLVO VDS-3	MTU Type2
	RENAULT RLD-2		RENAULT RLD-2	RENAULT RLD-2	RENAULT RLD-2	
	MACK EO-N		MACK EO-N	MACK EO-N	MACK EO-N	
	CUMMINS CES 20078		CUMMINS CES 20078	CUMMINS CES 20078	CUMMINS CES 20078	
Levels	Detroit Diesel	Detroit Diesel	Detroit Diesel	Detroit Diesel	Detroit Diesel	Detroit Diesel
	DDC93K215	DDC93K215	DDC93K215	DDC93K215	DDC93K215	DDC93K215
	DEUTZ DQC III-10	DEUTZ DQC III-10	DEUTZ DQC III-10	DEUTZ DQC III-10	DEUTZ DQC III-10	DEUTZ DQC III-10
	Caterpillar		IVECO	Caterpillar	Caterpillar	
	ECF-1a		MAN M3275-1	ECF-1a	ECF-1a	
	IVECO			IVECO	IVECO	
	MAN M3275-1			MAN M3275-1	MAN M3275-1	

LUBRITEC - STM/BOI

Claims possible in Group I and Group II base stocks



11.2wt% (BN 10.5)

**SAE 15W-40 (GPI & GP II)
SAE 10W-40*, 10W-30*,
20W-50 (GP II, III)**

HDEO

API CI-4

API SL/CF

ACEA E7-16

JASO DH-1

GLOBAL DHD-1

MB 228.3

MAN M3275-1 (obsolete)

MTU Type 2

VOLVO VDS-3

RENAULT TRUCKS RLD-2

MACK EO-N

CUMMINS CES 20076/77/78

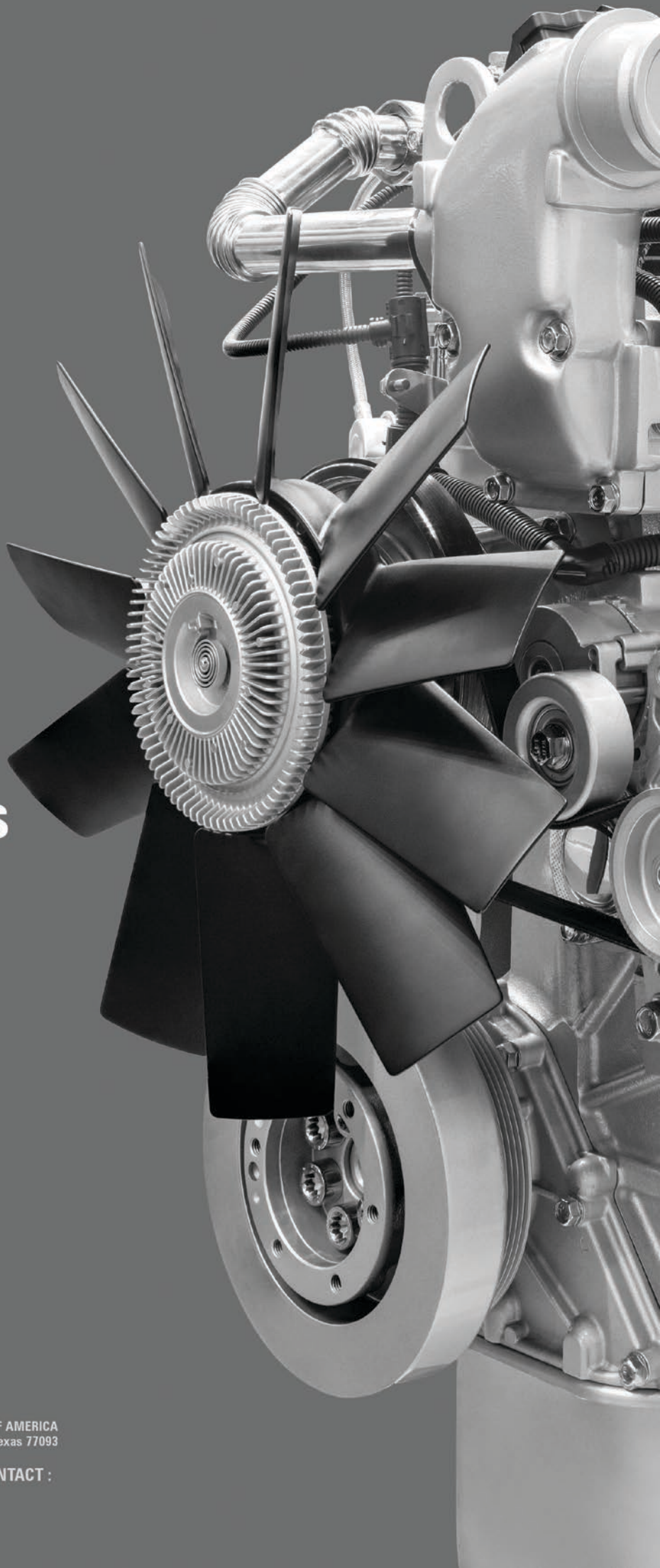
DEUTZ DQC III-10

CATERPILLAR ECF 1a.

The HDEO Claims shown here
are possible in a broad range
of GP Land SP UI base stocks
thanks to the
STM/BOI matrix completed
with lubritec

*10W-40 and 10W-30 may require formulation adjustment such as alternate Group III content;
this may then requires additional engine tests

**Our Additives
Makes Engines
Runs Forever**



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