



11th January 2017

High Industrial Lubricants & Liquids Corporation (HILL)

25/5, «Novy Mir» VIP-Town, Samal-3,
A25D0B6 (050059), Almaty
Kazakhstan

Reference: FASTROIL Universal Transmission Oil SAE 10W, 30, 50

Dear Dr. Kutsev,

HiTEC[®] 8888F is suitable for use against Caterpillar TO-4, Allison C4 and Komatsu KES 07.868.1 specifications based on technical data which is recorded in our technical report.

Formulations with HiTEC[®] at % in Hill base oils, Fastroil Universal Transmission Oil SAE 10W, 30, 50 are attached – complete with data which shows suitability for use against Caterpillar TO-4, Allison C4 and Komatsu KES 07.868.1 specifications.

Yours sincerely,

Rachel McNicoll
Customer Technical Service Technologist

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		Fastroil Universal Transmission Oil			
		SAE	10W	30	50
		<i>Fluid Code</i>	<i>TOB-1291-H</i>	<i>TOB-1291-B</i>	<i>TOB-1291-C</i>
CAT TO-4	Test Method	Limits			
KV100, mm ² /s	ASTM D445	Min: 10W(6cSt), 30 (10.6cSt), 50(17.5cSt)	6.37	12.51	18.4
Brookfield, cP	ASTM D2983	<150,000	(-35°C) 84882	(-25°C) 130000	(-15°C) 58288
MRV, cP	ASTM D4684	<30,000	(-25°C) 11600	(-15°C) 11300	(-10°C) 12200
HTHS, cP	ASTM D4683	Min: 10W(2.1), 30 (2.9), 50(4.5)	2.11	3.7	5.02
Foam Dry Sequence I Sequence II Sequence III	ASTM D892	25/0 50/0 25/0	0/0 10/0 0/0	20/0 10/0 0/0	0/0/0 0/0/0 0/0/0
Foam Wet (0.1% added water) Sequence I Sequence II Sequence III	ASTM D892	25/0 50/0 25/0	0/0 30/0 0/0	0/0 20/0 0/0	0/0/0 0/0/0 0/0/0
Flash, °C	ASTM D92 (COC)	>200 for 10W >220 for others	236	252	260
Fire, °C	ASTM D92 (COC)	>200 for 10W >220 for others	260	282	294
Pour Point, °C	ASTM D97	10W(-30°C), 30 (-15°C), 50 (- 12°C)	-30	-27	-18
Water, ppm	ASTM D6304	Must not exceed 0.1 volume percent	125	77	166

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Allison C4	Test Method	Limits			
KV100, mm ² /s	ASTM D445	Report	6.37	12.51	18.4
KV40, mm ² /s	ASTM D445	Report	40.5	116.1	209.7
Viscosity Index		Report	106	99	97
Flash, °C	ASTM D92 (COC)	>170°C	236	252	260
Fire, °C	ASTM D92 (COC)	>185°C	260	282	294
Pour Point, °C	ASTM D97	Report	-30	-27	-18
Elemental Analysis, mg/kg	BEM 201	Report			
AL			1	1	1
B			0	0	1
BA			1	1	1
CA			2523	2527	2569
CD			0	0	0
CR			0	0	0
CU			0	0	0
FE			2	2	2
MG			7	7	7
MN			0	0	0
MO			0	0	0
NA			15	15	3
NI			0	0	0
P			908	910	918
PB			3	2	4
SI			8	10	7
SN			4	5	3
TI			0	0	0
V			0	0	0
ZN			1094	1092	1053
S			2758	6441	11430
Chlorine, mg/kg	XRF	Report	<5	9	7
TAN, mgKOH/g	IP 177	Report	1.15	1.65	1.55
TBN, mgKOH/g	IP 276	Report	5.7	8.5	8.5

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Komatsu KES 07.828.1	Test Method	Limits			
KV100, mm ² /s	ASTM D445	10W(5.6), 30(11+/-2), 50(19+/-3)	6.37	12.51	18.4
KV40, mm ² /s	ASTM D445	10W(35+/-10), 30(100+/- 20), 50(205+/-35)	40.5	116.1	209.7
Viscosity Index		10W(min95), 30 and 50 (min90)	106	99	97
Density 15°C, g/ml	ASTM D1298	10W(0.86 to 0.91), 30 and 50(0.87-0.92)	0.87422	0.89007	0.89915
Flash, °C	ASTM D92 (COC)	10W(>200°C), 30(>220°C), 50(>230°C)	236	252	260
Pour Point, °C	ASTM D97	10W(<-25°C), 30(<-10°C), 50(<-7.5°C)	-30	-27	-18
TBN, mgKOH/g	IP 276		5.7	8.5	8.5
Silicone, ppm	BEM 201	Max 20 ppm	8	10	7
Copper, ppm	BEM 201	Max 10 ppm	0	0	0
Sodium, ppm	BEM 201	Max 25 ppm	15	15	3