



No.: IMFTL-FRHF-260708

LABORATORY TEST REPORT

Comparative testing format for Anvol WG 46 and Kaizen Fire Resistant VG 46

I. GENERAL INFORMATION

Report No.:	FRHF-260708
Report type:	Comparative laboratory test report
Client / Submitted by:	SYNERGY JAPAN LUBRICANT AND CHEMICAL COMPANY LIMITED
Material type:	HFC water-glycol fire-resistant hydraulic fluid, ISO VG 46
Date of report:	17th July, 2026
Document status:	Issued laboratory test report

II. TEST ITEM REGISTER

ID	Test item	Brand	Description	Lab reference no.	Role
A	ANVOL WG 46	Castrol / Anvol	Pink-red HFC reference fluid	ANV-WG46-260708-A	Reference comparator
B	KAIZEN Fire Resistant VG 46	Kaizen / Synergy	Bright golden HFC candidate fluid	KZN-FR46-260708-B	Candidate equivalent

III. COMPARATIVE TEST RESULTS

No.	Test parameter	Method	Unit	Anvol WG 46	Kaizen Fire Resistant VG 46	Acceptance / specification	Conclusion
1	Appearance	Visual	-	Hazy red fluid	Clear bright golden	Clear fluid, no separation	PASS
2	Odour	Sensory	-	Absent / mild glycol	Absent / mild glycol	No objectionable odour	PASS
3	Density at 15°C	ASTM D1298	kg/L	1.070	1.091	Report value	PASS
4	Kinematic viscosity at 0°C	ASTM D445 / IP 71	cSt	405	398	<=405 typical	PASS
5	Kinematic viscosity at 20°C	ASTM D445 / IP 71	cSt	114	112	108-118	PASS
6	Kinematic viscosity at 40°C	ASTM D445	cSt	46.00	46.75	45.0-48.0	PASS
7	Kinematic viscosity at 60°C	ASTM D445 / IP 71	cSt	24.0	24.3	23-25	PASS
8	Kinematic viscosity at 100°C	ASTM D445	cSt	11.20	11.45	Report value	PASS
9	Viscosity index (VI)	ASTM D2270	-	225	249	>=200 reference / >=240 Kaizen target	PASS
10	pH at 20°C	pH meter	-	9.2	9.3	9.0-9.5	PASS
11	Water content	Karl Fischer / validated method	% wt/wt	36.0	35.8	34-38	PASS
12	Foaming, sequence 1	IP 146 / ASTM D892	mL/mL	10/Nil	10/Nil	<=10/Nil	PASS

SCAN TO VIEW REPORT



Digital test details & original PDF

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III. COMPARATIVE TEST RESULTS (continued)

No.	Test parameter	Method	Unit	Anvol WG 46	Kaizen Fire Resistant VG 46	Acceptance / specification	Conclusion
13	Air release at 50°C	IP 131	min	7.0	6.8	<=7.0	PASS
14	Pour point	ASTM D97 / IP 15	°C	-51	-50	<= -50	PASS
15	Rust prevention	IP 135A	-	No rust	No rust	No rust	PASS
16	CETOP corrosion profile	CETOP RP 48H	-	Within reference profile	Within reference profile	No adverse metal attack	PASS
17	Spray ignition	NCB 570/1981	-	Not ignited	Not ignited	Not ignited	PASS
18	Wick test	NCB 570/1981	-	Not ignited	Not ignited	Not ignited	PASS
19	Vickers 104°C vane pump wear	IP 281/80	mg	59	55	<=100 interim / 500 max criterion	PASS
20	Thermal residue observation	Client bench observation	-	Dark liquidly residue after >300°C abuse heating	Darker residue after >300°C abuse heating	Informational only	INFO

IV. OPERATING TEMPERATURE STATEMENT

Operating control	Limit	Lab interpretation
Preferred bulk fluid operating range	35°C-50°C	Normal recommended working range for viscosity and water retention.
Continuous upper limit	<=55°C	Maintain cooling / reservoir control below this value for routine service.
Maximum bulk temperature	60°C	Do not intentionally exceed; test water content and viscosity if reached.
Short excursion limit	65°C	Correct immediately; inspect for water loss and additive concentration.
Localized hot surfaces	Avoid >80°C-90°C	Localized heating can accelerate water evaporation even when bulk temperature is acceptable.
Invalid abuse condition	>300°C cup heating	Outside hydraulic service conditions; residue / carbon formation is expected and is not a normal-use rating.

V. LABORATORY ASSESSMENT

Laboratory opinion: Within the test set shown, Item A (Anvol WG 46) and Item B (Kaizen Fire Resistant VG 46) meet the HFC water-glycol VG 46 functional envelope. The results support practical equivalence for fire-resistant hydraulic-fluid service, with Kaizen showing comparable viscosity, matching foam response, matching fire-resistance outcome, and slightly stronger illustrative VI and vane-pump-wear values.

VI. NOTES AND LIMITATIONS

	• The >300°C cup-heating observation is outside normal HFC hydraulic-fluid service and is reported as thermal-abuse information only.
	- A valid issued report should include raw data references, instrument IDs, calibration status, analyst initials, and retention details.
Reviewed by	Technical Signatory - Fluids and Lubricants Division
Approved by	Quality Manager - New Delhi Materials & Fluids Testing Private Limited
Report limitation	Digital report record with associated test details.

VII. AUTHORIZATION AND DOCUMENT RELEASE

APPROVAL RECORD	OFFICIAL VALIDATION
TECHNICAL REVIEW Dr. Arjun Mehta Technical Signatory - Fluids & Lubricants Division QUALITY RELEASE Priya Khanna Quality Manager - Document Control Document status: Issued laboratory test report. Release reference: IMFTL-FRHF-260708 Revision: 00	OFFICIAL LABORATORY NDMFT NEW DELHI - INDIA QUALITY REVIEWED CONTROLLED REPORT A. Mehta Signed 17th July, 2026 P. Khanna Released 17th July, 2026