

Introducing
HyJet V

The first Type V phosphate ester hydraulic fluid with highest-grade approvals from Airbus and Boeing.





HyJet V is the first Type V fluid authorized for use in the Airbus A380's 5000-psi hydraulic system.

HyJet V fire-resistant Type V hydraulic fluid offers wear and corrosion protection and long service life to meet demanding industry needs.

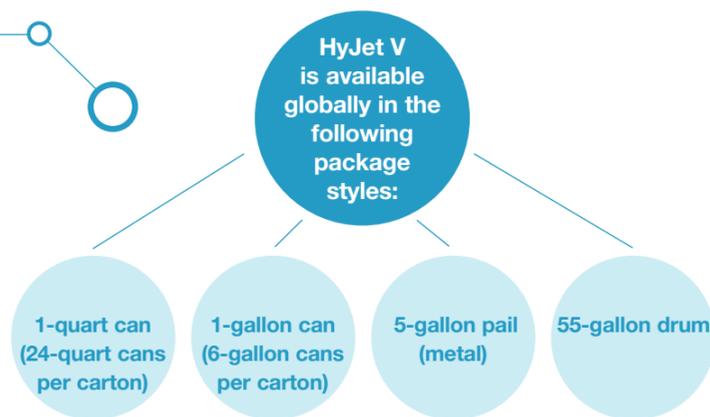
HyJet V from ExxonMobil is a new fire-resistant Type V phosphate ester hydraulic fluid. It is our response to the commercial aviation industry's request for a product with better thermal and hydrolytic stability, and longer service life than Type IV hydraulic fluids. Less prone to degradation, HyJet V can be replenished less frequently, potentially reducing maintenance and disposal costs.

HyJet V is fully compatible with all approved Type IV and Type V hydraulic fluids. It is also compatible with elastomers, cleaning solvents, paints and other hydraulic system materials.

Our product provides the advantages that you would expect from a global supplier with a long-standing reputation for leadership in aviation lubricant technology.

HyJet V offers:

- **better wear protection** than competitive Type IV and Type V hydraulic fluids,
- better stability and **longer service life** than Type IV hydraulic fluids, and
- **stronger corrosion control** than competitive Type IV and Type V hydraulic fluids.



If you are looking for a hydraulic fluid that offers mixed fleets the highest level of performance, convert your equipment to HyJet V.

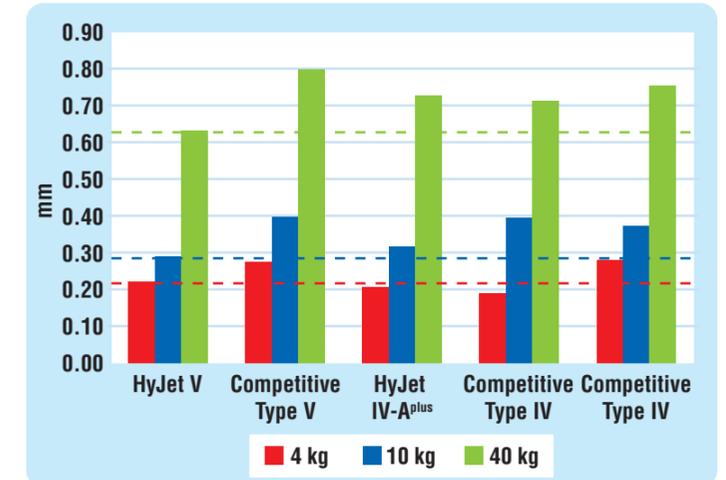
HyJet V performance will help ensure the reliability of your fleet's hydraulic systems.

Better Wear Protection

The Four Ball Wear Test (ASTM D 4172) determines the lubricity and wear protection properties of a lubricant. The test is used in Airbus and Boeing Phosphate Ester Aircraft Hydraulic Fluid Specifications. Three steel bearing balls are clamped together and covered with the test fluid, while a rotating fourth ball is pressed against them in sliding contact at various force levels. This contact produces a wear scar, which is measured and recorded. The smaller the average wear scar, the better the lubricant's wear protection.

Four Ball Wear Test

Wear Scar in mm after one hour at 600 rpm, 75°C, and force as shown



The Four Ball Wear Test (ASTM D 4172) produced generally smaller scars for HyJet V than for samples of other Type IV and Type V commercial products.* The difference in wear protection performance between HyJet V and the competitive Type V product was especially pronounced. Better performance in this test can mean better wear protection for a fleet's hydraulic system components.

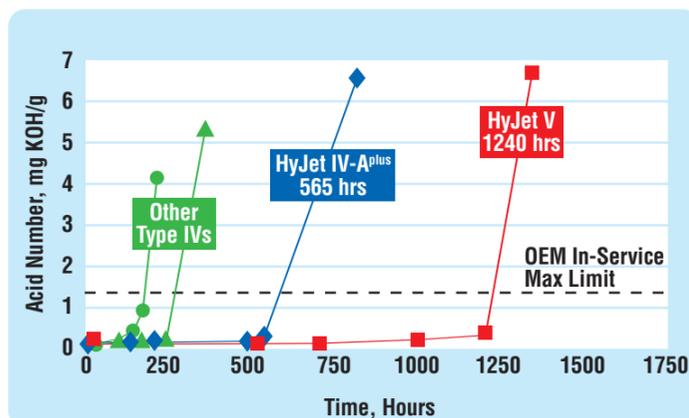
* Results are averages from testing samples from multiple batches of HyJet V and other commercial products.

Longer Service Life

Reaction with water at elevated temperatures is the dominant cause of degradation for phosphate ester hydraulic fluids. This is because the fluids rapidly absorb water from the atmosphere. The reaction produces acids, which can damage elastomers and etch metal surfaces. When a fluid's acid control additive is fully depleted, acid levels increase quickly and may harm hydraulic system components.

The Airbus NSA 307110 Ampoule Test (see chart to the right) confirmed that HyJet V offers better stability and longer service life than Type IV fluids.

Hydraulic Fluid Life Type IV vs. Type V
Ampoule Test @ 0.5% Water, 125°C



The Airbus NSA 307110 Ampoule Test measures a fluid's resistance to reaction with water (hydrolytic stability) and molecular breakdown at high temperatures (thermal stability). Fluid is tested at regular intervals to determine when it exceeds a 1.5 acid number, signifying the end of fluid life. Side-by-side testing confirmed that HyJet V offers better stability and longer service life than Type IV fluids.

Stronger Corrosion Control

While dissolved water in a phosphate ester hydraulic fluid does not cause rust, the separated water phase can cause rapid corrosion of ferrous parts.

Water in concentrations of approximately one percent is soluble in hydraulic fluid and not a cause for rust-related concerns. However, if the fluid does not have powerful rust inhibitors, water in concentrations of three percent or more can cause rapid and severe damage to the equipment. The photos (see right) confirm that HyJet V provides a measure of security against potentially damaging high-level water contamination that is better than competitive Type IV and Type V hydraulic fluids.

Rust Protection Comparison by ASTM D 665A



The ASTM D 665A test identifies rust on polished steel rods that have been exposed to 10 percent water in fluid for 24 hours at 60°C. HyJet V combats corrosion better than competitive Type IV and Type V hydraulic fluids.

HyJet V Specifications and Approvals

	Meets	In Qualified Products List
SAE Aerospace Standard AS1241, Type V	X	Not Applicable
Airbus NSA 307110M, Type V	X	X
Boeing BMS 3-11N Type V, Grade A	X	X
Boeing-Long Beach DMS 2014H Type 5	X	X
Bombardier BAMS 654-003NC, Type V	X	X
ATR NSA 307110M, Type V	X	X

Typical Properties

	Test Method	HyJet V ⁽¹⁾	Limits
Kinematic Viscosity, cSt	ASTM D 445		
at -53.9°C (-65°F)		1350	2000 max
at 37.8°C (100°F)		10.8	10.0 - 11.0
at 98.9°C (210°F)		3.7	3.35 - 3.75
Viscosity Index	ASTM D 2270	320	
Shear Stability, % Viscosity Drop at 40°C	ASTM D 5621	21	
Pour Point, °C (°F)	ASTM D 97	<-62 (-80)	-62 (-80) max
Specific Gravity at 25°C/25°C (77°F/77°F)	ASTM D 4052	0.997	0.993 - 1.005
Density at 15.6°C (60°F), g/mL (lb/gal)	ASTM D 4052	1.003 (8.37)	
Acid Number, mg KOH/g	ASTM D 974	0.05	0.1 max
Water, Karl Fischer, mass %	ASTM D 6304	0.1	0.2 max
Flammability			
Flash Point, °C (°F)	ASTM D 92	174 (346)	160 (320) min
Fire Point, °C (°F)	ASTM D 92	185 (365)	177 (350) min
Autoignition Point, °C (°F)	ASTM D 2155	>427 (800)	400 (752) min
Foaming Tendency/Stability, mL foam/sec to collapse	ASTM D 892		
Sequence I		10/10	250/100 max
Sequence II		10/10	150/50 max
Sequence III		10/10	450/250 max
Particle Count, NAS 1638 Class	Auto Counter	5	7 max
Chemical Elements, ppm			
Calcium		7	20 max
Potassium		38	48 max
Chlorine		8	50 max
Sodium		5	15 max
Sulfur		50	200 max
Electrical Conductivity at 20°C, microSiemens/cm		0.4	0.3 min
Bulk Modulus, Isothermal secant at 100°F/3000 psi, psi		210,000	
Thermal Conductivity at 40°C, cal/sec/cm ² /°C (Btu/hr/ft ² /°F)		33 x 10 ⁻⁵ (0.0799)	
Coefficient of Thermal Expansion, 25 to 100°C, per °C (per °F)		0.00086 (0.00048)	
Specific Heat Capacity at 40°C, cal/g/°C (same as Btu/lb/°F)		0.42	

⁽¹⁾ Values may vary within modest ranges



ExxonMobil continually invests in researching and developing new lubricant technology to ensure we meet the changing needs of our aviation customers.

Following good storage and handling practices will help to keep HyJet V and your fleet's hydraulic systems working reliably.

Following relatively simple storage and handling practices can make a significant difference in terms of safety, the quality of the lubricants you use, and the reliability of your fleet's hydraulic systems. By storing and handling HyJet V properly, you can help to ensure that it will not deteriorate as a result of contamination or exposure to extreme temperatures.

- Store HyJet V indoors.
- Minimize the time product containers are open to avoid contamination by dust or moisture from air.
- Keep dispensing equipment clean and dry. Cover equipment when not in use.

The shelf life of an unopened container of HyJet V is five years for drums and pails and 10 years for quarts and gallon cans, if it has been stored properly.

Based on available toxicological information, HyJet V is not expected to produce adverse effects on health when used and handled properly.

Your ExxonMobil Aviation Lubricants sales representative can provide you with additional detailed information on how to properly store and handle HyJet V.



The Material Safety Data Sheet (MSDS) for HyJet V shares information on use and handling, as well as health and safety information. You can find the MSDS online at www.exxonmobil.com/lubes.

To learn more about HyJet V, please contact your local ExxonMobil Aviation Lubricants representative, or visit www.exxonmobil.com/lubes/aviation.

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Printed in U.S.A.

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