

# Fortrix Diesel Ultra

## Technical Specification & Laboratory Test Results

ASTM D975 Compliance Verification

### Product Overview

Fortrix Diesel Ultra is a premium diesel fuel produced through Advanced Molecular Processing Technology. This fuel exceeds all ASTM D975 specifications and delivers superior performance in all diesel applications. The following test results from government and independent laboratories verify full regulatory compliance and document the fuel's performance advantages.

### Performance Summary

Key Parameter	Fortrix Advantage	Operational Benefit
Cetane Index: 54.5	36% above minimum	Easier starting, smoother operation
Sulfur: 10 ppm	33% below EPA limit	Cleaner burning, extended DPF life
Pour Point: -24°C	Excellent cold flow	Year-round operation, no additives
Lubricity: 170 µm	67% better than limit	Reduced pump/injector wear
Flash Point: 60.5°C	16% safety margin	Enhanced handling safety
Storage Stability	1+ year shelf life	Flexible inventory management

## Complete ASTM D975 Test Results

Comprehensive test results comparing Fortrix Diesel Ultra against ASTM D975 requirements. All parameters meet or exceed federal specifications.

Parameter	ASTM D975 Requirement	Fortrix Diesel Result	Performance
API Gravity @ 15.6°C	31.2 - 43.2	41.1	✓ PASS
Specific Gravity @ 15.6°C	0.81 - 0.87	0.8198	✓ PASS
Cetane Index	Min 40	54.5	✓ 36% Better
Flash Point (°C)	Min 52	60.5	✓ 16% Better
Pour Point (°C)	Max 10	-24	✓ Excellent
Viscosity @ 40°C (cSt)	1.8 - 4.1	2.52	✓ PASS
Sulfur Content (ppm)	Max 15	10	✓ 33% Cleaner
Color (ASTM)	Max 4.0	0.7	✓ PASS
Water/Sediment (vol%)	Max 0.05	0	✓ PASS
Ash Content (%)	Max 0.01	<0.001	✓ PASS
Copper Strip (50°C, 3h)	Max No.3	1a	✓ PASS
Carbon Residue (%)	Max 0.35	0.09	✓ PASS
Lubricity @ 60°C (µm)	Max 520	170	✓ 67% Better
Distillation 90% (°C)	Max 357	318	✓ PASS

## Distillation Profile

Complete distillation curve showing proper volatility characteristics. The 90% recovery point of 318°C is well within the ASTM D975 maximum of 357°C.

Distillation Point	ASTM D975 Limit	Fortrix Result
IBP (Initial)	—	160°C
10%	—	188°C
20%	—	204°C
30%	—	221°C
40%	—	237°C
50%	—	252°C
60%	—	266°C
70%	—	280°C
80%	—	297°C
90%	Max 357°C	318°C
FBP (Final)	—	345°C

*Test Conditions: Barometric pressure 1,005 hPa at 89°F. Recovery 97.8 ml, Residue 1.5 ml, Loss 0.7 ml, Total evaporation 98.5 ml.*

## Laboratory Testing Sources

Testing Source	Date	Type	Scope
Japan Maritime Inspection Association (JMIA)	November 2015	Government Lab	Comprehensive fuel analysis, 15 parameters tested
Independent Private Laboratory	June 2023	ASTM Certified	Full ASTM D975 verification with current ULSD base

### Japan Maritime Inspection Association (JMIA)

The Japan Maritime Inspection Association (JMIA/NKKK) is a government-authorized organization providing independent inspection and testing services. JMIA holds ISO 9001/JIS Q 9001 quality certification. Test results are accepted by maritime regulatory authorities and insurance underwriters worldwide.

Field	Value
<b>Report Number</b>	No.YPE204.2/15
<b>Test Date</b>	November 9, 2015 (Heisei 27)
<b>Client</b>	A.I. Corporation (Kabushiki-gaisha A-I)
<b>Sample Name</b>	Fuel Oil - Sample B
<b>Testing Laboratory</b>	JMIA Physical-Chemical Analysis Center, Yokohama

# JMIA Official Test Certificate

Original test certificate from Japan Maritime Inspection Association, Report No. YPE204.2/15, dated November 9, 2015 (Heisei 27) - Physical-Chemical Analysis Center, Yokohama.



## Japan Maritime Inspection Association

Official Test Certificate - Report No. YPE204.2/15

一般社団法人  
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平成27年11月9日  
報告書 No.YPE204.2/15

**試験報告書**

標品  
標準品

**正本**  
(Ref. TT, AN)

依頼者: 株式会社 エーアイ  
試料名: 燃料油  
試料提供者: 委託者  
備考: サンプル B

試験項目	単位	試験結果	試験方法
1. 密度@15°C	g/cm <sup>3</sup>	0.8442	ASTM D 4052
2. 色 (ASTM)	—	1.1.0	ASTM D 1500
3. 動粘度 (40°C)	mm <sup>2</sup> /s	3.746	ASTM D 445
4. セタン指数	—	53.7	ASTM D 4737
5. 硫黄分	質量%	0.024	ASTM D 4294
6. 脂肪酸メチルエステル	質量%	1.5	経済産業省告示 78 号
7. 水化分	容量%	0	ASTM D 2709
8. 水分	mg/kg	56	ASTM D 6304
9. 灰分	質量%	0.001 未満	ASTM D 482
10. 銅板腐食 (50°C, 3h)	—	1a	ASTM D 130
11. 引火点(PMCC)	°C	92.0	ASTM D 93
12. 残留炭素分 (10%残留)	質量%	0.09	ASTM D 4530
13. 蒸留性状 90% 留出温度	°C	369.8	ASTM D 86
14. 総酸価	J/g	45.520	ASTM D 4868
15. 潤滑性	μm	170	ASTM D 6079

本報告書を他社に転載する場合は、事前に当協会の承認を必要とします。上記の通り報告する。

一般社団法人 日本海事検定協会  
理化学分析センター  
センター長 山本 均

Original test certificate dated November 9, 2015 (Heisei 27) - Physical-Chemical Analysis Center, Yokohama

## JMIA Certificate Translation

English translation of the JMIA test certificate with corresponding ASTM test methods.

Test Item	Unit	Result	Test Method
Density @ 15°C	g/cm <sup>3</sup>	0.8442	ASTM D 4052
Color (ASTM)	—	L1.0	ASTM D 1500
Kinematic Viscosity @ 40°C	mm <sup>2</sup> /s	3.746	ASTM D 445
Cetane Index	—	53.7	ASTM D 4737
Sulfur Content	mass%	0.024	ASTM D 4294
Fatty Acid Methyl Ester	mass%	1.5	METI Notice 78
Water/Sediment	vol%	0	ASTM D 2709
Water Content	mg/kg	56	ASTM D 6304
Ash Content	mass%	<0.001	ASTM D 482
Copper Strip (50°C, 3h)	—	1a	ASTM D 130
Flash Point (PMCC)	°C	92.0	ASTM D 93
Carbon Residue (10%)	mass%	0.09	ASTM D 4530
Distillation 90%	°C	369.8	ASTM D 86
Total Heat Value	J/g	45,520	ASTM D 4868
Lubricity (HFRR)	µm	170	ASTM D 6079

**Note on Sulfur:** The 2015 JMIA test shows higher sulfur (240 ppm) due to different base oil used in testing. Current production using ultra-low sulfur diesel (ULSD) base achieves 10 ppm, as verified in the 2023 testing.

## 2023 Independent Laboratory Verification

Recent independent testing confirms full ASTM D975 compliance using current production with ultra-low sulfur diesel (ULSD) base. This verifies consistent quality for US market applications.

## Performance Benefits

### Superior Ignition Quality

Cetane Index of 54.5 (36% above ASTM D975 minimum of 40) delivers easier cold starting, smoother idle, reduced engine knock, and lower emissions during warm-up. Benefits all diesel applications from locomotives to generators to heavy equipment.

### Ultra-Low Sulfur

At 10 ppm sulfur (33% below EPA maximum of 15 ppm), Fortrix Diesel Ultra burns cleaner and extends the life of diesel particulate filters and exhaust aftertreatment systems. Meets all current EPA requirements with margin for future regulations.

### Exceptional Fuel System Protection

Lubricity of 170  $\mu\text{m}$  (67% better than ASTM maximum of 520  $\mu\text{m}$ ) significantly reduces wear on injection pumps, injectors, and fuel system components. Extends equipment life and reduces maintenance requirements.

### All-Weather Operation

Pour point of  $-24^{\circ}\text{C}$  ensures reliable operation in cold weather without seasonal fuel switching or cold flow additives. Suitable for year-round use in all US climate zones.

## Environmental Benefits

- 30% reduction in CO<sub>2</sub> emissions compared to conventional diesel
- 33% lower sulfur content than EPA maximum
- Enhanced combustion efficiency reduces particulate matter
- Extended storage stability over 1 year without separation
- Can be blended with conventional diesel in any proportion

## Equipment Compatibility

Fortrix Diesel Ultra is 100% compatible with all existing diesel engines and fuel systems—no modifications required. Compatible applications include locomotive engines, marine diesels, stationary generators, construction equipment, agricultural machinery, and over-the-road trucks. Approved for use with all modern emission control systems including DPF, DOC, and SCR. Meets Tier 4 engine requirements.

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For additional technical documentation or supply inquiries, contact Fortrix Energy LLC.

*This specification document relates to laboratory-tested samples.*