



PRODUCT BULLETIN

Introducing Generation XI Fuel Stabiliser

Australia

2009



Generation XI Fuel Stabiliser

ALL PURPOSE FUEL CONCENTRATE FOR ALL LIQUID PETROLEUM HYDROCARBON FUELS

Overview

Gen XI - is a fuel system treatment. It preserves the fuel and keeps the entire fuel / combustion / exhaust system clean, from the tank, through the fuel lines, injectors, combustion chambers and exhaust. The result is greater engine efficiency, improved fuel economy, reduced exhaust emissions and less maintenance downtime.

Gen XI - when used in conjunction with a “Microlube” fuel filter, will provide a complete fuel preventative maintenance system.

Gen XI - is suitable for ALL liquid petroleum hydrocarbon fuels: Unleaded, leaded, and high octane petrol fuels, summer and winter grade diesel fuels, heating kerosene, and bunker fuels. It has not been formally assessed for use in aviation fuels and is not approved for use in aircraft.

Gen XI - is used at a mix rate of 1 litre per 4000 litres of fuel and is extremely cost effective offering up to 5% in fuel savings across the board.

Gen XI - removes water from fuel, fuel tanks, fuel lines and retards fungal growth. The presence of water from condensation, seal leakage, etc can accelerate the degradation of the fuel, especially if high sulphur levels are present. In diesel, water allows microbe growth (eg: *Hormoconis resinae* and *Cladisporium resinae*). These “diesel bugs” feed on the fuel and propagate in the water and this causes fuel degradation and filter/injector blockages.

Gen XI - is also more effective than other similar competitive products at neutralising the harmful effects of acids that form in aged, water-contaminated or high sulphur fuels, and reduces the formation of gum and varnish deposits. Not only are these acids corrosive, but they can also cause catalyst oxidation and premature fuel aging.

Gen XI - allows fuel to burn cleanly and efficiently, and helps keep injectors and combustion chambers clean. Fuel injectors build up deposits from a variety of causes (poor quality fuel, waxes or bio-fouling, improper engine tuning, etc). Such deposits affect the spray pattern of fuel into the combustion chamber so that they develop areas of lean burn and rich burn. The results of this include higher exhaust emission of unburnt hydrocarbons and carbon monoxide, rough engine running, excessive fuel consumption and loss of engine power.

Gen XI - contains dispersants to reduce the accumulation of wax particles, as well as high detergency to keep injectors clean and promote improved fuel combustion. This leads to reduced levels of un-burnt hydrocarbons and carbon monoxide in the exhaust gases i.e. a cleaner and more environmentally responsible burn.

Gen XI – this advanced technology product provides the following features and benefits:

- Suitable for ALL liquid petroleum hydrocarbon fuels, petrol and diesel – flexible use
- Absorbs and removes water from fuel lines and storage tanks – reduces fuel contamination
- Helps neutralize acids in aged or high sulphur fuels – cleaner fuel
- Helps prevent deposits in the fuel tank, lines and injectors - reduces blockages
- Helps decarbonise combustion chambers – cleaner operation and fuel flow
- Prevents fungal and microbe growth – stops fuel contamination
- Reduces harmful exhaust emissions - burns off fuel completely and harmlessly
- Super concentrated - super economical – need small amount at a low cost
- Contains premium top end lubricant – ensures efficient operation

Gen XI - exhibits good biocide activity, as shown by independent testing on diesel fuel with a gross infestation of *Cladosporium resinae*:

Time	Dilution Rate	Gen XI	Competitor
2 Days	1 : 2000	No growth	Bacterial colony present
	1 : 4000	No growth	Bacterial colony present
	1 : 6000	No growth	Bacterial colony present

Gen XI - does not contain phosphates, boron or corrosive ingredients. It has a high flashpoint (> 70 °C) and low toxicity and is free from many transportation restrictions.

Gen XI - variants have been formulated to:

- remain liquid to -30 °C for use in sub-arctic conditions
- contain a premium synthetic top-end lubricant blend
- be more stronger biocide for severe bug infestations
- blend with cheap solvents to give “economy” products for retail sale (use rate 1:200 to 1:1000)
- give optimal performance in low grade bunker fuels
- contain dispersants to reduce the aggregation of wax particles as well as high detergency to keep injectors clean and promote improved fuel combustion. This leads to reduced levels of unburnt hydrocarbons and carbon monoxide in the exhaust gases, as illustrated below:

Gen XI - will pay for itself given its ability to offer up to 5% in fuel savings across the board for all fuels plus the reduction in maintenance costs.

Cetain Levels.

The Cetain level (Combustibility) of diesel fuel is normally 50 when the fuel leaves the refinery. Levels below 40 will not allow diesel engines to operate. Fuels that have been contaminated in transit can cause the Cetain levels to fall to this level. The addition of **Gen XI** will see Cetain levels rise 3-4 points, giving much needed combustibility to “fouled” fuels.

Use

Use **Gen XI** at a mix rate of 5ltrs to 20000ltrs, 1ltr to 4000ltrs, or 250mls to 1000ltrs. Ensure there is no bulk water or sludge in the tank. Drain or clean the tank first if contaminated. Add a Microlube filter system to bulk storage systems to help prevent fuel contamination.

For fleet use, bulk holding tanks should be dosed preferably at time of filling, to ensure adequate mixing. Although this is not a necessity as the product will mix through the fuel as a dispersant.

Where more viscous fuels are used, such as bunker fuels in power stations, **Gen XI** may be metered into the fuel tank outlet line at 1ltr **Gen XI** to 2000 litres of fuel.

Safety

Read the enclosed Material Safety Data Sheet before use. Keep out of reach of children.

Properties

• Appearance: coloured mobile liquid	• pH: neutral
• Specific Gravity: approx 1.0	• Boiling Point: > 120o C
• Flash Point: >65°C	• Flammability : non-flammable
• Corrosiveness: non-corrosive	• Toxicity: non-toxic. Skin and eye irritant.
• Use Rate: 1:2000 to 1:4000	• Fuel Types: all liquid hydrocarbons fuels
• Phosphate Content: nil	• Metal Content: nil
• Alcohol Content: nil	• Aromatic Solvent Content: nil

Exhaust Emissions Testing

Renault 25 (United Kingdom)

- exhaust emissions measured before use of **Gen XI**
 - after 1700 miles (2720 km) with **Gen XI**
 - Fuel saving +15.9 %
 - Emission improvement
- | | |
|-----------------|---------|
| Carbon Monoxide | -51.6 % |
| Carbon Dioxide | +12.0 % |
| Hydrocarbons | -21.0 % |

Caterpillar Diesel (Underground mine, Western Australia)

- emissions measured after 16 hours continuous underground use
 - Emission change
- | | |
|-----------------|---------------------|
| Carbon Monoxide | -46.2 % (low idle) |
| Carbon Monoxide | -14.3 % (high idle) |
| Hydrocarbons | Reduced |

Italy

- Testing for smoke reduction gave positive results of 4-10% in field tests on transport Buses in Milan for the City Transport Commission.

Indonesia

- Testing under the authority of the Badepal and East Java Pollution Control Authority showed significant reduction in both carbon monoxide and unburnt hydrocarbon levels in bench tests on Isuzu 6 cylinder transport trucks.

China

- Testing by the Beijing Automotive Research Institute on diesel bus after top-end purging and flushing and then the introduction of **Gen XI**.

- Emission improvement (hydrocarbons) after purging/flushing -55.6%
- After **Gen XI**. -18.7%

Fishing Boats

We have a number of reports relating to the much extended life of marine exhaust systems of vessels using **Gen XI** due to the reduction of acidic exhaust gases.

Underground Mining

The following assessment of **Gen XI** fuel additive was carried out in an underground mine in Western Australia to determine the benefits in reducing harmful exhaust emissions:

Site : Western Mining, Kambalda, Western Australia

Vehicle/Engine type : Caterpillar 12G Diesel

Gen XI Use Rate : 1 to 4000 v/v in diesel

Testing Authority : BGC Consultants for the Department of Minerals and Energy, WA.

Test Results (February, 1996):

	Low Idle	Fast Idle
Carbon Monoxide (CO)		
No Additive	465 ppm	287 ppm
15 mins after addition	378 ppm	262 ppm
16 hrs after addition	250 ppm	246 ppm
Reduction (%)	46.2 %	14.3 %
Nitrogen Dioxide (NO₂)		
No Additive	102 ppm	72 ppm
15 mins after addition	88 ppm	71 ppm
16 hrs after addition	80 ppm	71 ppm
Reduction (%)	21.6 %	1.4 %

Fuel Consumption Testing

Fleet trials undertaken by end-users over the years have given strongly positive results:

City Council 1 (Victoria, Australia)

7 diesel trucks, various makes; one month fuel consumption baseline plus one month evaluation of **Gen XI** used at 1:4000

Fuel Savings (weighted average) +7.0%

City Council 2 (Western Australia)

7 petrol cars and 3 diesel trucks, various makes; 3 weeks baseline measurement followed by 4 weeks using **Gen XI**.

Fuel Savings	Cars	+1.4%
	Trucks	+13.6%

Food Distribution Company (Western Australia)

5 Diesel trucks, various makes; total fuel used 156,000L; initial system clean-up dose of **Gen XI** 1:2000, thereafter 1:4000.

Fuel Savings	Truck 1	no change
	Trucks 2-5	+3.5%

Fishing Vessel

20m with Fiat V8 Twin Turbo

Fuel Savings after 2 re-fuellings +10%

Transport Company (rural Western Australia)

8 Volvo diesel trucks, covering 360,000 km

Fuel Savings +6.3%

Bus Company (China)

Diesel bus tested by Beijing Automotive Research Institute Vehicle purged, flushed and then **Gen XI** added.

Fuel Savings +5.2%

Railways (China, Malaysia)

diesel locomotives trialling **Gen XI** in China and Malaysia gave excellent fuel savings.

Demonstrations

The step by step demonstrations detailed below are designed to illustrate the principles and processes involved in performing tests against competitive products and the results achieved. Although the proportions of each liquid used here are obviously not the same as found in practice, these demonstrations nevertheless do indicate the types of benefits obtained by using **Gen XI**.

From these demonstrations it can be seen **Gen XI's** advantages over many older technology competitor products (eg Promar, Wynns, Fortron, etc) and newer “me-too” copycat products (eg Liquid Engineering).

1. Water Uptake

The presence of water in fuel (from, e.g. condensation in the tank, leaks, etc.) allows the fouling of fuel tanks, lines and filters through the propagation of biological organisms such as *Cladisporum resinae*, facilitates the formation of sulphur acids and accelerates corrosion. This demonstration shows the superior water uptake capacity of **Gen XI** over traditional fuel additives.

- Add 10 ml of DIESEL and 3ml of competitor fuel additive to a glass test tube (approx 25 ml capacity). Add 1 ml of water, shake the test tube and observe that either the water settles to the bottom of the tube, or sends the diesel milky.
- Repeat in another test tube using 10 ml Diesel and 3ml **Gen XI**. The mixture should be clear with no signs of separation. The water has ‘dissolved’ into the fuel. It will not settle out.
- Mix the contents of both tubes together and see what happens. **Gen XI** is so powerful it can often overcome the shortcomings of the competitor product.

2. Gum and Varnish removal

Gen XI - is also more effective than other products at neutralising the harmful effects of acids in aged or high sulphur fuels and in reducing the formation of and removing existing gum and varnish deposits.

- i) To each of 2 glass test tubes, add about 10 ml Diesel and 10 drops of concentrated sulphuric acid (98%). Brown tarry deposits form.
- ii) To one of the test tubes, add 3 ml of Gen XI and shake thoroughly. The deposits are completely dissolved. To the other test tube, add 3 ml of competitor product and shake. The deposits will not dissolve completely, and become increasingly evident on standing for a few minutes.
- iii) Now fold a paper tissue over several times to form a flat wad. Hold it over the open end of the test tube containing the competitor product with a finger and invert the tube to wet the tissue.

Repeat with the tube containing **Gen XI**. Note the appearance of the area in contact

with the acid/fuel/additive mixtures. **Gen XI** is much cleaner.

3 . Gen XI. Biocide Activity (vs competitive products)

Independent* comparative screening of **Gen XI** and Fuel Set (from Liquid Engineering) for biocide effectiveness was carried out using the following method:

1. Dilute solutions of the fuel additives were prepared in diesel fuel severely infested with micro-organisms (Note - fuel with this degree of infestation not usually found)
2. The solutions were allowed to stand for 16 hours at room temperature to allow time for the additives to have some effect, then dip-slide cultures were prepared.
3. The slides were incubated and observations made after several days.

Results

Time	Dilution Rate	Gen XI	Competitor
2 Days	1 : 2000	No growth	Bacterial colony present
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	1 : 6000	No growth	Bacterial colony present

Conclusion to testing for biocide activity tests.

The results indicate clearly that **Gen XI** displayed much more effective biocide activity in contaminated diesel fuel than any competitor product in these tests.

* Testing was conducted by Geotechnical Services Pty Ltd, Perth, Western Australia.

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

PRODUCT NAME: Generation XI Fuel Stabiliser
SYNONYMS: N/A
UN NUMBER.: N/A
POISONS SCHEDULE: N/A
DANGEROUS GOODS CLASS: N/A
SUB CLASS: N/A
HAZCHEM: N/A
USE AND APPLICATION: Hydrocarbon Additive for Diesel and Petrol Fuels.

HAZARDOUS IDENTIFICATION

Not hazardous according to NOHSC criteria.
Not classified as hazardous by the criteria of the ADG Code.

PHYSICAL DESCRIPTION / PROPERTIES

APPEARANCE AND ODOUR: A clear mobile fragrant liquid.
BP / MP (°C): >120
FI ASH POINT (°C): 67
VAPOUR PRESSURE: 2 - 20
LEL % N/A
UEL % N/A
VOLATILES (%): 50
AUTOIGNITION TEMP: N/A
SPECIFIC GRAVITY: 0.85 - 0.95
pH: Neutral

INGREDIENTS:	FORMULA	CONCENTRATE	CAS NO.
Diethylene Glycol Monobutyl Ether	C8-h18-03	<20%	112-34-5
Ethoxylated fatty Alcohol Surfactants		<30%	68131-39-5
Anionic Detergent(s)		<40%	N/A

HEALTH HAZARDS

SWALLOWED: Unlikely to cause harm if swallowed in small amounts. However, large amounts may lead to nervous system depression, headache, dizziness and loss of consciousness.
EYE: Moderate irritant.
SKIN: Mild irritant. Prolonged exposure may cause dermatitis of defatting. If on skin, wash off with soap and water.
INHALATION: Remove to fresh air. Seek medical advice if effects persist.

FIRST AID

IF SWALLOWED: If poisoning occurs, contact a doctor or poisons information centre. If

Swallowed do NOT induce vomiting. Wash out the mouth if contaminated.

EYE: If contacted in the eye, flood with water for at least 15 minutes and seek medical advice immediately.

SKIN: If skin contact occurs, remove clothing and wash off with soap and water. Remove and launder clothing before re use.

INHALATION: Move to fresh air. Keep warm and at rest. Seek medical attention if you experience any breathing difficulty.

SAFE HANDLING INFORMATION

STORAGE AND TRANSPORT: Store in a cool place. Keep sealed when not in use.

SPILLS AND DISPOSAL: Contain with inert absorbent such as sand. Dispose off in accordance with local council regulations.

FIRE AND EXPLOSION HAZARD:

Combustible. Fire fighters to wear self contained breathing apparatus. Use water sprays to cool fire exposed surfaces and any adjacent storage vessels. Shut off source of product if safe to do so. Remove source of ignition. Use CO₂ or dry powder extinguishers.

PRECAUTIONS FOR USE

EXPOSURE LIMITS; LD50 (oral, rat) >5mg/kg LD50 (dermal, rabbit) >10g/kg TLV (TWA skin absorption, inhalation, 8hre) : 100ppm

VENTILATION: Avoid inhalation of mist, fumes or vapour generated during use. Use in well ventilated area. Ensure ventilation is adequate to maintain air concentrations below exposure standards.

PERSONAL PROTECTION: The wearing of gloves and goggles is recommended. Avoid eye and skin contact.

FLAMMABILITY: Avoid heat and sources of ignition.

CONTACT POINT

FluidMasters Pty Ltd

PO Box 537 Welshpool Western Australia 6106

Ph 1300-302-949 Fax 08) 9470-6033 Mobile 0438-833-220

E-Mail admin@fluidmasters.com.au WEB www.fluidmasters.com.au

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