

GRÜNTROPFEN®

INJECTOR CLEANER & GAS CONDITIONER PERFORMANCE



- Features and benefits
- Typical properties
- LAC performance testing
- No harm testing

SEGHETTIASOCIADOS.COM.AR

SEGHETTI
ASOCIADOS S.R.L.

ABOUT GRÜNTROPFEN BIO- INJECTOR CLEANER/GAS CONDITIONER

A next generation deposit control additive based on proven biotechnology

- Features GRÜNTROPFEN most advanced proprietary EPA Approved Synthetic Detergent for Gasoline.
- Optimized formulation using a combined detergent system and balanced Synthetic Biobased carriers.
- Meets EPA requirements in US commercial LAC (Low Additive Concentration) Street Gasoline.

BIO GRÜNTROPFEN GASOLINE PERFORMANCE ADDITIVE FEATURES AND BENEFITS

Intake Valve Deposit Keep Clean

Improved Fuel Injector Performance

(Keep Clean & Clean Up)

- Port Fuel Injectors
- Direct injection systems
- Sequential central point injection systems (poppets)

Proven performance in ethanol fuels:

- Corrosion reduction
- Water demulsification



BIO GRÜNTROPFEN TYPICAL PROPERTIES

Property	Method	Result
Appearance	Visual	Light amber
Specific Gravity at 15.6°C	ASTM D1298	0.90
Flash Point, °C	ASTM D93	85
Kinematic Viscosity, cSt at 40°C	ASTM D445	7.0

BIO GRÜNTROPFEN INJECTOR CLEANER TREAT RATES

(Commercial Street Gasoline in Test data meets EPA LAC)

Maintenance Performance Features: (Low Treat)

Carburator keep clean and clean-up
Port Fuel Injector keep clean
One tank Port Fuel Injector clean-up
Intake Valve deposit keep clean
Prevent rough idle, hesitation and stalling
Improved fuel economy

Reduced emissions

- **One (1) liquid Ounce treats 15.6 gallons gasoline**
- **One (1) Gallon treats 2.000 gallons gasoline**

Faster Performance Features: (High Treat)

Carburator keep clean and faster clean-up
Port Fuel keep clean and faster clean-up
Intake Valve deposit keep clean and clean-up
Prevent rough idle, hesitation and stalling
Improved fuel economy

Reduced emissions

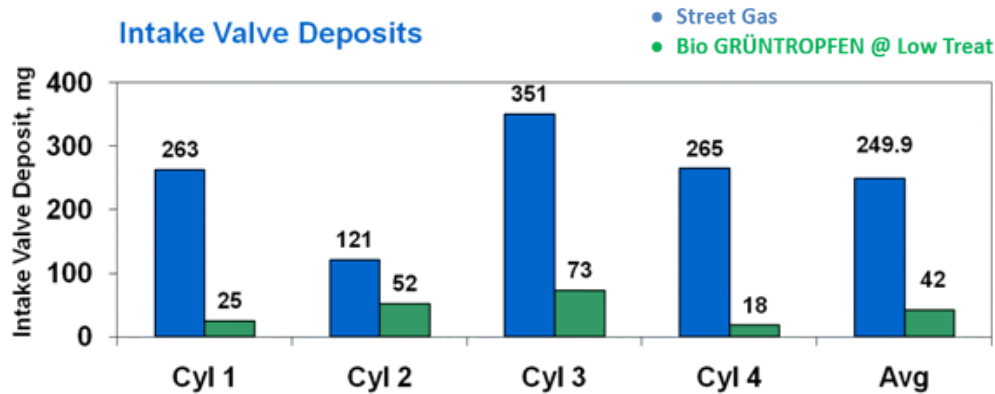
- **Two (2) liquid Ounces treats 15.6 gallons gasoline**
- **One (1) Gallon treats 1.000 gallons gasoline**

EPA LAC
CERTIFICATION DATA



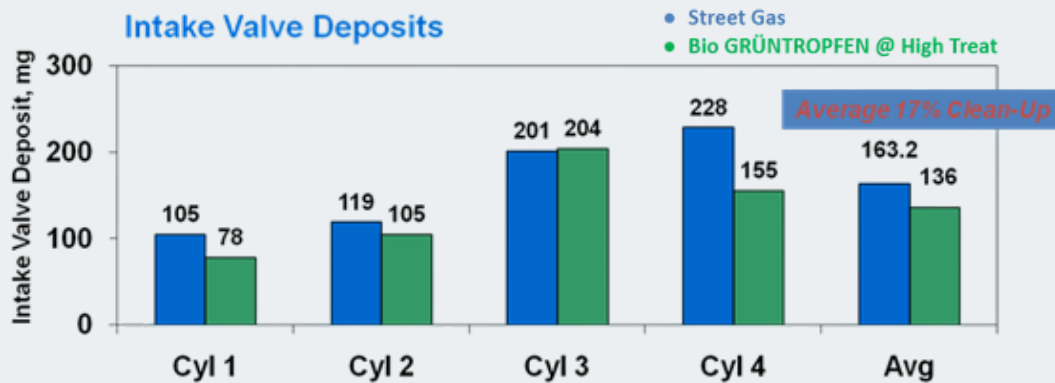
BMW 318I IVD KEEP CLEAN IMPROVEMENT

5 K Mile Street Gas (LAC) vs Street Gas + Bio GRÜNTROPFEN @ Low Treat
Improvement in Keep Clean performance of Street Gasoline



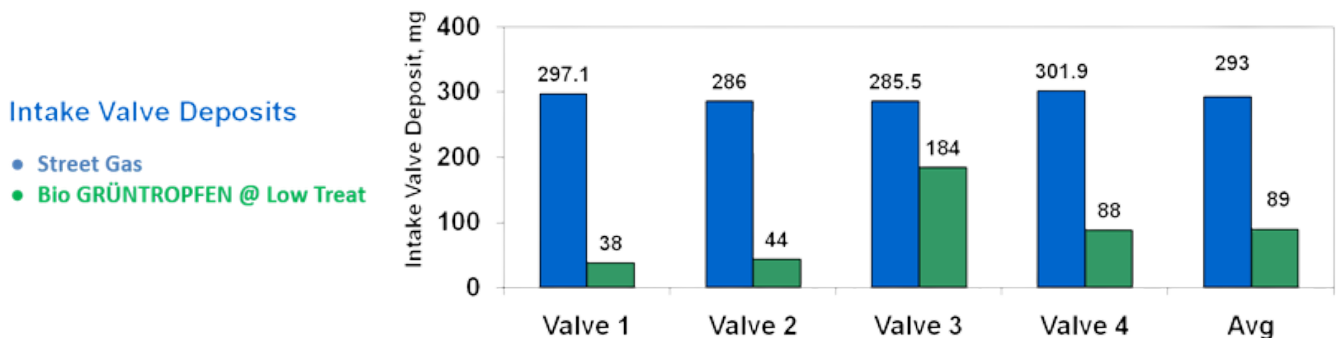
BMW 318I IVD KEEP CLEAN-UP

13K Mile Dirty-up on Street Gas (LAC)
10K Mile Clean-up on same Street Gas Bio GRÜNTROPFEN @ High Treat
It is possible to remove deposits caused by Street Gasoline



BMW 318I IVD TEST

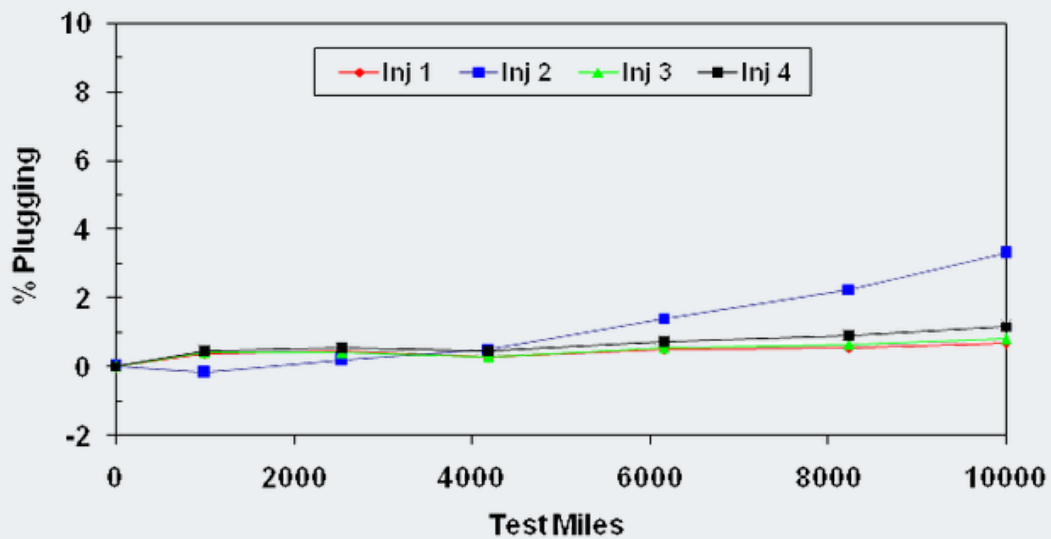
Street Gasoline + 10% Ethanol + Bio GRÜNTROPFEN @ Low Treat



70% REDUCTION IN IV DEPOSITS

CHRYSLER 2.2L PFI KEEP CLEAN

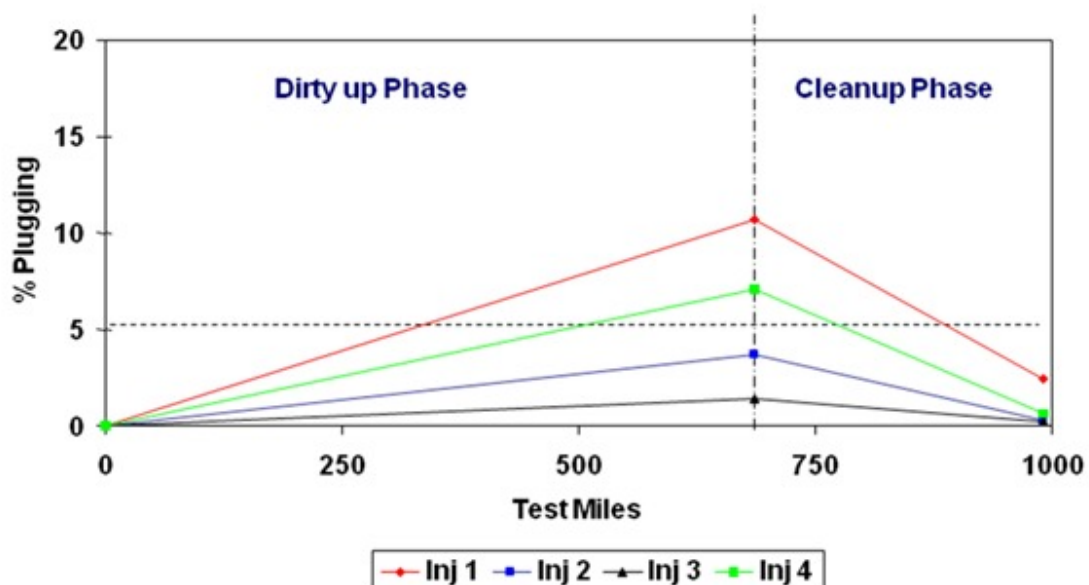
Street Gasoline + 10% Ethanol + Bio GRÜNTROPFEN @ Low Treat



EPA LIMIT = 5%

CHRYSLER 2.2L PFI CLEAN UP

Street Gasoline + 10% Ethanol + Bio GRÜNTROPFEN @ Low Treat



PERFORMANCE DATA



HOW BIO GRÜNTROPFEN GASOLINE PERFORMANCE ADDRESS THE NEEDS OF THE MARKET

Bio GRÜNTROPFEN is:

- Flexible – offer range of treat rates.
- Robust – built on a strong technical data.

What do flexible and robust mean?

- Designed to fit any style, from EPA-LAC (Low Additive Concentration) to Premium Performance.
- Gasoline designed to “keep clean” or gasoline designed to “clean up”, improve fuel economy and reduce emissions.

BIO GRÜNTROPFEN MARKETING CLAIMS

Continued/regular use will clean-up entire intake system

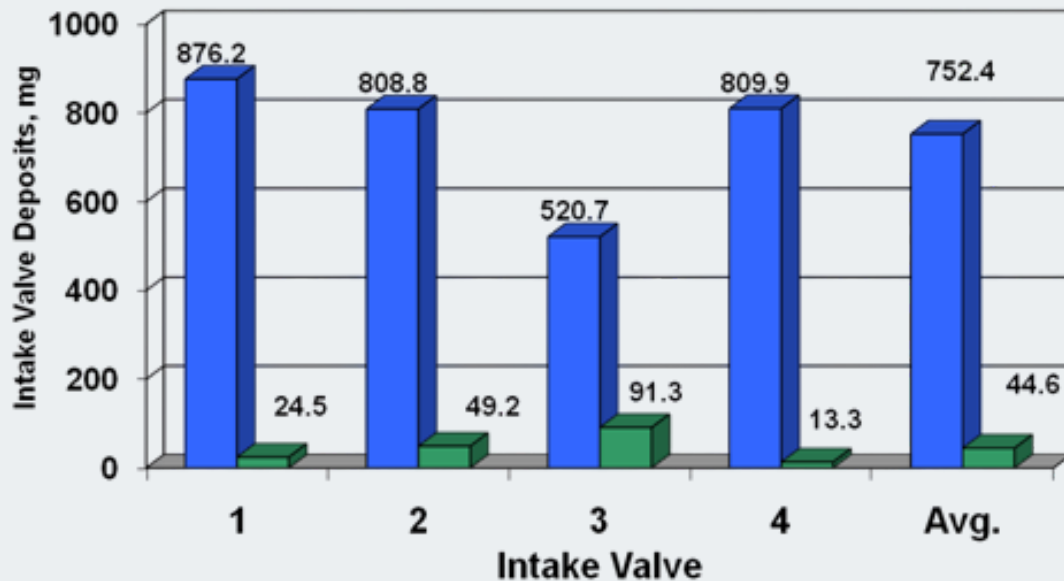
- Carburetor, fuel injectors, intake valves and ports

A “clean intake system” will result in the following:

- Prevent rough idle, hesitation and stalling
- Help improve fuel economy
- Reduce vehicle emissions
- Help restore vehicles performance

FORD 2.3L IVD/CCD TEST

Commercial US Gasoline
Bio GRÜNTROPFEN @ Low Treat



● Base Fuel

● Bio GRÜNTROPFEN @ Low Treat

IVD CLEANUP FIELD TEST

Test Protocol

- Conducted at Independent R & D facility.
- Mileage Accumulation Dyno's (MAD's)
- BMW type driving cycle

Dirty-up phase

- 5,000 mile dirty-up
- Commercial gasoline treated with an LAC additive

Clean-up phase

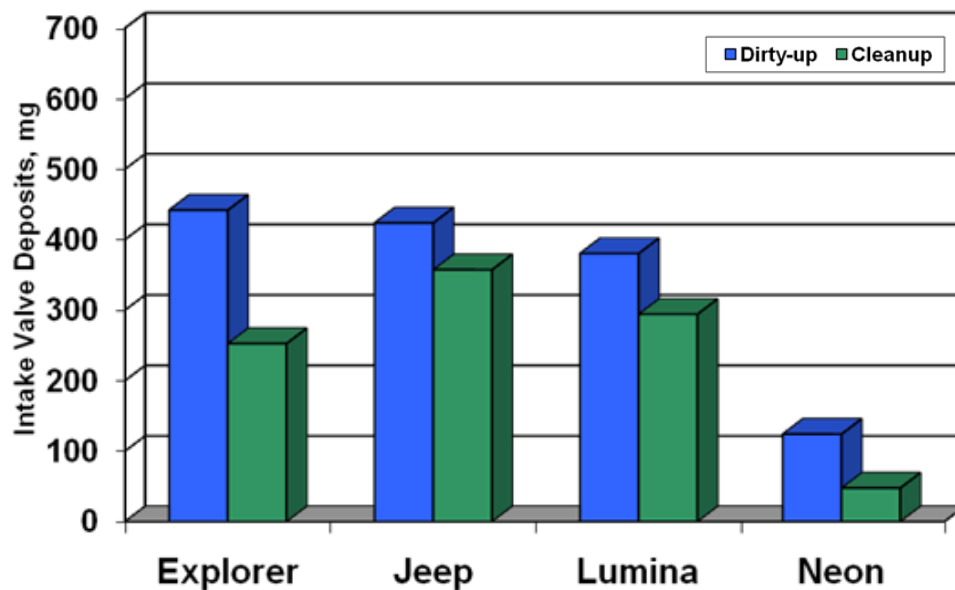
- 5 tank cleanup
- Same base fuel treated with Bio GRÜNTROPFEN @ high treat
- 1,500 miles

TEST VEHICLES

Year	Make	Model	Engine
1999	Ford	Explorer	4.0 L
1998	Jeep	Cherokee	4.0 L
1998	Chevrolet	Lumina	3.8 L
1998	Chrysler	Neon	2.0 L

IVD FLEET TEST

Commercial US Gasoline – Bio GRÜNTROPFEN @ High Treat



TOP TIER PERFORMANCE

Bio GRÜNTROPFEN - Plus meets the requirements of Top Tier:

- GM poppet pass @ High Treat Rate
- GM 5.0L Valvestick passes at @ 3 Times High Treat Rate
- Ford 2.3L IVD/CCD passes @ High Treat Rate

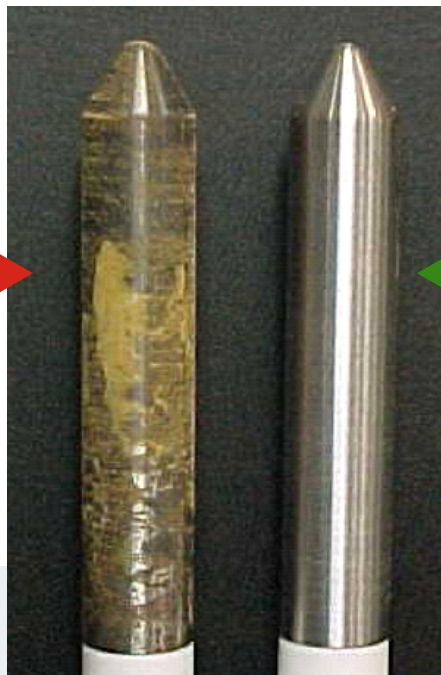
ENGINE NO-HARM DATA



CORROSION PERFORMANCE

ASTM D665A NACE Rust Test

Untreated Gasoline "E"
Rating 100% Rust



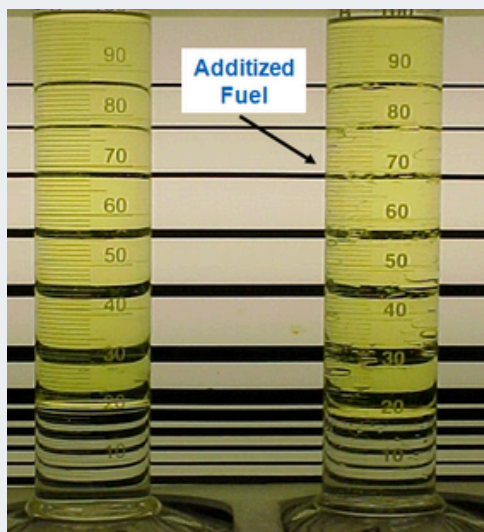
GRÜNTROPFEN®

Gasoline Treated with
Bio GRÜNTROPFEN
@ Low Treat
A Rating
(Clean No Rust)



ASTM D-1094 DEMULSIBILITY

Base + Bio GRÜNTROPFEN @ Low Treat



1b interface - 20 seconds
50% interface is clean



5 min ratings: 1,1,20
(interface, separation, ml water)

INTAKE VALVE STICKING

**Bio GRÜNTROPFEN passed Chemical VW Vanagon
@ three times high treat**

Vehicle: 2.1L Vanagon

Test Location: SwRI

Operating Time: 4.5 hours

Soak time: 16 hours

Soak Temp.: -18 °C

No. of cycles: 3

Fail criteria: No compression is a failure

ASTM SEQUENCE 8

Bearing Corrosion

40-hour test of copper/lead corrosion

- Single cylinder Labeco engine
- 3150 rpm, oil temp @ 143 deg C

API SL/SM requirements

- No more than 26.4 mg or 26.0 mg bearing wt loss

Base Fuel

- 6 mg bearing wt loss

Base fuel + Bio GRÜNTROPFEN @ 3 Times high Treat

- 4.8 mg bearing wt loss

FORD CROWN VIC SLUDGE TEST



1992 4.6L Ford Crown Vic

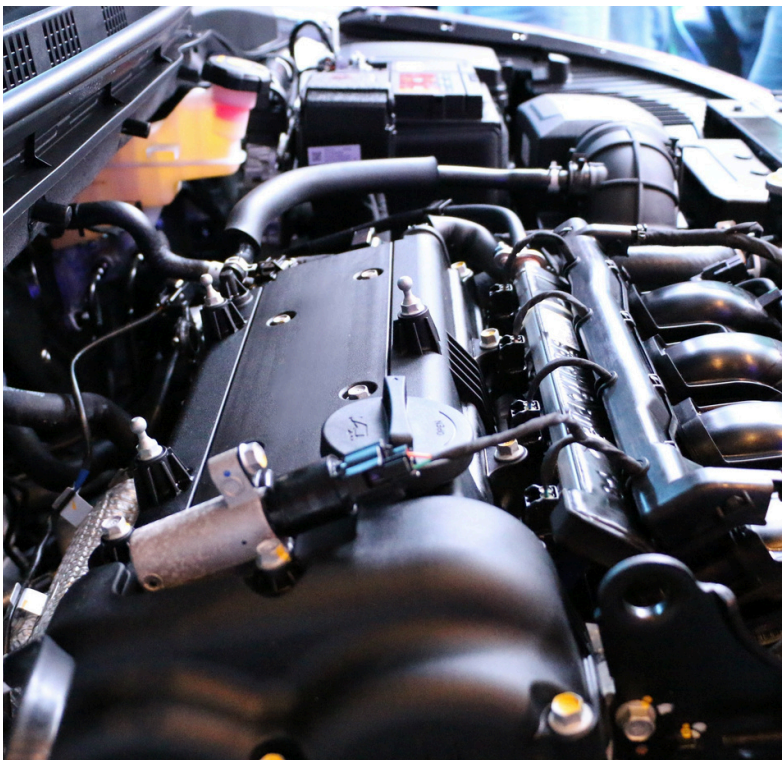
15,000 miles on MADs

High load cycle

No oil drains

Rating areas:

- Sludge Varnish
- Wear
- IVD
- CCD



TEST RESULTS

Parameter	Failing Reference	Bio GRÜNTROPFEN @ 3 times High Treat
Avg.Sludge	8.6	9.5
Avg.Varnish	5.8	8.9
Main Bearings	OK	OK
Rod Bearings	OK	OK

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