



## PRODUCT INFORMATION SHEET

### WYNN'S INJECT-A-CLEAN

Product Number: 71821 12 x 325 ml

WYNN'S INJECT-A-CLEAN is a petrol additive, specifically formulated to clean fuel injection systems together with Wynn's Inject-A-Clean (Product No. 71815).

Wynn's Inject-A-Clean is safe for both oxygen sensors and catalytic converters.

#### Advantages

- Thoroughly cleans fuel injectors without the need for disassembly.
- Absorbs condensation water in the fuel tank.
- Prevents rust and corrosion of the gasoline injection system.
- Lubricates pump, fuel regulator and injectors.
- Reduces wear and prevents seizing of the mechanical parts of the system.
- Ensures optimal combustion.

Wynn's Inject-A-Clean is formulated with the following components to give the above benefits.

- **Alcohols**  
The alcohols absorb the condensation water present in the fuel tank. These alcohols, completely soluble in the gasoline, progressively drag the water through the injection system.

- **Corrosion Inhibitors**  
The corrosion inhibitors prevent rust and corrosion, protecting the parts of the system.
- **Lubricants**  
The lubricants ensure an efficient lubrication of the costly parts of the system, such as the high pressure pump, the fuel regulator and the injectors, protecting them against wear and seizing. These lubricants, specially selected and highly refined, do not form carbon deposits in the combustion chamber.
- **Solvents**  
The solvents keep the injection system clean, especially the injectors, ensuring perfect vaporisation of the petrol. The result is an optimal combustion.

### Applications

Fuel injected vehicles are becoming more and more common. Almost all new petrol-powered vehicles are equipped with some form of fuel injector system. A fuel injector delivers a controlled spray of petrol into the intake manifold of the engine, from which it is drawn into the cylinders by the action of the intake valves. The most popular arrangement is the multi-port fuel injector system, in which there is one injector for each cylinder. There is also the throttle-body arrangement where a single fuel injector supplies all the cylinders, taking the place of the familiar carburettor. Fuel injector systems provide a more controlled supply of fuel to the engine, thereby improving engine efficiency, performance, and reducing emissions.

Unfortunately, certain types of petrol have been found to create deposits on the tips of fuel injectors. These deposits can reduce the amount of fuel delivered by the injector, and they can also adversely affect the spray pattern from the injector nozzle, which is essential to optimum engine performance. Deposits are particularly troublesome with multi-port fuel injector systems. Usually some of the injectors will plug worse than others, with the result that not all the cylinders will receive the same amount of fuel. The consequences are erratic engine performance, loss of power, stumbling, etc. These problems can occur after only 2400km of driving.

Add Wynn's Inject-A-Clean bottle to petrol tank when using Wynn's Inject-A-Clean aerosol can in the Wynn's Inject-A-Clean Machine (Part No. INJ2003).

### Typical Characteristics

Appearance	Clear Thin Liquid
Colour	Blue
Density @ 15°C	0.799 (ASTM D 4052)
Refractive Index @ 20°C	1.378 (ASTM D 1747)
Flash Point (°C) PMCC	12 (ASTM D 93)
Volatiles (% Vol)	93.6

### Performance Data

#### ● **WATER ABSORBING PROPERTIES**

The water absorbing properties of Wynn's Inject-A-Clean have been demonstrated clearly in an in-house test of TÜV-Rheinland. TÜV is a major European Certification Organisation (based in Germany) and is leading in quality approvals for consumer goods.

After adding 3.65% Wynn's Inject-A-Clean to petrol, the fuel was able to absorb about 8% water (four litres water / 50 litres petrol).

Reference: TÜV-Rheinland Certificate 426441911  
Test Method: 2 PfG 956/08.94

### Conclusion

According to the water absorbing activity of Wynn's Inject-A-Clean, the use of this product will eliminate condensation water.

- **PERFORMANCE, EMISSIONS AND FUEL CONSUMPTION**

The study of the effects of Wynn's Inject-A-Clean on emissions, fuel consumption and performance, was conducted by TÜV INSTITUT FÜR FAHRZEUGTECHNIK GMBH. TÜV is a major European Certification Organisation (based in Germany) and is leading in quality approvals for consumer goods.

PROJECT NO. 95009788 - 21 JANUARY 1997

The aim of the project was to examine the effect of Wynn's Inject-A-Clean on performance and emission behaviour in a vehicle. The difference in the cleanness of the injection valves was to be shown through the injection quantities and injection patterns.

- **VEHICLE INFORMATION**

The following vehicle was used for the tests:-

Manufacturer: BMW AG  
Type: 518i  
Engine Type: M10  
Kms Travelled: approx. 130,000 kms

The history of the vehicle was as follows:-

When the vehicle had 100,000 kms approx. on the clock, the injection valves were replaced because of engine jerking, which stopped when the new valves were installed. The valves which had been removed (called the 'old valves' from now on) were kept. In addition, for the tests described below, the existing catalytic converter system was replaced by a normal silencer and the oxygen probe was inactivated.

- **TESTING**

Each of the subsequent tests was carried out as follows:-

- 10 minutes constant 100 km/h on the roller with street loading
- measurement of performance
- 2 x Phase 1 of the FTP75 as preconditioning
- 3 x Phase 1 of the FTP75 as exhaust test with defined warm start

The sequence that developed was as follows:-

- measured flow through standard valves
- determination of injection quantities / patterns for old valves
- measured flow through old valves

- operation of vehicle with old valves over 470 kms with a tank of fuel and one bottle of Wynn's Inject-A-Clean (325ml) and 500ml of distilled water.
- determination of injection quantities / patterns for old valves
- further operation of vehicle with old valves over 1,030 kms with two tanks of fuel and Wynn's Inject-A-Clean (325ml each) and 500ml of distilled water each.
- determination of injection quantities / patterns for old valves
- measured flow through old valves after total of 1,500 kms %cleaning operation+
- measured flow through standard valves, back-testing

- ENGINE PERFORMANCE

Engine performance was measured during each measurement sequence via wheel performance. Wynn's Inject-A-Clean was not found to have any effect on engine performance.

- EMISSIONS AND FUEL CONSUMPTION

The individual values and, in particular, the average values, are shown in the table below. A comparison of the average values from the standard status (Test No. 14212) and standard status / back-testing (Test No. 14263) shows that the vehicle remained stable over the test period. It must be concluded from this that the changes in the state %Old Valves after recording of injection patterns / quantities+(Test No. 14213) and in the state %Old Valves + 1,500 kms+(Test No. 14253) are solely the result of the installation of the old valves and the effect of Wynn's Inject-A-Clean. According to this, there was a clear reduction in CO (9.59 g/km to 7.85 g/km) and a slight improvement in HC (1.272 g/km to 1.218 g/km). These two reductions were countered by a slight increase in NOx emissions (2.21 g/km to 2.36 g/km); it must be emphasised here that these improvements (CO, HC) / deteriorations (NOx) are conclusive in themselves. The effect of Wynn's Inject-A-Clean gave a slight improvement in fuel consumption, determined from the C balance.

Status	Series	Old Valves after Recording Injection Patterns / Quantities	Old Valves + 1,500 kms	Standard Status Back-Testing
<b>Test Number</b>	<b>14212</b>	<b>14213</b>	<b>14253</b>	<b>14263</b>
<b>Date</b>	<b>27/01/97</b>	<b>28/01/97</b>	<b>10/02/97</b>	<b>12/02/97</b>
<b>Phase 1</b>				
CO [g/km]	7.17	9.93	7.96	7.89
HC [g/km]	1.219	1.249	1.199	1.242
NOx [g/km]	2.39	2.19	2.40	2.32
CO <sub>2</sub> [g/km]	165.67	165.44	164.32	163.18
B [l/100 km]	7.62	7.80	7.61	7.57
<b>Phase 2</b>				
CO [g/km]	7.09	9.51	7.88	7.76
HC [g/km]	1.247	1.294	1.243	1.324
NOx [g/km]	2.42	2.21	2.40	2.39
CO <sub>2</sub> [g/km]	165.61	157.74	162.54	165.76
B [l/100 km]	7.62	7.45	7.54	7.68
<b>Phase 3</b>				
CO [g/km]	6.63	9.32	7.70	7.45
HC [g/km]	1.129	1.274	1.212	1.243
NOx [g/km]	2.39	2.22	2.28	2.33
CO <sub>2</sub> [g/km]	162.91	162.37	162.97	162.34
B [l/100 km]	7.46	7.63	7.54	7.50
<b>Average Values from Phase 1 - 3</b>				
CO [g/km]	6.96	9.59	7.85	7.70
HC [g/km]	1.198	1.272	1.218	1.270
NOx [g/km]	2.40	2.21	2.26	2.35
CO <sub>2</sub> [g/km]	164.73	161.85	163.28	163.76
B [l/100 km]	7.56	7.63	7.56	7.58

- **INJECTION QUANTITIES**

The measured injection quantities are shown in the table below. No significant or minor change can be determined.

Valve No.	Duration of injection (ms) each	Injection Quantities			No. of injections each in thousands jewells in TSD
		20/01/97	03/02/97	10/02/97	
ED1	4	9.40	9.28	9.28	5000
	8	20.75	20.47	20.28	4000
	12	31.75	31.75	31.50	2000
ED3	4	9.06	9.00	8.88	5000
	8	19.53	19.80	19.85	4000
	12	30.65	30.75	30.80	2000
ED4	4	9.40	9.28	9.24	5000
	8	20.50	29.45	20.38	4000
	12	31.90	31.75	31.50	2000
ED5	4	9.15	9.15	9.06	5000
	8	20.05	20.10	20.00	4000
	12	31.40	31.10	31.00	2000

The fuel temperature for all measurements was between 23°C and 26°C; in view of this narrow margin, no correction was made. Organisationally, the same employees determined the injection quantities; this minimised deviations in the results.

- **INJECTION PATTERNS**

The injection patterns were documented using a video camera under stroboscopic light, cf. enclosed cassette.

The jet distribution for the individual injection valves was determined as follows: individually, the valves sprayed at paper held vertically at a distance of 20 cms. The edges of the spray area were marked with felt-tip pen immediately afterwards.

- **SUMMARY**

Wynn's Inject-A-Clean has a cleaning effect on the injection valves. This can be seen in emissions and in fuel consumption. The effect can also be seen in the jet patterns. However, there was no measurable effect on performance or on quantities injected.