



PRODUCT INFORMATION SHEET

WYNN'S COOLING SYSTEM TREATMENT

Product Number: 51502 20 litre

WYNN'S COOLING SYSTEM TREATMENT is a concentrated, water based solution of corrosion inhibitors, anti-foaming agents (to prevent air entrainment and water pump cavitation), and anti-scale compounds formulated to provide excellent protection for modern cooling systems.

Wynn's Cooling System Treatment combats electrolysis, prolongs cooling system life, and meets the requirements of the Australian / New Zealand AS/NZS 2108.1:1997 for Engine Coolant Type B.

Advantages

Wynn's Cooling System Treatment is compatible with all glycol based winter/summer coolants and reinforces anti-rust and anti-foam characteristics, resulting in extended coolant life.

- **REDUCES CORROSION**

The action of highly effective corrosion inhibitors in this product significantly reduce the rust and corrosion of metals used in cooling systems.

Wynn's Cooling System Treatment contains chemistry designed to provide anti-corrosion protection to cooling systems of the bi-metal type which contain various components composed of copper, solder, brass, steel, cast iron and aluminium.

- **PREVENTS FOAMING**

The strong action of the anti-foaming agents present, reduce or eliminate foam in systems filled with water or glycol/water mix, increasing the overall efficiency of the cooling system by preventing air entrainment and water pump cavitation.

Wynn's Cooling System Treatment contains a dual anti-foam system, one being designed to provide additional anti-foam protection during initial engine warm-up. The other being designed to supplement the anti-foam included in permanent winter/summer coolant solutions after normal operating temperature is reached.

- **PREVENTS SCALE DEPOSITS**

Wynn's Cooling System Treatment prevents scale deposits from forming and clogging radiators and other vital components of cooling systems.

Water contains dissolved inorganic matter which is present in the compositions of soil and rock materials which the water comes into contact with.

Because of its origin, water contains different amounts and types of scale forming solids, such as calcium, magnesium and silica.

Scale acts as an insulator and reduces the amount of heat that has to be transferred away into the cooling system.

For example, 0.75mm of scale has the same insulating properties of 5cm of steel.

Scale formation is of particular concern in large industrial cooling systems where scale build-up traps heat and eventually causes engine problems.

- **INCREASES LIFE OF WINTER/SUMMER COOLANT**

Wynn's Cooling System Treatment is formulated to enhance and help restore the rust and corrosion protection incorporated in factory fill and after market ethylene glycol based winter/summer coolant solutions.

- **INCREASES EFFICIENCY OF COOLING SYSTEMS**

Wynn's Cooling System Treatment is a specifically designed blend of chemical corrosion inhibitors capable of providing rust and corrosion inhibiting properties to automotive cooling systems using water only as a coolant where applicable.

The reduction of deposits, corrosion and anti-foaming action maintains cooling systems in a like new condition that promotes maximum efficiency.

Applications

Wynn's Cooling System Treatment exceeds the performance requirements of the Australian and New Zealand Standard AS/NZS 2108.1:1997. Wynn's Cooling System Treatment is a "TYPE B" coolant concentrate and is not recommended as an alternative for formulated ethylene glycol "TYPE A" coolant concentrates where they are specified for use by the manufacturer. Wynn's Cooling System Treatment is not recommended as an initial fill, complete fill, top-up, or to fill from empty, where "TYPE A" coolant is specified.

Wynn's Cooling System Treatment has been formulated for use in the cooling systems of petrol and diesel engines of trucks, buses, off-road equipment, stationary engines and ships. Care should be taken with heavy duty diesel equipment if using coolant filters pre-treated with dichromates. Dichromates plus glycol and/or additional treatment can give a brownish silicate precipitate (mud-like). Where dichromates are not used, no problem exists. Wynn's Cooling System Treatment is safe with all hoses, gaskets, clamps and fittings.

Wynn's Cooling System Treatment can also be used as a corrosion inhibitor to protect underground fuel storage tanks filled with water when abandoned or when welding fittings.

- **DIRECTIONS**

The Recommended Dosage of Wynn's Cooling System Treatment is 3% by volume to systems using water/glycol mixtures, and 5% by volume in systems using pure water.

Use at 1% when required for protecting water-filled underground fuel storage tanks.

- **WATER QUALITY**

Hard water and saline water (salt) are the cooling system's enemies. It is therefore important to check the quality of the water that is being put into the engines.

Recently, manufacturers have reduced the amount of chlorides and total hardness allowable for their engines.

	<u>TOTAL HARDNESS</u>	<u>TOTAL CHLORIDES</u>
Caterpillar	170 ppm	40 ppm
Cummins	300 ppm	100 ppm
Detroit	170 ppm	40 ppm

It is important to note that there are large seasonal variations in the quality of the water being used.

Regular checking of the water quality can only benefit the end user.

Typical Characteristics

Appearance	Clear Aqueous Liquid
Colour (Visual)	Rhodamine Red
pH (Concentrate)	11.9 (ASTM D 1287)
pH (5% in Distilled Water)	11.6 (ASTM D 1287)
Density @ 15°C	1.080 (ASTM D 4052)
Flash Point (°C)	None
Freeze Point (°C)	0
Boiling Point (°C)	100

Features

Wynn's Cooling System Treatment meets or exceeds the following tests:-

- * ASTM D1384 - Glassware Corrosion Test
- * ASTM D1881 - Glassware Foaming Test
- * ASTM D2570 - Simulated Service Corrosion Test
- * ASTM D2809 - Cavitation Aluminium Corrosion Test
- * ASTM D2847 - Vehicle Service Test
- * ASTM D4340 - Hot Surface Aluminium Corrosion Test

ASTM D-1384

CORROSION TEST FOR ENGINE COOLANT IN GLASSWARE

This is a beaker type procedure used for evaluating the corrosive affects of engine coolants on six standard metal test specimens under controlled laboratory conditions.

Wynn's Cooling System Treatment was added directly to the standard ASTM Corrosive Water (anhydrous sodium salts and distilled water) at 3% and 5% by volume.

ASTM D1384 CORROSION TEST
ASTM CORROSIVE WATER AND WYNN'S COOLING SYSTEM TREATMENT
CORRECTED COUPON WEIGHT CHANGE (mg)
AVERAGE OF THREE SETS

	<u>ASTM Corrosive Water Only</u>	<u>WYNN'S C.S.T. at 3% By Volume</u>	<u>WYNN'S C.S.T. at 5% By Volume</u>
Copper	-3.00	-1.00	-0.23
Solder	-61.00	-4.13	-3.06
Brass	-3.00	-2.53	-2.40
Steel	-125.00	-0.76	+0.40
Cast Iron	-216.00	+1.10	-0.60
Cast Aluminium	-40.00	+0.06	+1.73

INDUSTRY MAXIMUM ALLOWABLE SPECIFICATIONS

	<u>General Motors GM 1899-M</u>	<u>Ford ESE- M97843-a</u>	<u>Ford ESE- M97B18-C</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	10	10	9	10
Solder	20	20	16	15
Brass	10	10	9	10
Steel	10	10	9	10
Cast Iron	10	10	10	10
Cast Aluminium	20	20	31	15

Two sets of tests were conducted using 3 commercially available brand name anti-freezes. A base line was first established on the 3 commercial brand anti-freezes to determine how well their anti-rust and anti-corrosion additives protected various metal specimens.

The test was then re-run with each new anti-freeze plus the addition of Wynn's Cooling System Treatment at a treat level of 5%, to test for performance characteristics and compatibility of Wynn's Cooling System Treatment with the various additives used by different anti-freeze manufacturers.

**ASTM D1384 CORROSION TEST
50/50 NEW ANTI-FREEZE AND ASTM CORROSIVE WATER
CORRECTED COUPON WEIGHT CHANGE (mg)**

	<u>Brand A</u>	<u>Plus Wynn's C.S.T. at 5% By Volume</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	-1.27	+0.70	10 Max.
Solder	+0.77	+2.70	15 Max.
Brass	+1.70	+0.87	10 Max.
Steel	+1.20	+0.80	10 Max.
Cast Iron	+0.57	+0.10	10 Max.
Cast Aluminium	+4.10	+4.23	15 Max.

	<u>Brand B</u>	<u>Plus Wynn's C.S.T. at 5% By Volume</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	-2.57	-1.86	10 Max.
Solder	-2.10	+0.26	15 Max.
Brass	+1.40	+0.16	10 Max.
Steel	+0.17	+0.66	10 Max.
Cast Iron	Nil	+0.76	10 Max.
Cast Aluminium	+1.33	+1.86	15 Max.

	<u>Brand C</u>	<u>Plus Wynn's C.S.T. at 5% By Volume</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	-0.97	-0.50	10 Max.
Solder	+1.83	+2.16	15 Max.
Brass	+0.50	+0.23	10 Max.
Steel	-0.03	+1.36	10 Max.
Cast Iron	-1.43	+0.86	10 Max.
Cast Aluminium	+0.50	+2.63	15 Max.

Used coolant was collected at random from four vehicles and tested to determine the performance benefits of Wynn's Cooling System Treatment when used as an anti-freeze corrosion inhibitor rejuvenator.

A sample of each coolant was first tested to determine the coolant's corrosion protection ability. A second sample of each coolant was then treated with Wynn's Cooling System Treatment at different levels ranging from 3% to 5% by volume to determine product performance benefits when added between anti-freeze changes.

ASTM D1384 CORROSION TEST
CORRECTED COUPON WEIGHT CHANGE (mg)

FORD F 350 TRUCK

	<u>Untreated</u>	<u>Plus Wynn's C.S.T. at 3.1% By Volume</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	-10.0	+1.2	10 Max.
Solder	-2.1	- 0.2	15 Max.
Brass	-9.8	-0.6	10 Max.
Steel	-0.4	+0.7	10 Max.
Cast Iron	-2.8	+0.2	10 Max.
Cast Aluminium	+1.1	+2.9	15 Max.

TOYOTA HI-LUX

	<u>Untreated*</u>	<u>Plus Wynn's C.S.T. at 4.6% By Volume</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	-4.8	+1.2	10 Max.
Solder	-43.8	- 1.9	15 Max.
Brass	-10.9	-0.3	10 Max.
Steel	-444.5	+0.5	10 Max.
Cast Iron	-119.0	-0.1	10 Max.
Cast Aluminium	-112.4	+0.8	15 Max.

* Coolant drained from the Toyota Hi-Lux contained "water only" as a cooling medium.

MAZDA RX4U

	<u>Untreated</u>	<u>Plus Wynn's C.S.T. at 5.0% By Volume</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	-1.2	+2.4	10 Max.
Solder	+1.8	+1.3	15 Max.
Brass	-8.6	-0.8	10 Max.
Steel	-0.3	+0.9	10 Max.
Cast Iron	-0.7	+0.9	10 Max.
Cast Aluminium	+1.5	+4.7	15 Max.

TOYOTA CELICA

	<u>Untreated</u>	<u>Plus Wynn's C.S.T. at 3.0% By Volume</u>	<u>Australian / New Zealand AS/NZS 2108.1:1997</u>
Copper	-11.2	+3.1	10 Max.
Solder	+1.5	+0.4	15 Max.
Brass	-9.8	+1.3	10 Max.
Steel	-1.1	-2.3	10 Max.
Cast Iron	0.0	-1.9	10 Max.
Cast Aluminium	+2.1	+4.2	15 Max.

ASTM D 1881

FOAMING TENDENCIES OF ENGINE COOLANTS IN GLASSWARE

This is a beaker test used to evaluate the tendency of engine coolants to foam under laboratory controlled conditions of aeration and temperature. The volume of foam and the time for the foam to break are measured to determine if a coolant passes or fails.

If a coolant foams and becomes aerated as it circulates through the cooling system of a vehicle, the air trapped within the coolant will not allow the coolant to dissipate heat from the cooling system as readily as a coolant that controls the rate of foaming. In addition, air entrapment in the coolant rapidly depletes the corrosion inhibitors in the system due to the presence of free oxygen which results in premature corrosion of metallic components.

The following tests were conducted to show the foam control benefits provided by Wynn's Cooling System Treatment when added at 3 and 5% by volume to anti-freeze/water solutions.

	<u>Foam Volume (ml)</u> <u>5 minutes</u>	<u>Break Time</u> <u>Seconds</u>
1. 50/50 Anti-Freeze and distilled water	26.6	2.1
2. 50/50 Anti-Freeze and distilled water plus 3% volume Wynn's C.S.T.	17.3	1.2
3. 50/50 Anti-Freeze and distilled water plus 5% volume Wynn's C.S.T.	11.6	1.2

Wynn's Cooling System Treatment was also tested at 3% and 5% by volume in distilled water to test its ability to help control foaming in a "water only" environment.

	<u>Foam Volume (ml)</u> <u>5 minutes</u>	<u>Break Time</u> <u>Seconds</u>
1. Distilled water plus 3% volume Wynn's C.S.T.	15	2.3
2. Distilled water plus 5% volume Wynn's C.S.T.	17	2.8
3. Standard Specification AS/NZS 2108.1:1997 maximum allowable specifications	150	5.0

ASTM D 2570

SIMULATED SERVICE CORROSION TESTING OF ENGINE COOLANTS

This test procedure developed jointly by the ASTM and SAE to evaluate the affects of circulating engine coolants on metal test specimens and automotive cooling system components under controlled, laboratory conditions.

Duration of this test is 1064 hours at a controlled temperature of 88°C and a 114 to 132 litres per minute circulating flow.

The ASTM corrosive water used in the test is made from three anhydrous sodium salts: 1) sodium sulphate, 2) sodium chloride and 3) sodium bicarbonate, and is very corrosive to the six standard metal test specimens and automotive components used in the test.

The two tests with Wynn's Cooling System Treatment were conducted using ASTM corrosive water to increase test severity and Wynn's Cooling System Treatment at different treat levels with no anti-freeze present to dilute the ASTM corrosive water.

ASTM D 2570 CORROSION TEST
CORRECTED WEIIGHT CHANGE (mg)
AVERAGE OF THREE SETS
ASTM CORROSIVE WATER AND WYNN'S COOLING SYSTEM TREATMENT

	<u>Plus 3%</u> <u>Wynn's C.S.T.</u>	<u>Plus 5%</u> <u>Wynn's C.S.T.</u>	<u>Australian /</u> <u>New Zealand</u> <u>AS/NZS</u> <u>2108.1:1997</u>
Copper	-3.8	-4.7	20 Max.
Solder	-2.4	-1.4	60 Max.
Brass	-3.1	-0.8	20 Max.
Steel	-2.9	+0.5	20 Max.
Cast Iron	+3.0	+3.6	20 Max.
Cast Aluminium	-6.0	+2.9	60 Max.

ASTM D 2847

ENGINE COOLANTS IN VEHICLE SERVICE

This test was developed jointly by the ASTM and SAE for evaluating the corrosion protection and performance of an engine coolant in vehicle service. Six standard metal test specimens, which are representative of the metals typically used for cooling system components, were installed into the coolant flow of each vehicle by means of a special holder.

The scope of this test was three fold. First, to establish the corrosion protection level of the used unknown brand of anti-freeze in each vehicle. Second, after baseline was established, to treat the prestressed anti-freeze of each vehicle with Wynn's Cooling System Treatment at different treat levels, ranging from 3.1% by volume for the Ford F 350 Truck and 5.0% by volume for the Mazda RX4. And third, because the treat levels directly correspond with the ASTM D 1384 Glassware Corrosion Test previously conducted on samples of coolant from each vehicle, to compare the test results between the ASTM D 1384 and ASTM D 2847 Test to help establish the protection level of the corrosion inhibitive properties and performance of Wynn's Cooling System Treatment.

Duration of the baseline test for the Ford F 350 Truck was 112 days and 97 days for the treated portion of the test with 3.1% volume Wynn's Cooling System Treatment. The Mazda RX4 was operated for 112 days on baseline and 99 days for the treated portion of the test with 5% volume Wynn's Cooling System Treatment.

ASTM D 2847 VEHICLE SERVICE TEST
USED ANTIFREEZE AND WYNN'S COOLING SYSTEM TREATMENT
CORRECTED WEIGHT CHANGE (mg)

FORD F 350 TRUCK

	<u>Baseline</u>	<u>Plus Wynn's C.S.T. at 3.1% By Volume</u>	<u>ASTM D 3306 SAE J 1034</u>
Copper	-2.1	-0.4	20 Max.
Solder	-27.6	-14.3	60 Max.
Brass	-2.4	-7.5	20 Max.
Steel	+1.5	+1.2	20 Max.
Cast Iron	+2.2	+1.7	20 Max.
Cast Aluminium	+11.8	+9.6	60 Max.

MAZDA RX4

	<u>Baseline</u>	<u>Plus Wynn's C.S.T. at 5.0% By Volume</u>	<u>ASTM D 3306 SAE J 1034</u>
Copper	-1.9	-0.2	20 Max.
Solder	-18.9	-22.7	60 Max.
Brass	-5.1	-1.7	20 Max.
Steel	+0.5	+0.7	20 Max.
Cast Iron	+1.8	+1.8	20 Max.
Cast Aluminium	+12.4	+16.4	60 Max.

ASTM D 4340

TEST FOR ALUMINIUM CYLINDER HEAD HEAT TRANSFER CORROSION

This test is to help achieve a better understanding of heat transfer corrosion that takes place on aluminium cylinder heads and to better understand what effect different anti-freeze corrosion inhibitor type packages have in retarding heat transfer corrosion of aluminium.

Three commercially available brand name anti-freezes were tested. After completion of the above baseline test, the tests were again duplicated but with the addition of Wynn's Cooling System Treatment at a treat level of 5% to test for performance characteristics and compatibility of product with anti-freezes that are commercially available on the market place today and recommended for use in engines incorporating aluminium components.

ASTM D4340 CORROSION TEST MAXIMUM WEIGHT LOSS (-1.0 mg/cm²/week)

<u>Commercial Available Anti-Freezes</u>	<u>50/50 Anti-Freeze and ASTM Corrosive Water</u>	<u>50/50 Anti-Freeze and ASTM Corrosive Water Plus 5% Wynn's C.S.T.</u>
Brand A	-0.1762	+0.0342
Brand B	-0.0832	-0.0440
Brand C	-0.0293	+0.0342

The following tests were conducted using tap water only (no anti-freeze) to help measure the corrosion that can take place on aluminium components within the cooling system of an automobile using water only as a coolant where applicable.

A test was conducted using tap water to establish a baseline on the rate of corrosion on an aluminium disc.

The test was reconducted with the addition of Wynn's Cooling System Treatment at a treat level of 5% by volume to a new sample of the above tap water to show the corrosion protection provided by product in water only systems.

	<u>Corrosion Rate (mg/cm²/week)</u>
Tap Water Only	-1.3024
Tap Water Plus 5% Wynn's C.S.T.	-0.2402
Standard Specification AS/NZS 2108.1:1997 Maximum Allowable Weight Loss	1.000