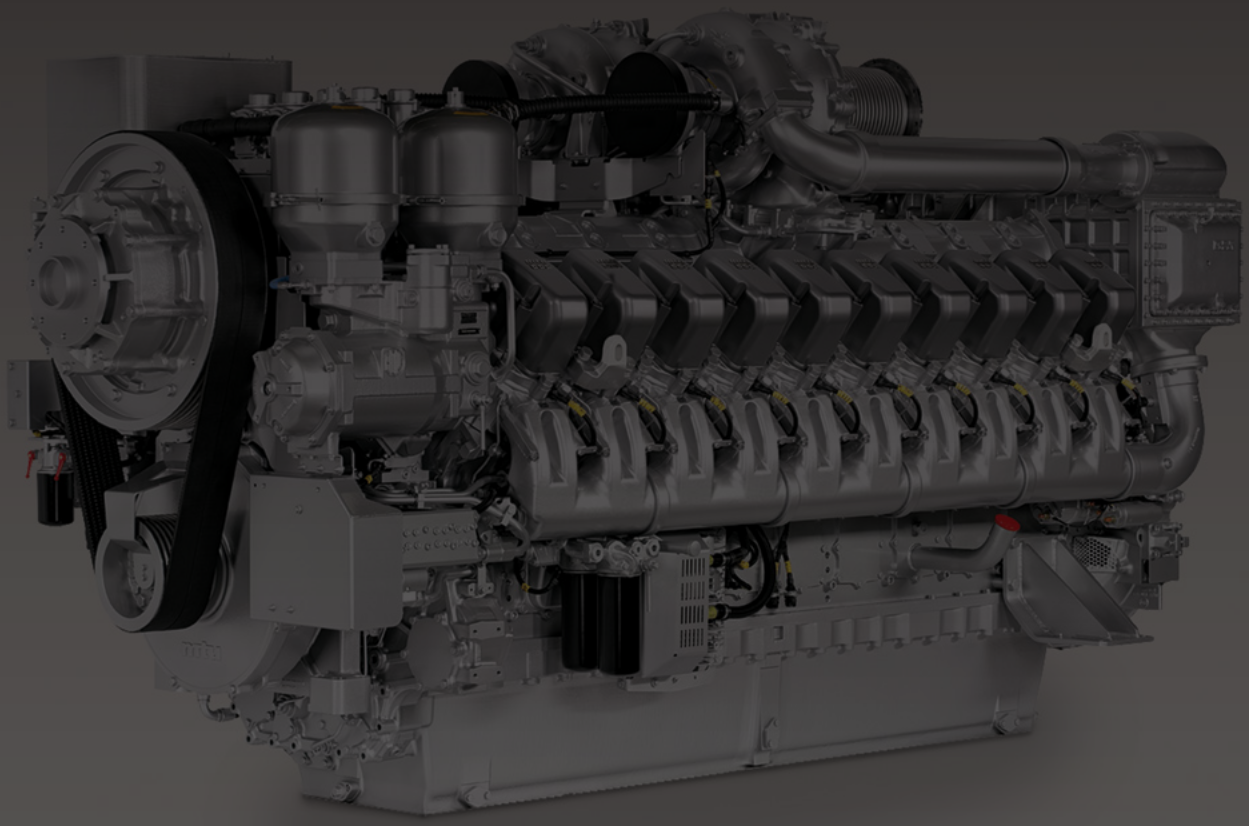
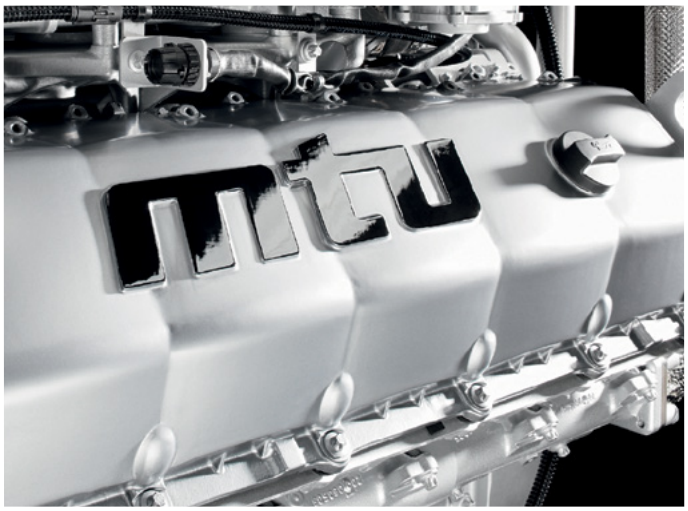
POWERCOOL®

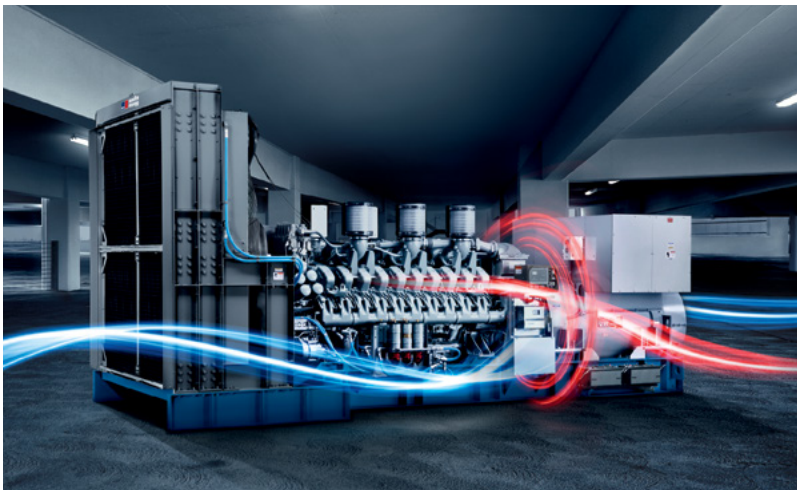


OFF HIGHWAY COOLANT CATALOGUE

PENSKE
Australia

CONTENTS





THE POWER COOL ADVANTAGE

It is estimated that up to 40% of total engine repair costs originate from cooling system issues. Visible symptoms relating to cooling system problems often only show up when serious damage has already occurred.

In addition to the loss of income resulting from equipment downtime, a lack of cooling system maintenance can ultimately result in an expensive catastrophic engine failure.

Ensuring your cooling system is included in your Preventative Maintenance plan is the first step to protecting the integrity and reliability of your engine. Penske recommend a regular coolant sampling regime to monitor and anticipate issues before they develop into more serious problems.

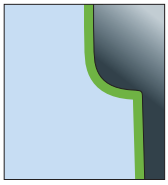
Using industry best products, such as the POWER COOL range of coolants, which are backed by years of proven performance in some of the most hostile environments and arduous conditions is the next step to getting the best performance and reliability out of your Diesel or Gas power plant.

At Penske we know what's best for your engine. We will recommend the right product for the application and conditions to ensure you get the best out of your equipment whilst minimizing the total cost of ownership.

THE POWER COOL ADVANTAGE

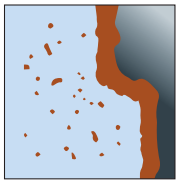
Corrosion Protection

With Power Cool

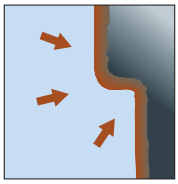


Power Cool advanced technology creates a protective layer to protect against metal corrosion and erosion.

Without Power Cool



All exposed metal components are damaged by corrosion.

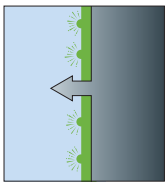


Particles dislodged by corrosion circulating in the cooling system leading to further erosion damage to exposed metal surfaces and components.

Liner Pitting/Cavitation Protection

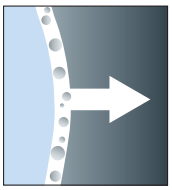
Liner vibration causes vapour bubbles to collapse, generating shock waves which damage the liner surface, ultimately leading to premature failure. The same phenomenon can affect water pumps and other cooling system components.

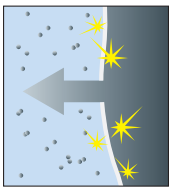
With Power Cool



Power Cool advanced technology reduces the level of cavitation as well as its effect on exposed surfaces by forming a protective barrier

Without Power Cool



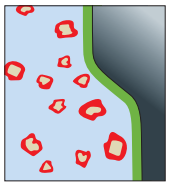


Liner vibration from piston slap causes minute vapour pockets to form. When the liner moves in the opposite direction the pressure increases causing the vapour pockets to collapse (cavitation). As this process continues many times a second, metal particles from the liner surface become dislodged, leading to metal erosion and premature liner failure.

Scale Build Up Prevention

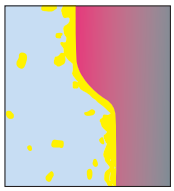
The build up of scale within the hot surfaces of your engine and cooling system can have a detrimental affect on performance and durability of your asset. Consequences include reduced hot surface cooling and restricted coolant flow which can lead to the premature degradation of critical components and ultimately catastrophic engine failure.

With Power Cool



Power Cool Advanced Technology prevents the build up of scale within the cooling system.

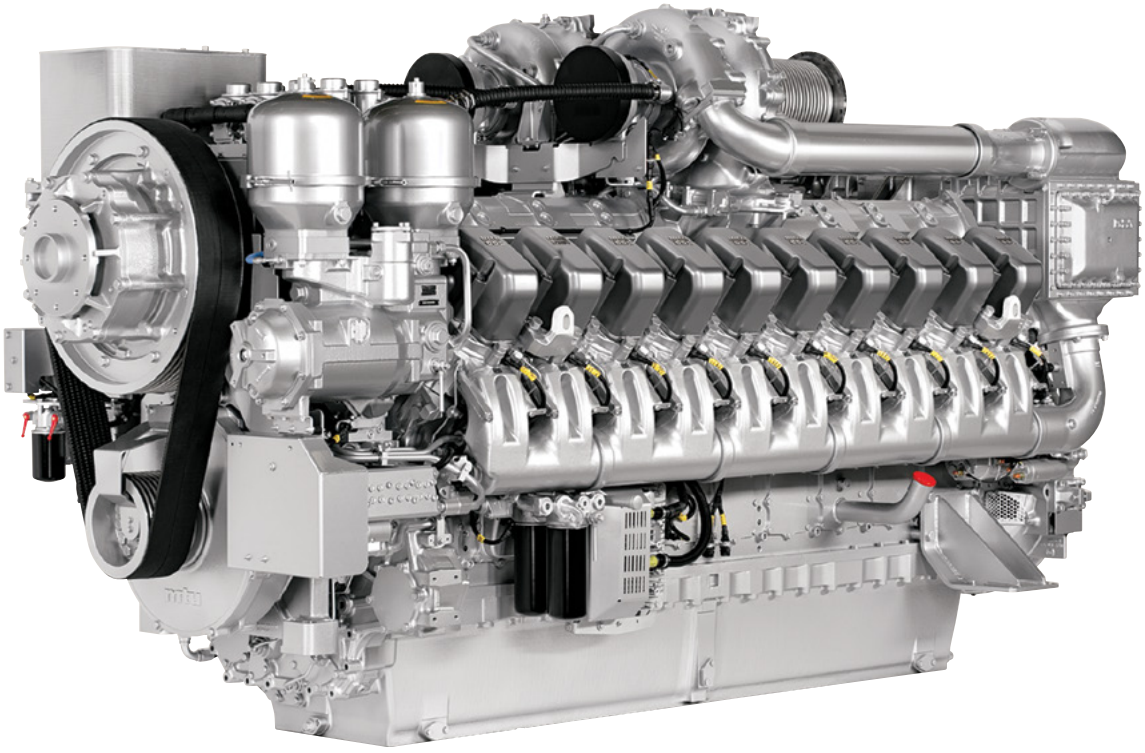
Without Power Cool



Hot surfaces within the engine allow scale to accumulate. This build up of scale creates a layer of insulation which prevents the cooling system from removing heat from critical engine components.

Power Cool pH Control

Power Cool coolants are formulated with buffering technology to neutralise and prevent the formation of acids. Acidification is caused by the degradation of antifreeze and combustion gases entering the cooling system. Therefore, maintaining the coolant pH at an acceptable level is essential for sustaining engine integrity.



THE POWERCOOL EXTENDED LIFE RANGE

POWER COOL PRODUCT	COLOUR	DESCRIPTION	FEATURES	BENEFITS	PRODUCT SERVICE LIFE*
POWER COOL HB800		• Hybrid Organic Acid Technolgy (HOAT) • Ethylene Glycol Premix 50%	• Contains Nitrite • Low silicate, free of phosphates and amines	• No supplemental additive required during service life • Excellent wet sleeve liner protection against cavitation • Meets and exceeds industry standards	Extended life 6 years,12,000 hours or 1,000,000 km (whichever comes first)
POWER COOL HB500-NF			• Nitrite Free • Low silicate, free of phosphates, nitrites and amines		
POWER COOL HB500-C		• Hybrid Organic Acid Technology (HOAT) • Ethylene Glycol Concentrate			
POWER COOL PLUS EXTENDED LIFE		• Organic Acid Technology (OAT) • Ethylene Glycol Premix 50%	• Free of 2EHA (2-Ethylhexanoic Acid) • Free of nitrate, nitrites, amines phosphate and silicates (NAPS free)		
POWER COOL GF9443		• Proprietary Organic Acid Technology (OAT) • Glycol Free	• Free of 2EHA (2-Ethylhexanoic Acid) • Free of Ethylene Glycol, silicates, phosphate, borate, nitrate, nitrites and amines		
POWER COOL GF9477-C		• Proprietary Organic Acid Technology (OAT) • Glycol Free Concentrate			
POWER COOL HB850PG		• Hybrid Technology • Propylene Glycol Premix 50%	• Contains Nitrite • Low silicate, free of phosphates and amines		

*Always refer to the OEM maintenance procedures or fluid and lubricant guidelines for recommendations regarding drain intervals.

PRODUCT SELECTION GUIDE

ENGINE OEM	APPLICATION[1]	ENGINE SERIES	POWER COOL PRODUCT (OEM APPROVED)
mtu	• INDUSTRIAL • MINING • POWER GENERATION	1600	HB500
		2000GX6	HB500
		2000 (Other)	HB800[2] HB500
		4000 (Diesel)	HB800[2] HB500
	• RAIL	4000(Gas)	HB500
		2000	HB800[2] HB500
		396	HB500
		4000	HB500
Mercedes Benz	• INDUSTRIAL	OM Series	Power Cool Plus Extended Life
DEUTZ	• INDUSTRIAL	All Diesel	Power Cool Plus Extended Life

NOTES:

1. Glycol Free options are available for underground mining and environmentally sensitive applications
2. Check for light alloy in cooling system and seek advice from your Penske representative

Contact your Penske representative for a cooling system solution to address specific installation or environmental conditions, mixed fleets and other OEM applications not mentioned in the above list. We have a range of speciality solutions to suit non-standard applications and will work with you to achieve a favourable outcome.

FINDING PRODUCT DATA SHEETS

Visit penske.com.au/data-sheets or use the QR code below for more detailed information on specific POWER COOL products and to find the relevant Safety Data Sheets.

HB800

HB500-NF

EL+

HB850

GF9443

GF9477-C

HB500-C

Click on the images above to read more detail information on each product data sheet

COOLANT CONDITION MONITORING

Penske recommends a regular coolant conditioning monitoring process as part of a robust preventative maintenance strategy.

Cooling system failure is one of the major causes of equipment breakdown, however this is often the most overlooked of all the engine sub-systems. The most effective way of monitoring the condition of the cooling system is through regular testing.

Just as is the case with engine oil, engine coolant can be exposed to contamination, additive and glycol dilution, additive mixing, and oxidation from extreme temperatures.

Additionally, testing can reveal unseen problems within a cooling system, such as cavitation, corrosion, and impending component failure before any of these become major issues. Laboratory testing removes the uncertainty, and regular testing allows you to closely monitor the integrity of your cooling system.

Coolant sample kits can be ordered from your nearest Penske branch (as well as kits for testing lubricants and fuel).

All fluid sampling is conducted by independent 3rd party laboratories which are either Certified to ISO 9001:2015 or Accredited to ISO 17025:2005 UKAS ref 4028.

COOLANT CHANGEOVER & BEST PRACTICE

DRAIN, FLUSH, FILL*

Drain all existing coolant fluid from the cooling system and dispose of it in accordance with standard coolant disposal processes (bearing in mind that used coolant fluid may be considered hazardous waste).

Flushing can be conducted with water (rather than flushing with new POWERCOOL coolant). Therefore, thoroughly flush the cooling system with good quality water (demineralised or deionised).

Fill with selected Power Cool coolant following the relevant OEM instructions to ensure cooling system integrity.

*Refer to Penske Australia bulletin TSD13-04 for more details (contact your Penske representative or nearest Penske branch for a copy).

BEST PRACTICE

Coolant is a critical functional fluid in an engine and the following should be put in practice to maximize engine uptime and reduce overall cost of ownership:

- Instigate a regular coolant sampling practice across your fleet to monitor cooling system integrity.
- When in doubt about the cooling fluid currently in use: Drain, Flush and Fill with new Power Cool coolant.
- When topping up coolant, make sure that the existing fluid in use is in a clean and an uncontaminated condition.
- Always use the same coolant for topping up unless in a planned coolant changeover process.
- Mixing different types of coolants will most likely result in the service life being compromised and will distort sampling analysis results.
- If in doubt seek advice. Technical support is available from Penske Australia.

PART NUMBERS AND PACKAGING

POWER COOL PRODUCT	PART NUMBER	UNIT OF MEASURE*
HB800 50/50 PREMIX	800PM20 800PM205 800PM1000	20 LITRE 205 LITRE 1000 LITRE
HB500-NF 50/50 PREMIX	500-NFPM20 500-NFPM205 500-NFPM1000	20 LITRE 205 LITRE 1000 LITRE
HB500-C CONCENTRATE	500-NFCT20 500-NFCT205	20 LITRE 205 LITRE 1000 LITRE
GF9443 GLYCOL FREE	9443-GFPM20 9443-GFPM205 9443-GFPM1000	20 LITRE 205 LITRE 1000 LITRE
GF9477-C CONCENTRATE	9477-GFCT20 9477-GFCT205 9477-GFCT1000	20 LITRE 205 LITRE 1000 LITRE
HB850 PG 50/50 PREMIX	850-PGPM1000	1000 LITRE
POWER COOL PLUS EXTENDED LIFE	23549210 23549215 23549220	5 LITRE 20 LITRE 205 LITRE

NOTE: *Premix products available in bulk upon request.

MANUFACTURER WARRANTY

RECOCHEM AUSTRALIA MANUFACTURER WARRANTY FOR THE POWERCOOL RANGE OF PRODUCTS (GLYCOL AND WATER BASED COOLANTS)

On the understanding that there is not a coolant in the global market that is approved by all OEM's, Recochem Inc. recommends the POWERCOOL coolant range, for use in all heavy duty diesel applications and engines including but not limited to Cummins, Caterpillar, Komatsu and MTU.

1. POWERCOOL coolant range has a limited warranty of up to 1,000,000 km or 12,000 hours or 4 years, which ever comes first in heavy-duty diesel applications as outlined in the Recochem product data sheet for this product.
2. POWERCOOL coolant range must be used and maintained in accordance with the engine manufacturer coolant maintenance schedule and recommendations for water based OAT engine coolant.
3. Premixing of any POWERCOOL concentrates to the required dilution must be carried out with de-ionised water. In accordance with the instructions stated in the manufacturer product data sheet.
4. If a coolant system component that comes into direct contact with the coolant is found to fail as a direct result of the failure of the engine coolant to fulfil its job within the stated warranty period, Recochem Inc. will have the failed part fixed or replaced at its discretion.

   4.1. In the event of a coolant related failure where rectification work is required to return the engine to service, all such repairs on MTU, Detroit and Mercedes Benz diesel engines will be performed at a Penske Power Systems facility or nominated authorised dealership.

   4.2. The rectification work referred to in 4.1 will be performed at factory warranty labour rates, times and parts pricing, with fair and reasonable remove, replace, and travel time.

5. This limited warranty does not cover normal wear and tear and applies if all the following conditions are met:

   5.1. The coolant system was in good shape at the time it was drained and flushed (cleaned if necessary) prior to the addition of the Recochem product as defined in Section 1 of this document.

   5.2. Only coolant properly made from Recochem POWERCOOL is present in the coolant system.

   5.3. All top up of the finished product made from Recochem POWERCOOL coolant is done using Recochem POWERCOOL coolant.

   5.4. The dilution water used, must meet OEM requirements for the quality of water used to make a water based coolant.

   5.5. The customer follows all the recommendations of Recochem Technical Service Department and the OEM with regards to installation, top-up and in-field monitoring of the product.

6. Recochem Inc. is not liable for failures or damage resulting from abuse, incorrect storage, modification (incorrect dilution and/or use of poor quality water), neglect or misuse of POWERCOOL CONCENTRATE and the finished coolant made

7. This warranty is conditional upon the customer providing written notice of any claim pursuant to this warranty, and Recochem Inc. being satisfied that:

   7.1. POWERCOOL coolant was defective as received in its original unopened container.

   7.2. OR that POWERCOOL coolant was received used and maintained properly but did not perform to stated claims.

8. The written notice of claim must include, at a minimum, a description of the issue, the failed part, a sample of the coolant in the system at time of failure and the maintenance records for the failed unit.

9. Recochem Inc.'s warranty is limited to the claims of product meeting stated specifications.

10. LIMITATION OF LIABILITY

Notwithstanding any other provision herein, the products are provided by Recochem to the customer with no other conditions, representations and warranties whatsoever. In no event shall Recochem and its affiliated entities be liable in contract, tort or otherwise to any person or entity for any direct, indirect, incidental, punitive, special or consequential damages, including, without limitation, any damages resulting from loss of use, business interruption, loss of profits and/or revenue, loss of savings, the cost of procurement of substituted goods.

POWERCOOL WARRANTY CLAIM PROCEDURE

1. If a coolant issue arises in the field, the customer representative is to contact the Recochem Account Manager or Recochem Technical Team immediately with the details regarding the failure.

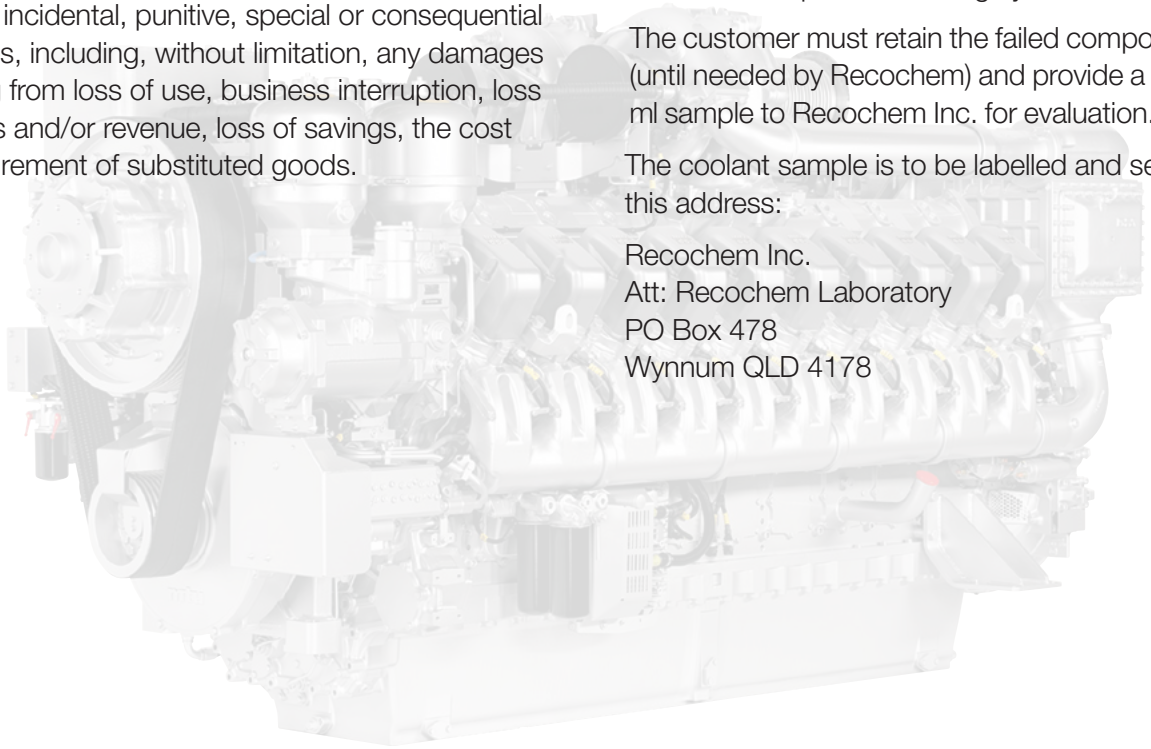
2. Details should include:

   - The equipment make and model
   - How the coolant was added, i.e. was the coolant added to a product already in the system or was the system was drained, flushed and filled and the fill used was the Recochem product?
   - The condition of the coolant system prior to the addition of the Recochem water based OAT engine coolant?
   - All maintenance records before and during the use of the Recochem water based coolant
   - What has been used for cooling system top-ups
   - Number of km's/hours since last coolant change
   - Any data on the operation of the coolant system prior to and during the in-field use of the Recochem water based coolant an example may be does the cooling system tend to overheat?
   - A description of cooling system failure

The customer must retain the failed component (until needed by Recochem) and provide a 1000 ml sample to Recochem Inc. for evaluation.

The coolant sample is to be labelled and sent to this address:

Recochem Inc.
Att: Recochem Laboratory
PO Box 478
Wynnum QLD 4178



GLOSSARY OF TERMS

The overwhelming tendency of most Original Equipment Manufacturers (OEM's) is to primarily recommend ethylene glycol based coolants in their radiators. Some people in Australia question this; however the OEM's are based in areas such as Japan, Europe and North America, whereby the antifreeze component of an antifreeze/anti boil (glycol) fluid is essential for the winter months.

Term/ Specification	Definition and comments
ASTM	American Society for Testing Materials
ASTM E1177	Specification for virgin and re-distilled EG and PG
ASTM D7713	Specification for aqueous engine coolant grade glycol nominal 53 volume %
ASTM D3306	Standard spec. for Glycol (EG and PG concentrate and 50/50 predilute) based autmotive and light duty service engine coolants. (Note: ASTM D 4656 no longer exists and is built into ASTM D 3306)
ASTM D4340	Lab screening procedure for effectiveness of coolants preventing corrosion of heat rejecting aluminium (Al) in Al cylinder head engines
ASTM D4985	Standard spec. for low silicate EG based coolant for HD engines requiring SCA. (Note: ASTM D 5345 no longer existis and is built into ASTM D 4985)
ASTM D1384	Glassware lab test to evaluate corrosion protection of antifreeze on metal specimens/ system component
ASTM D1881	Lab test to evaluate tendency of coolant to foam under standard conditions (air/ temperature)
ASTM D2570	Lab test to evaluate circulating of antifreeze on metal specimens/system component
ASTM D6210.10	Fully formulated glycol based coolant for heavy duty diesel engines – MEG and PG based. (Note: ASTM 6211 which referred to PG coolant is now part of ASTM D6210.17)
ASTM D7583	Deere Liner Cavitation Test
ASTM D2809	Lab test to evaluate effects of antifreeze on Al water pumps under caviation corrosion
CES 14603	Cummins Material Specification for Heavy Duty Diesel EG and PG Based Coolant
CAT EC-1	Caterpillar specification for EG and PG based engine coolant
EG Engine Coolant	EG based fluid containing corrosion inhibitors (for metals including copper, iron and Al), scale inhibitorsand anitfoam agents, with EG providing antiboil/antifreeze
SCA	Supplemental Coolant Additive – a concentration of corrosion inhibitors used to extend coolant life in heavy duty diesel vehicles
SAE	Society of Autmotive Engineers (USA origin)

Term/ Specification	Definition and comments
SAE J1034	Standard specification for automotive engine coolant
SAE J1941	Standard specification for diesel engine coolant
TMC	Truck Maintenance Council (USA origin)
RP 302B	Recommended practice of TMC for specifying EG based engine coolant
RP 329	Recommended practice of TMC for specifying Heavy Duty Diesel EG based engine coolant similar to ASTM D 6210-08. There is a type A which requires nitrite and a type B which requires a combination of nitrite and molybdate
AS2108-2004	Most relevant Australian standard relating high glycol Type A and low glycol or glycol free Type B engine coolants (automotive)
DEXCOOL™	GM Trademark for their long life automotive engine coolant
Long Life	Currently somewhat ill-defined but in general for an automotive coolant it is up to 250,000km or 5 years; for heavy duty it is typically up to 6 years, 12,000 hours or 960,000km (Chevron Texaco goes as high as 1,600,000 km or 15,000 hours)
GM 6038M	GM recipe for light duty engine coolant formulation requiring addition of SCAs
GM 1825M	GM performance requirements for automotive engine coolant
GM 1899M	GM performance requirements for light duty and heavy duty diesel engine coolant

Recochem Inc. will initiate an evaluation of the coolant sample to determine the “root cause” of the cooling system failure. Recochem Inc. will provide a report outlining the likely cause of the failure, and future preventative actions.

Agency	Specification
Australian Standard	AS 2108:2004
ASTM	D 3306/D 4340/D 4985/D 6210/ D 7583
SAE	J 1034/J 1941
GM	1825 M/1899 M
TMC	RP 329 Type A or B
Caterpillar	1EO 535, EC-1
Cummins	Bulletin 3666132, MS 14603
Detroit	Bulletin 93K217
Chrysler	MS7170/MS 9769/ MS 12601
Mercedes Benz	DBL 7700
MAN 324	TUC 1637/77
MTU	(EVP 1 1827/MTL 5048) and NA
John Deere	JDM HD24
Saab Scania	6901

PENSKE AUSTRALIA BRANCH NETWORK

Contact your local Penske branch for engine parts and service support.

NEW SOUTH WALES

Sydney
78-82 Riverside Road
Chipping Norton NSW 2170
Ph: 02 9794 2600

Kings Park
11-13 Garling Road
Kings Park NSW 2148
Ph: 02 8822 7000

Kings Park
Defence Programmes Group
7 Garling Road
Kings Park NSW 2147
Ph: 02 8825 6100

Hunter Valley
\42-44 Enterprise Crescent
McDougalls Hill NSW 2330
Ph: 02 6572 1012

SOUTH AUSTRALIA

Adelaide
103-107 West Avenue
Edinburgh SA 5111
Ph: 08 8209 0000

WESTERN AUSTRALIA

Perth
22 Stockyards Lane
Hazelmere WA 6055
Ph: 08 9273 7777

Kalgoorlie
54 Kakarra Road
West Kalgoorlie WA 6430
Ph: 08 9026 2521

VICTORIA

Melbourne
488 Blackshaws Road
Altona North VIC 3025
Ph: 03 9243 9292

TASMANIA

Launceston
225 Georgetown Road
Rocherlea TAS 7248
Ph: 03 6325 0000

NORTHERN TERRITORY

Darwin
18 Mendis Road
East Arm NT 0822
Ph: 08 8998 9700

QUEENSLAND

Brisbane
196 Viking Drive
Wacol QLD 4076
Ph: 07 3877 6060

Lytton
2/52 Trade Street
Lytton QLD 4178
Ph: 07 2100 7600

Mackay
17 Commercial Avenue
Paget QLD 4740
Ph: 07 4952 8500

Townsville
Cnr Ingham Road & Ronald Court
Mount Louisa QLD 4814
Ph: 07 4412 0300

Cairns
60 Buchan Street
Portsmith QLD 4870
Ph: 07 4042 9200

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