



## Technical Bulletin



# Asian Vehicle

## ANTIFREEZE/COOLANT

Long Life, Aluminum Protection,  
Silicate and Borate Free Formula

Zerex Asian vehicle (AV) antifreeze coolant is a new automotive engine coolant developed by Valvoline. The patented\* silicate free, hybrid organic acid technology formulation ( HOAT ) has a service life of up to five years or 150,000 miles. It incorporates premium state-of-the-art phosphated organic acid additive technology in an ethylene glycol base for complete protection of today's modern cooling system and engine components.

Valvoline's Zerex AV contains no silicates, borates, 2-ethylhexanoic acid (2-EHA), amines or nitrites. It is compatible with premium long life Asian coolants, both for service and factory fill. Valvoline recommends Zerex Asian for all late model Asian vehicles. It is dyed light violet to distinguish its unique chemistry from traditional coolants and to promote color compatibility.

Zerex Asian vehicle meets both the ASTM D3306 and JIS K2234-1994 specifications. When diluted 50% with water, it protects all modern engine components from winter freezing and summer boiling. The chart at the top right provides detailed mixing information. Zerex AV is storage stable for up to five years as both a concentrate or diluted with water. It contains a high quality defoamer and will not harm gaskets, hoses, plastics or original vehicle paint.

Zerex Asian is formulated for use in the following applications / industry coolant specifications:

Hyundai / Kia MS 591-08  
 Toyota / Scion / Lexus  
 Honda / Acura  
 Nissan / Infinity  
 Mitsubishi ES-X64217  
 Subaru  
 Mazda / Ford WSS-M97B55-A  
 Suzuki  
 Isuzu  
 Dae Woo  
 Daihatsu  
 JIS K2234-1994  
 ASTM D3306  
 ASTM D4985  
 SAE J1034, SAE J814, SAE J1941  
 Federal Specification A-A-870A

Zerex Asian Antifreeze Coolant Boil/Freeze Protection		
% Antifreeze	Freezing Point, °F/°C	Boiling Point**, °F/°C
40	-12/-24	260-126
50	-34/-36	265/128
70*	-90/-67	277/135

\* Maximum freeze protection is at 70%.

\*\* Boiling point shown using conventional 15 psi radiator cap.

Typical Physical Properties		
Antifreeze Glycols	mass %	91.0
Corrosion Inhibitors	mass %	7.0
Water	mass	2.0
%		250 / 121
Flash Point	°F/°C	9.54 /4.33
Weight per gallon @ 60°F/16°C	lbs/KG	<10 max
Silicon as Si	ppm	<10 max.
Borates as B	ppm	

Aluminum Water Pump Tests		
ASTM D2809 Pump Cavitation		
Test Period	Results	Specification
100 hours	10	8

ASTM cavitation corrosion rating: 10 - perfect 1 - perforated

Valvoline recommends that spent coolant never be disposed of by dumping into a septic system, storm sewer or onto the ground. Instead, contact your state or local municipality for instructions on where to and how to properly dispose of this coolant and protect our environment.

If any coolant is spilled onto the ground, contain the spill and call the state authorities and ask for proper instruction on how to clean up the spill.

**Important:** While the information and data contained in this bulletin are presented in good faith and believed to be reliable, they do not constitute a part of our terms and conditions of sale unless specifically incorporated in our Order Acknowledgment.

ASTM D4985	Specifications	Typicals	ASTM Method
Chloride	25 ppm max	<10	D3634
Silicon ppm as Si	<10	<1	-
Specific gravity, 60/60° F	1.1220 – 1.1450	1.1450	D1122
Freezing point, 50% V/V	-34°F/-36°C	-34°F/-36°C	D1177
Boiling point, undiluted	325°F/162°C	347°F/175°C	D1120
Boiling point, 50% V/V	226°F/107°C	227°F/108°C	D1120
Effect on engine or vehicle finish	No Effect	No Effect	-
Ash content, mass %	5 max.	<5	D1119
pH, 50% V/V	8 - 9	8.4	D1287
Reserve alkalinity*	Report	12	D1121
Water mass %	5 max.	2.3	D1123
Color	Distinctive	Violet	-
Effect on nonmetals	No adverse effect	No adverse effect	-
Storage stability	-	5 years	-
Foam Tests	150 ml vol., max.	80 ml	D1881
	5 sec. break, max.	1.6 sec.	D1881
JIS K2234	Max. 4	Max. 4	N/A
Cavitation-erosion rating	8 min.	10	D2809

\*Reserve alkalinity (RA) is a term used to indicate the amount of alkaline inhibitors present in an antifreeze formulation. It is incorrect to relate a high RA with a high-quality antifreeze. Present state-of-the-art antifreeze formulations contain many new inhibitors which give added protection to certain metals but do not raise the RA number.

Typical ASTM Corrosion Test Results				
	Weight Loss Mg/Specimen			
Glassware Corrosion Test	Spec.	Actual	ASTM Method	
Copper	10	2	D1384	
Solder	30	1		
Brass	10	1		
Steel	10	1		
Cast iron	10	3		
Aluminum	30	0		
Simulated Service Test				
Copper	20	2	D2570	
Solder	60	4		
Brass	20	4		
Steel	20	0		
Cast iron	20	1		
Aluminum	60	1		
Hot Surface Corrosion	mg/cm <sup>2</sup> /wk			
Specimen weight loss	1.0	0.1	D4340	
Electrochemical				
Ford Pitting Test	mV min	-400	+447	FLTM BL5-1

This information only applies to products manufactured in the following location(s): USA, Canada.

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