ACDelco Dex-Cool® Longlife Antifreeze

Description

ACDelco Dex-Cool Longlife Antifreeze - is used as a cooling and heat transferring fluid in combustion engines. The heat of the internal combustion is transferred via the fluid to the radiator where the mixture is cooled by means of air flow. **ACDelco Dex-Cool Longlife Antifreeze** is an ethylene glycol based fluid that provides maintenance-free protection against *freezing and boiling* but also against *corrosion.* Extended coolant life, often for the whole life of the engine or vehicle, is obtained through the use of virtually non-depleting corrosion inhibitors.

Benefits

ACDelco Dex-Cool Longlife Antifreeze offers many benefits to the engine designer as well as to the user :

-Extended life	by synergistic combination
-Improved heat transfer	leaves more flexibility to engine design
-Reduces repairs	to thermostat, radiator and waterpump
-Reliability	depletion free and stable inhibitor
-Improved hard water stability	absence of silicates and phosphates
-Save time and money	maintenance-free coolant
-Suitable for mixed fleets	1 coolant for automotive & heavy duty application
-Environmentally friendly	by using carboxylic acids in the additive package

Based on patented *silicate-free* aliphatic acid technology, **ACDelco Dex-Cool Longlife Antifreeze** provides long-life corrosion protection for all engine metals, including aluminum and ferrous alloys. During extensive fleet testing, the synergistic combination of mono- and di-carboxylic acids present in this coolant has proven to provide protection for at least **650,000 km** (ca. 8,000 hours) in truck & bus-application or **250,000 km** (ca. 2,000 hours) for passenger cars or **32,000 hours (or 6 years)** for stationary engines. It is recommended to change the coolant every five years or at above mileages or operating times, whichever comes first.

ACDelco Dex-Cool Longlife Antifreeze provides longlife protection against all forms of corrosion by the use of optimized and patented organic corrosion inhibitors. Excellent and lasting high temperature corrosion protection is provided for the **aluminum** heat transfer surfaces contained in modern engines. The inhibitor package of **ACDelco Dex-Cool Longlife Antifreeze** offers excellent cavitation protection even without using nitrite or nitrite-based supplemental coolant additives (SCA's).

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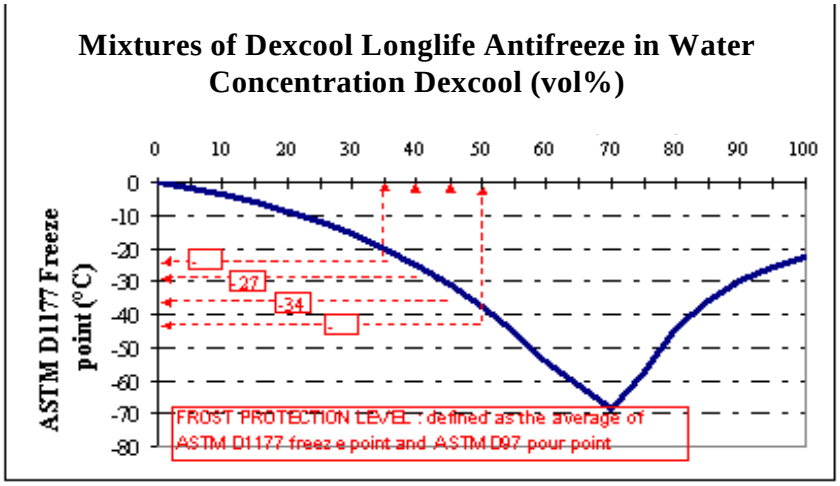
Application

ACDelco Dex-Cool Longlife Antifreeze provides long-life frost and corrosion protection. To ensure good corrosion protection it is recommended to use at least 33 vol. % of **ACDelco Dex-Cool Longlife Antifreeze** in the coolant solution. This provides frost protection to -20°C. Typical mixtures in Northern Europe are 50/50, offering frost protection down to -40°C. Mixtures with more than 70 vol. % **ACDelco Dex-Cool Longlife Antifreeze** in water are not recommended. The maximum frost protection (about -69°C) is obtained at 68 vol. % **ACDelco Dex-Cool Longlife Antifreeze**.
ACDelco Dex-Cool Longlife Antifreeze may be used with confidence in engines manufactured from cast iron, aluminum or combinations of the two metals, and in cooling systems made of aluminum or copper alloys. **ACDelco Dex-Cool Longlife Antifreeze** is particularly recommended for hi-tech engines, where high temperature aluminum protection is important. For racing cars we recommend the usage of **Dex-Cool Antifreeze Extended Life Corrosion Inhibitor**, an aqueous solution of the same carboxylic acid inhibitors.



Compatibility and Mixability

ACDelco Dex-Cool Longlife Antifreeze is compatible with most other coolants based on ethylene glycol. Exclusive use of **ACDelco Dex-Cool Longlife Antifreeze** is, however, recommended for optimum corrosion protection and sludge control. Also, the use of soft water is preferred for dilution. Though, lab testing has shown that acceptable corrosion results are still obtained with water of 20°dH, containing up to 500 ppm chlorides and 500 ppm sulfates.

Chemical and Physical Properties

	ACDelco Dex-Cool Longlife Antifreeze		ASTM D3306 requirements		Method
Ethylene glycol	93% w/w glycol		base		
Other glycols	0.5% max.		5% w/w max.		
Inhibitor content	5% w/w				
water content	5% w/w max.		5% w/w max.		ASTM D1123
Ash content	1.1 % w/w typ.		5% w/w max.		ASTM D1119
Nitrite, amine, phosphate, borate, silicate	nil				
Colour	Orange				
Specific gravity, 15°C	1.116 typ.		1.110 to 1.145		ASTM D1122
Specific gravity, 20°C	1.113 typ.				ASTM D1122
Equilibrium boiling point	180°C typ.		> 163°C		ASTM D1120
Reserve alkalinity (pH 5.5)	6.2 typ.		report		ASTM D1121
pH, 20°C	8.6 typ.				ASTM D1287
Refractive Index, 20°C	1.430 typ.				ASTM D1218
	50% dilution	**40% dilution**	**33% dilution**	**ASTM 3306**	**Method**
PH	8.6	8.4	8.3.	7.5 to 11.0	ASTM D1287
Foaming properties at 25°C Break time	50ml typ. 5 sec typ.	-	-		ASTM D1881
Foaming properties at 88°C Break time	50ml typ. 5 sec typ.		50ml typ. 5 sec typ.	150ml max.	ASTM D1881
Initial crystallization	<-37°C	<-24°C	<-18°C	<-37°C	ASTM D1177
Freezing protection	-40°C typ.	-27°C typ.	-20°C typ.		
Specific gravity, 20°C	1.068 typ.	1.056 typ.	1.053 typ.		ASTM D1122
Reserve alkalinity (pH 5.5)	3.0 typ.	2.4 typ.	2.1 typ.	-	ASTM D1121
Refraction Index, 20°C	1.385 typ.	-	1.369 typ.		ASTM D1218
Equilibrium boiling point	108°C typ.	-	104°C typ.		ASTM D1120
Effect on non-metals	no effect	no effect	no effect		GME 60 255
Staining characteristics	-	-	no effect	no effect	ASTM D1882

Hard water stability	no precipitate	-	-		VW PV 1426

Corrosion Protection

Table 1 : ASTM D1384 glassware corrosion tests

	Weight loss in mg/coupon[1]						
	Brass	**Copper**	**Solder**	**Steel**	**Cast Iron**	**Aluminium**	**AlMn**
ASTM D3306 (max)	10	10	30	10	10	30	-
ACDelco Dex-Cool Longlife Antifreeze	1.6	1.9	0.1	-0.5	-1.4	4.6	2.9

Table 2: ASTM D4340 Aluminium heat rejection test, 25%

	Weight loss in mg/cm²/week[1]
ASTM D3306 (max)	1.0
ACDelco Dex-Cool Longlife Antifreeze	<0.2

Table 3: Modified MTU High Temperature corrosion test (2000w)

	Weight loss in mg/coupon[2]					
	Cast Iron			**Aluminium**		
test duration, hrs	48	69	116	48	69	116
Reference coolant[3]						
hot coupon	-30.0	-13.1	4.3	-18.2	284.2	-
top coupon	-20.0	1.6	5.7	6.2	152.2	-
ACDelco Dex-Cool Longlife Antifreeze						
hot coupon	-0.2	-2.1	-0.5	20.2	24.6	35.1
top coupon	3.4	0.0	1.9	20.1	42.1	18.5

[1] Weight loss AFTER chemical cleaning acc. to ASTM procedure. Weight gain is indicated by a - sign.
[2] Weight loss AFTER chemical cleaning acc. to (shortened) MTU procedure. Weight gain is indicated by a - sign.
[3] Reference coolant is a conventional, high quality, silicate-based coolant

Table 4: Aging test

To emphasize the corrosion protection offered by **ACDelco Dex-Cool Longlife Antifreeze**, the aging test is conducted under more severe conditions compared to those commonly used in the industry.

Test conditions	Typical industry	ACDelco Dex-Cool Longlife Antifreeze
Test duration	169h	504h
Fluid content	5.0l	6.0l
Pressure	1.5 bar	2.5 bar
Flow	3.0 l/min	3.5 l/min
Heat input	5500 W	5000 W
Temperature in heating vessel	95°C	115°C
Temperature in cooling vessel	75°C	95°C
Concentration of coolant in water	40 vol. %	20 vol. %

	Weight loss in g/m² (using ACDelco test parameters)[1]						
	Al[2]	AlMn	Cast Iron	Steel	Cu	CuZn	Solder CB
Reference coolant[3]							
After initial cleaning	82.10	64.02	-2.19	-1.68	3.62	2.90	21.45
After final cleaning	125.01	94.33	-0.36	0.11	4.99	5.66	25.83
ACDelco Dex-Cool Longlife Antifreeze							
After initial cleaning	9.77	0.71	-0.07	0.17	1.44	1.44	0.43
After final cleaning	23.58	4.14	0.0	0.24	2.63	2.63	0.55

[1] Weight loss AFTER chemical cleaning acc. to (shortened) MTU procedure. Weight gain is indicated by a - sign.
[2] Aluminium SAE 329.
[3] Reference coolant is conventional, high quality, silicate-based coolant.

Fleet tests

ACDelco Dex-Cool Longlife Antifreeze has been extensively fleet tested for over 100,000,000 km ! 540 vehicles, both heavy duty and automotive, have been closely monitored and showed:

- limited depletion rates of the corrosion inhibitors : less than 10 % ;
- superior Aluminium protection ;
- average pump life increased by 50 % ;
- excellent cavitation protection even without the addition of nitrite ;
- no compatibility problems with good quality traditional coolants ;
- no compatibility problems with seals, hoses and plastic components.

Approvals by OEM's & National Authorities

ACDelco Dex-Cool Longlife Antifreeze has been approved by most engine manufacturers and an up-to-date approvals list is available separately. Even though some OEM's have not yet given a formal approval **ACDelco Dex-Cool Longlife Antifreeze** is suitable for use as antifreeze / coolant in any combustion engine.

Availability

ACDelco Dex-Cool Longlife Antifreeze is available in various packages with a bittering agent. Please contact your ACDelco Sales Manager on availability of packages.

Storage Requirements

The product should be stored at ambient temperatures and periods of exposure to temperatures above 35°C should be minimized. **ACDelco Dex-Cool Longlife Antifreeze** can be stored for 8 years in unopened containers without any effect on the product quality or performance. It is strongly recommended to use new containers and not recycled ones. As with any antifreeze coolant, the use of galvanised steel is not recommended for pipes or any other part of the storage/mixing installation.
The transport is not regulated. Labeling as for any MEG based coolant is required: Xn: R 22 (Harmful if swallowed) and S 2 (Keep out of reach of children).

Toxicity & Safety

For Toxicity and Safety Data we refer to the Material Safety Data Sheet.
This product should not be used to protect the inside of drinking water systems against freezing.