



Product Line Overview

NORKOOL and AMBITROL Industrial Coolants

The most trusted brands in the business



Coolants



High Performance Coolants

and Supporting Products

for the Oil & Gas Industry

A Full Range of Coolants for a Full Range of Applications

The family of industrial coolants and associated system maintenance products from The Dow Chemical Company ("DOW") sets the highest standards in the Oil & Gas Industry for quality, performance, technical expertise and service.

Whether you need an ethylene glycol (EG) or propylene glycol (PG)-based coolant, specialized corrosion inhibitors, system cleaning or degreasing agents, Dow has a product designed to meet your needs.

We have leveraged the combined Dow and Union Carbide Corporation experience of the past 50 years and now offer an unparalleled choice of industrial coolant products including two of the most recognized brand names in the industry: NORKOOL™ coolants and AMBITROL* coolants.

Choose Your Performance and/or Service Needs: NORKOOL or AMBITROL Coolants

Although similar, there are key differences in product chemistry as well as levels of service available for NORKOOL and AMBITROL coolants. These differences allow our customers to choose a fluid which best matches their specific performance and/or service level needs.

NORKOOL coolant is the premium Dow product line for Oil & Gas Industry applications and is backed by our most comprehensive analytical program and technical support resources.

Dow also offers AMBITROL coolants, which are general purpose, value-based alternatives to NORKOOL coolants.

The NORKOOL Advantage

Dow has recently reformulated its NORKOOL product line, making it *the premium heat transfer fluid for gas compression engines*.

The enhanced formulation for NORKOOL coolants now includes patented Dow anti-scaling technology in combination with our tried-and-true NORKOOL corrosion inhibitors. This makes NORKOOL coolant even more tolerant of non-purified water and helps extend service life.

Comparison of new and old allowable limits for systems operating with NORKOOL coolants

| KEY PARAMETER | OLD NORKOOL | NEW NORKOOL |
|----------------|-------------|-------------|
| Chloride | <100 ppm | <200 ppm |
| Sulfate | <250 ppm | <500 ppm |
| Total Hardness | <100 ppm | <300 ppm |

™ * Trademark of The Dow Chemical Company (DOW) or an affiliated company of Dow.



New Propylene Glycol-based NORKOOL Coolant

Customers may now choose propylene glycol-based or ethylene glycol-based NORKOOL coolants.

Dow has introduced a new propylene glycol (PG)-based coolant called NORKOOL LTC, which provides the same outstanding protection against wet sleeve liner cavitation and system corrosion as our EG-based NORKOOL SLH.

The key difference is that NORKOOL LTC is an environmentally friendly option with the low toxicity of a PG-based product. NORKOOL SLH, which is EG-based, has higher human toxicity but provides superior heat transfer and more efficient freeze protection.

New Inhibitor Warranty for NORKOOL Coolants

Dow has introduced a new inhibitor warranty program for NORKOOL coolants that is available to customers under contract with Dow or for those customers having systems containing 2,500 gallons or more of NORKOOL coolant.

Qualified customers will receive free inhibitors provided their NORKOOL coolant is installed according to our recommended guidelines and meets the following limits as tested by our analytical lab.

Maximum allowable limits for inhibitor warranty¹

| KEY PARAMETER | WARRANTY LIMITS |
|--|-----------------|
| Glycol concentration (volume %) | > 30 < 60 |
| pH | > 8.0 |
| degradation acids (ppm as C ₂ H ₆ O ₃) | < 3000 |
| chloride (ppm as Cl ⁻) | < 200 |
| sulfate (ppm as SO ₄) | < 500 |
| hardness (ppm as CaCO ₃) | < 300 |

¹Customer absorbs the cost of freight to ship inhibitors. Contact your Dow representative for further information about qualifying your coolant.



Coolant Support Services

Comprehensive Analytical Support for NORKOOL Coolant

Dow also provides free sample analysis for customers under contract or for those having systems containing 2,500 gallons or more of NORKOOL coolant.

Free sample kits include bottles, labels and a shipping box. A comprehensive report is returned to customers within two weeks of receipt, and includes a detailed analysis of fluid condition as well as recommendations on maintaining fluid integrity. Reports can be issued by email, fax or hard copy as specified by the customer.

Advantage of Calculated Corrosion Rate

A key feature of the Dow analytical report is the calculated corrosion rate which combines several fluid parameters into a single, practical indicator of on-going corrosion protection performance.

There are two main advantages to having corrosion rate listed on your fluid analysis report. First of all, corrosion rate eliminates false alarms caused by error prone metals analysis. Too often coolant samples contain suspended solids, such as weld flash or pipe scale, at sizes too small to be visibly seen but high enough to contribute to high metals

concentration. This gives a false indication of corrosion problems. Corrosion rate on the other hand is unaffected by suspended particles and gives a truer indication of the condition of your fluid.

Secondly, by utilizing corrosion rate you avoid falling into the costly trap of adding more inhibitor every time a reported concentration falls below a supplier's threshold. The potential for corrosion depends on more than just inhibitor levels. Corrosion rate helps make sure that more inhibitor is added only when your system truly stands to benefit.



NORKOOL Products

NORKOOL Ethylene Glycol-based Coolants

| Product Name | Description | Color | Freeze Point |
|---------------|--------------------------|------------|--------------|
| NORKOOL SLH | concentrate | blue-green | — |
| NORKOOL SLH50 | pre-diluted 50vol% as EG | blue-green | -34.7°F |
| NORKOOL SLH40 | pre-diluted 40vol% as EG | blue-green | -12.6°F |
| NORKOOL SLH30 | pre-diluted 30vol% as EG | blue-green | 3.7°F |

NORKOOL Propylene Glycol-based Coolants

| Product Name | Description | Color | Freeze Point |
|---------------|--------------------------|--------|--------------|
| NORKOOL LTC | concentrate | yellow | — |
| NORKOOL LTC50 | pre-diluted 50vol% as PG | yellow | -28.6°F |
| NORKOOL LTC40 | pre-diluted 40vol% as PG | yellow | -6.7°F |
| NORKOOL LTC30 | pre-diluted 30vol% as PG | yellow | 8.5°F |

NORKOOL Corrosion Inhibitors

| Product Name | Description/Application |
|-----------------------|---|
| HTF pH Booster | pH adjustment |
| HTF Copper Inhibitor | azole based re-inhibitor |
| HTF Iron Inhibitor | phosphate & azole re-inhibitor |
| NORKOOL Inhibitor 231 | phosphate, azole & nitrite based re-inhibitor |
| NORKOOL Inhibitor 234 | nitrite & azole based re-inhibitor |
| NORKOOL Inhibitor 244 | water based nitrite re-inhibitor |

NORKOOL System Cleaner & Degreaser

| Product Name | Description |
|-------------------|--|
| NORKOOL Cleaner | Mixture of chelating agents for rust and scale removal |
| NORKOOL Degreaser | Mixture of nonionic and anionic surfactants for grease removal |



AMBITROL Products

AMBITROL Ethylene Glycol-based Coolants

| Product Name | Description | Color | Freeze Point |
|---------------|--------------------------|------------|--------------|
| AMBITROL CN | concentrate | blue-green | — |
| AMBITROL FL50 | pre-diluted 50vol% as EG | pink | -34.7°F |
| AMBITROL FL40 | pre-diluted 40vol% as EG | pink | -12.6°F |
| AMBITROL FL30 | pre-diluted 30vol% as EG | pink | 3.7°F |

AMBITROL Propylene Glycol-based Coolants

| Product Name | Description | Color | Freeze Point |
|----------------|--------------------------|--------|--------------|
| AMBITROL NTC | concentrate | blue | — |
| AMBITROL NTF50 | pre-diluted 50vol% as PG | yellow | -28.6°F |
| AMBITROL NTF40 | pre-diluted 40vol% as PG | yellow | -6.7°F |
| AMBITROL NTF30 | pre-diluted 30vol% as PG | yellow | 8.4°F |

Corrosion Inhibitors

DOW™ Corrosion Inhibitors

| Product Name | Description |
|--------------------------|------------------------------|
| DOW HTF Iron Inhibitor | Phosphate-based re-inhibitor |
| DOW HTF Copper Inhibitor | Azole-based re-inhibitor |

Quality.

Reliable Supply.

Dow industrial coolants *use the highest quality materials starting with virgin glycols* which are free of the harmful contaminants found in recycled glycols.

You can count on Dow to help you maintain your coolants to provide the highest performance, the lowest maintenance, the longest life and the safest operation. Dow also strives to ensure that you have a reliable supply of coolants.

Dow has been the world's premier supplier of heat transfer fluids for more than 75 years. With back-integration to key raw materials and a broad distribution network, we're equipped to provide the most reliable supply of fluids possible.

Formulated for Demanding Oil & Gas Service Conditions

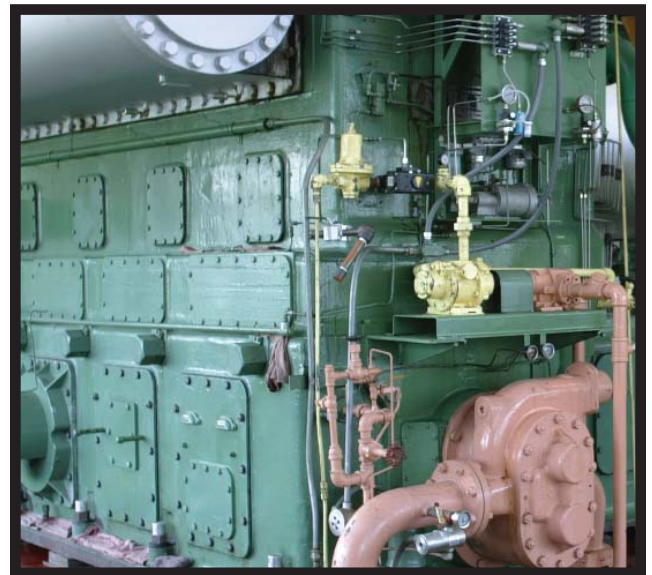
All Dow industrial coolants are formulated to provide high performance, long and dependable service life, and the favorable economics required across a broad range of applications in the Oil & Gas Industry, including...

- cooling of large stationary engines (natural gas compression)
- cooling of field compression units (natural gas gathering systems)
- natural gas line heaters
- LNG vaporizers
- well-head heaters
- combustion air pre-heaters

Total Service and Support

NORKOOL and AMBITROL coolants are supported by separate and unique service packages.

A high level of technical support is provided with NORKOOL coolants, and a more basic support package is offered with AMBITROL coolants.



**The Advantage of NORKOOL
and AMBITROL Coolants**



NORKOOL and AMBITROL coolants are available as either EG- or PG-based fluids and deliver a number of important advantages not available with other products or from other suppliers.

Outstanding Freeze and Burst Protection

NORKOOL and AMBITROL coolants offer excellent freeze and burst protection. Inhibited glycols are highly efficient at depressing the freezing point of water, the temperature at which the first ice crystal forms. These coolants also give added protection against bursting and system damage. Because water expands when it freezes and can cause catastrophic ruptures, the addition of inhibited glycol-based coolant to your system significantly reduces the expansion potential. Systems in cold weather operation should use a fluid having a freeze point 5°F below the coldest expected temperature. Those that are idle during cold weather may use a fluid concentration that provides burst protection only.

Broad Operating Range

The industrial corrosion inhibitors in NORKOOL and AMBITROL coolants — combined with Dow patented anti-scaling technology — provide superior corrosion protection of all systems made of ferrous-based and copper-based metals.



In addition, NORKOOL and AMBITROL coolants offer superior cavitation and crevice corrosion protection, especially important for protection of the cylinder liner sleeves of large industrial engines.

Comprehensive Analytical Support

Fast, accurate, comprehensive analytical service is available with NORKOOL and AMBITROL coolants, along with detailed fluid maintenance recommendations. Our laboratories feature state-of-the-art equipment and a professional staff which can reliably meet all of your analytical needs.

Expert Technical Support

Our technical experts can assist you with all your fluid selection and usage needs. From system design, to system operation or troubleshooting, nobody matches the level of service available from Dow.



To Learn More...

**For more information about NORKOOL or AMBITROL industrial coolants,
or to identify the distributor nearest you, contact Dow toll-free at:**

1-800-447-4369 (U.S. and Canada)

Or call 989-832-1560 (Other Global Areas)

www.dowcoolants.com

NOTICE: No freedom from any patent owned by Seller or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

Published September 2005



Living.
Improved daily.