

NOBURST®

-100° ANTIFREEZE/HEAT TRANSFER FLUID

*PRODUCTS TO PROTECT,
MAINTAIN AND TEST
YOUR CHILLERS, COOLERS
AND HYDRONIC OR
SOLAR HEATING SYSTEMS*

Produced
with
deionized water



PRODUCT DESCRIPTION

NOBURST is a non-toxic* antifreeze and heat transfer fluid. The product is to be used in place of water and other water-like fluids in systems where freezing may either cause damage or interfere with the functioning of systems or equipment and/or toxicity to humans or animals is a concern. NOBURST is for use in contact or potential contact with potable water.

Sizes:

- NOBURST -100 and SUPER NOBURST are available in:
- 1 gallon plastic bottles (6 per case)*
- 5 gallon plastic pails
- 30 gallon plastic drums
- 55 gallon plastic drums
- 275 gallon plastic totes
- 5000 gallon tank trucks

*SUPER NOBURST is not available in 1 gallon containers

Color:

NOBURST is reddish/pink

NOBURST Applications include:

- Hydronic heating system
- Solar heating
- Ground water and earth coupled heat pumps
- "Air hydronic" heat pumps and furnaces
- Water-based heat extraction systems
- Cooling systems and chillers
- Refrigerating systems
- Pipe tracing
- Cooling towers
- Industrial heat transfer
- Plumbing winterization
- Ice making machines
- Snow melting systems
- Fire hydrant winterization
- Cooling coil defrosting
- Immersion freezing
- Infloor heating

Ingredients:

- Active Ingredient: Propylene Glycol
- Corrosion Inhibitor: Dipotassium Phosphate
- Other Ingredients: Viscosity reduction agent
Food, Drug, and Cosmetic
Grade red dye
Deionized Water
Defoaming Agent

* "Non-toxic" is used to describe extremely low chronic and acute toxicity. No maximum safe intake for humans has been established. The product is considered GRAS (Generally Regarded As Safe) by the Food and Drug Administration.

Heat Transfer Properties:

- Specific Heat Capacity at 160°F:
100% NOBURST -100: 0.787 cal./g/°C
75% NOBURST -100: 0.870 cal./g/°C
50% NOBURST -100: 0.937 cal./g/°C
- Thermal Conductivity at 160°F:
100% NOBURST -100: 0.165 BTU/Hr-ft(2)/(F/ft)
75% NOBURST -100: 0.205 BTU/Hr-ft(2)/(F/ft)
50% NOBURST -100: 0.258 BTU/Hr-ft(2)/(F/ft)

	Relative System Efficiency ²	Thermal Conductivity BTU/HR/FT ² /F	Viscosity (Centipoises)	Foam Character	Cold Protection Level (F°)
Water	1.000	0.35	0.42	None	+32°
Noburst-100					
50%	0.930	0.270	1.00	None	-60°
75%	0.833	0.223	1.50	None	-80°
100%	0.799	0.170	2.50	None	-100°
Ethylene Glycol ³					
50%	0.896	0.237	1.40	Slight	-34°
75%	0.772	0.183	2.75	Slight	-60°
100%	0.693	0.151	5.00	Slight	+5°
Silicone					
SylTherm 444 ⁴	0.351	0.082	9.86	Slight	-121°
SylTherm 800 ⁴	0.369	0.074	5.00	Slight	-40°
Synthetic					
Hydro-Carbon ⁵	0.475	0.070	11.69	High	-40°
Terphenyl ⁶	0.409	0.0677	9.86	Very High	-20°

1. Table data obtained from Dow Chemical Company, Noble Company tests, and competitors' product literature. All comparisons (except cold protection level) are at fluid temperatures of +150°F
2. System efficiency as a function of specific heat and fluid density with no change in fluid flow rate.
3. Data is for DowTherm brand Ethylene Glycol, trademark and product of the Dow Chemical Company.
4. Syltherm is a trademark and product of Dow-Corning Corporation
5. Data is for H-30 a product of Mark Enterprises.
6. Data is for Thermal 66 Modified Terphenyl, a product of Monsanto Industrial Chemicals Company.

Chemical and Physical Properties:

- Density at 72°F:
100% NOBURST -100: 1.055
75% NOBURST -100: 1.050
50% NOBURST -100: 1.035
- Viscosity at 160°F:
100% NOBURST -100: 2.60 centipoise
75% NOBURST -100: 1.70 centipoise
50% NOBURST -100: 0.99 centipoise
- pH of NOBURST -100 solutions: 8.0 to 9.6
- Boiling Point at Atmospheric Pressure (760 mm):
100% NOBURST -100: 238°F
75% NOBURST -100: 224°F
50% NOBURST -100: 218°F
- Boiling Point at 2 Atmospheres (1520 mm):
100% NOBURST -100: 278°F
75% NOBURST -100: 251°F
50% NOBURST -100: 246°F

Freeze Protection Properties:

- Minimum “Freeze” Temperature:
100% NOBURST -100: -60°F
75% NOBURST -100: -30°F
50% NOBURST -100: 0°F
Freeze point is the temperature (°F) where the first ice crystals form.
- Minimum Fluid Flow Temperature:
100% NOBURST -100: -70°F
75% NOBURST -100: -40°F
50% NOBURST -100: -10°F
Flow point is the temperature (°F) where the solution will be slushy but still flow.
- Minimum “Burst” Temperature:
100% NOBURST -100: -100°F
75% NOBURST -100: -80°F
50% NOBURST -100: -60°F
Burst point is the temperature (°F) where the solution will actually freeze and expand, bursting the pipe.

Toxicological, Environmental, and Health Information:

- Gosselin Toxicity Index (Propylene Glycol): 1 “essentially non-toxic”
- Mean Single Lethal (Oral) Dosage: greater than one liter

FDA Reference:

- Propylene Glycol: 21 CFR 182.1666
- Dipotassium Phosphate: 21 CFR 182.6285

Both qualify as “Generally Recognized as Safe for use as Direct Food Additives”.

Flammability:

NOBURST is not flammable since it has no measurable flashpoint (Pensky-Martens Closed Cup); however, if the product comes in extended contact with open flame, it is possible it will ignite.

Material Safety Data Sheets available upon request.

Fumes:

Non-hazardous.

Environmental Hazard: LOW.

- NOBURST is not toxic to animals or plants. Spills may generally be disposed of through city sewer; however, local sewer authorities should

be contacted prior to disposal. Large spills, uncontrolled disposal, and waterway discharge should be avoided since NOBURST biodegrades rapidly, possibly depleting oxygen supply in bodies of water which can result in fish kill. All uncontrolled spills should be reported to local authorities.

- Water softeners should be disconnected from the boiler or provided with backflow protection to prevent contamination of the mineral bed.

System Requirements and Limitations:

NOBURST should not be used in systems where temperatures regularly exceed 275°F or in systems that are permanently open to the atmosphere.

Cautions for NOBURST -100 and SUPER NOBURST:

- NOBURST -100 and SUPER NOBURST will remove zinc from galvanized materials, consequently contact with galvanized materials should be minimized, use NOBURST AL. Systems constructed of aluminum will also experience corrosion with NOBURST, particularly if high temperatures (200°F +) are expected. For systems with aluminum, use NOBURST AL. All other common metals are protected from corrosion with NOBURST -100 and SUPER NOBURST.
- Should not be used in steam-type heating systems.
- Is not to be used as a coolant for internal combustion engines.
- Although existing systems require no modification, in new systems being designed for use with NOBURST the following modifications are recommended: (1) the expansion tank should be sized to allow about 4% greater expansion than for plain water in the same temperature range; (2) the pump head should be increased by 10% over the minimum requirements for those with plain water; and (3) a strainer should be installed in the return line ahead of the pump.
- A well maintained hydronic system using NOBURST should not require other treatment chemicals. NOBURST should not be used with other water treatment chemicals. Noble Company cannot test all possible combinations of chemicals for compatibility and proper performance. Although NOBURST is compatible with the leading stop-leak chemicals, we do not recommend the use of these chemicals because of their possible detrimental influence on equipment.
- NOBURST is not recommended for use with CPVC in concentrations greater than 35% (-5°F Burst Protection).

■ INSTALLATION

No matter what type of system or equipment NOBURST is to be used in, several key steps are the same:

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1. *Clean the system.* Minerals, scale, rust, and sediment can all shorten the life of your system, reduce NOBURST's effectiveness, and reduce energy efficiency.

Drain the system completely. Flush with clean fresh water, add NOBURST Precleaner, 1 pint for every 50 gallons of system capacity, and run system up to operating temperature. Allow Precleaner to circulate for approximately 24 hours to 1 week. Drain and flush with clean water.

Paradoxically, new systems are usually dirtier than currently operating systems since during construction solder, flux, grease, and other foreign materials often get into the piping. Thus, thorough cleaning is even more important on new systems.

Further, systems that have had another non-water fluid in it, such as ethylene glycol, should be cleaned particularly well so as to avoid contamination of the NOBURST with other fluid. In both cases, allow precleaner to circulate for 24 hours to 1 week.

Check the system for leaks and repair any that are found. (NOBURST may seep by some mechanical connections which are water tight. Inspect and tighten these connections if necessary.)

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2. *Measure total fluid capacity* of the system including piping, tanks, boilers, collector plates, etc. The most accurate method of measuring fluid capacity is to fill the system and then completely drain it, volumetrically measuring the fluid drained.

Piping fluid capacity may be estimated using the pipe capacity chart on our website (www.noblecompany.com). Boiler and tank capacity must either be obtained from the manufacturer of the specific piece of equipment, or through volumetric measure. Be sure all piping, collectors, and radiation is accounted for in your estimates.

3. *Determine low temperature protection* needed and corresponding NOBURST concentration to use. Calculate number of gallons of NOBURST to add to system. Allow for estimating errors when determining amount of NOBURST to use.
4. *Make sure the system is empty*, that the burner and pump are shut off, and that all zone and other valves are open so that no part of the system is isolated. Add the NOBURST and then deionized or distilled water, or pre-mix the NOBURST before adding to system.

Several techniques work especially well for introducing NOBURST into the system:

- Remove the air vent at the highest point in the system and pour NOBURST in at this point. Although cumbersome, this method helps remove air from the system.
- Remove a fitting, valve, elbow, etc., in the boiler room, but above the top of the boiler, and pour NOBURST directly into the boiler.
- Use a small pump and pump the NOBURST into the boiler through the boiler drain valve. Be sure to provide an air exit as the NOBURST is introduced.

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5. *Remove all air from* the system. Oxygen is required for corrosion to occur, so the less oxygen present, the better the corrosion resistance. Air can also reduce circulation, waste energy, and cause noise.

Air is entrapped in water and other fluids and only comes out with time, so several ventings or purgings may be necessary to have a truly airless system. Be certain to purge at all air vents in the system.

In some instances it may be helpful to add E-3 DEFOAMING agent (1 pint for every 25 gallons of system capacity) to aid in removing air.

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6. *Test the fluid* after installation and thorough mixing to insure that the proper amount of NOBURST is present. For testing reserve alkalinity and percent of NOBURST, use NOBURST Test Strips. For a more accurate test, use a hydrometer or a refractometer.

RECOMMENDED CONCENTRATIONS

Various types of fluid systems require varying amounts of NOBURST -100 to satisfy their specific requirements. Here are the minimums:

- Hot Water Hydronic:
A minimum NOBURST -100 concentration of 50% is required to maintain adequate corrosion protection for the long-term and to provide reasonable low temperature fluid flow characteristics.

We recommend a maximum of 75% NOBURST -100 in hydronic systems unless specifically designed for fluids other than water.
- Ground-Water and Earth-Coupled Heat Pumps
Generally, antifreeze is used in these types of systems to allow fluid flow down to +10 to +20°F. Burst protection and other factors are quite secondary. In this case, use 30% NOBURST -100.
- Coil Defrosting:
Use 50% to 75% NOBURST -100.
- Industrial Uses:
The concentration of NOBURST -100 will depend on the application, of course, but generally 50% to 75% NOBURST should be used.
- Fire Hydrant:
Use 75% to 100% NOBURST -100.
- Solar:
A minimum NOBURST -100 concentration of 65% is recommended, and most solar systems will perform well with 100% NOBURST. Since solar systems generally have harsher operating conditions (very high to very low temperature swings, stagnation, high pump heads), these factors, particularly the maximum operating temperature, should be taken into account when NOBURST concentration is calculated.

AVAILABILITY

NOBURST is available throughout the U.S. through heating and plumbing wholesalers. Factory representatives cover all fifty states. Please contact Noble Company for your local representative and wholesalers.

MAINTENANCE

Systems with NOBURST installed should be tested at least annually for adequate NOBURST concentration and corrosion inhibitor protection level. If NOBURST concentration is low, add NOBURST according to this formula:

Formula to Increase NOBURST Concentration

Example:

- 400 Gallon Capacity
- 75% NOBURST Desired
- 50% NOBURST currently in system
- 100% NOBURST in a NOBURST container

- Step 1: 75 minus 50 = 25 (Desired – Current)
- Step 2: 100 minus 50 = 50 (100% NOBURST – Current)
- Step 3: 400 x 25 = 10,000 (Capacity x Desired – Current)
- Step 4: 10,000 divided by 50 = 200

Conclusion:

200 gallons of NOBURST -100 must be added to the 200 gallons of 50% solution currently in the system to reach a 75% total solution.

Before adding additional NOBURST, drain adequate fluid from the system so that when the new NOBURST is added, the operating pressure will not be too high.

If the corrosion inhibitor tests low, add one pint of NOBURST Inhibitor Boost per 20 gallons of fluid capacity of the system. If the total system capacity is less than 20 gallons, use one pint. If after Inhibitor Boost addition and thorough system mixing the corrosion inhibitor still tests low, add another pint per 20 gallons system capacity. If after this addition the inhibitor still tests low, the system has been contaminated with minerals or an acidic chemical. The system should be drained, cleaned, and recharged with fresh NOBURST.

TECHNICAL SUPPORT

Specifications, installation design, installation techniques, and unique applications will be reviewed upon request. Address inquiries ATTN: NOBURST Technical Support.

Field service is available through factory representatives and Noble Company staff. Contact Noble Company for local representatives.



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Additional product information is available 24 hours a day,
7 days a week at www.noblecompany.com or by calling Fast Fax,
our automated Fax Back System (1-800-272-1519).

PRODUCT NAME

NOBURST -100 Non-Toxic* Antifreeze
and heat transfer fluid

SUPER NOBURST – Concentrated version of NOBURST
with the same inhibitor package.

Associated Products:

- NOBURST System Precleaner
- NOBURST Inhibitor Boost
- NOBURST Test Kit
- NOBURST E-3 Defoaming Agent
- Hydrometer
- View Through Refractometer
- Digital Refractometer

Literature and Supplies:

- NOBURST Product Information Guide (this item)
- NOBURST Poster
- NOBURST Material Handling Safety/Data Sheet
- NOBURST Boiler Tags

® Indicates a registered trademark of Noble Company.

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