

"ANTI-HYDRO[®]"-NC

For Placing Masonry in Cold Weather Conditions

Rev. 06/15



ANTI-HYDRO INTERNATIONAL, INC.

Concrete and Masonry Products and Problem Solving Worldwide Since 1904

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DESCRIPTION:

"ANTI-HYDRO[®]"-NC, a non-chloride admixture is extensively recommended and has been widely used over many decades to safely place masonry in cold weather conditions, generally in temperatures below 40°F. In cold weather, it accelerates the set times and often eliminates the need for externally applied heat. "ANTI-HYDRO[®]"-NC produces high strength, durable, non-dusting, water and damp-proofed concrete, inside and outside, below and above grade. It improves workability and reduces shrinkage and cracking.

"ANTI-HYDRO[®]"-NC has been used successfully by contractors and engineers in placing masonry under adverse temperature conditions in thousands of jobs as one of the measures to protect concrete from damages.

"ANTI-HYDRO[®]"-NC is a set-accelerating, non-chloride solution of organic and inorganic chemicals that reacts with portland cement to produce more complete hydration. The increased hydration utilizes more of the mixing water and liberates additional heat of hydration over a shorter time, often eliminating the need for externally applied heat and is extremely helpful in the development of initial set and high early strengths at low temperatures thus affording early access to masonry installations. The increased hydration provides internal curing and a much denser, harder and tougher cement paste that binds the aggregates together. Water requirements, bleed water, capillaries and shrinkage are reduced. "ANTI-HYDRO[®]"-NC is suitable for potable water and subsequent finishing applications.

SPECIFICATIONS:

In cold weather conditions, all masonry, as indicated on plans and specifications, shall be placed and protected against damages using "ANTI-HYDRO[®]"-NC admixture, as manufactured by Anti-Hydro International, Inc., in strict accordance with manufacturer's specifications. *Refer to our [Waterproofing Systems Design Considerations](#) <- (click me [Tech. Bulletin W-1-1](#)) and [Waterproofing & Industrial Floor Details](#). <- (click me)*

RECOMMENDATIONS FOR GOOD COLD WEATHER MORTAR PRODUCING:

1. Mortar may be safely placed in cold weather if necessary precautions are taken. Early development of approximately 500 psi in the concrete will prevent damage due to early freezing. Tests indicate that mortar containing "ANTI-HYDRO[®]"-NC will attain such strengths in less than 12 hours before freezing which prevents mdaage due to frost action.
2. The use of "ANTI-HYDRO[®]"-NC economically provides increased workability and lower water requirements. "ANTI-HYDRO[®]"-NC increases the rate of and the percentage of cement hydration. "ANTI-

-HYDRO[®]"-NC enhances internal curing by increasing the amount of cement hydration, produces high early strength which prevents damage due to frost action. "ANTI-HYDRO[®]"-NC will not affect the color of the mortar. ANTI-HYDRO[®]"-NC will not cause efflorescence.

3. The warmer the aggregates, water and masonry units, the more rapid will be the development of strength and the greater cold weather protection. Do not use frozen sand. The maximum temperatures of the mixing water should be 150°F.
4. A lower amount of water used in a given mix will increase the rate of hydration and provide better cold weather protection.
5. Higher ambient temperatures require less protection. The more efficient the wind barriers, the lower the heat losses.
6. On windy days, erect wind barriers to prevent rapid heat losses. Cover all masonry at the end of the work day to prevent water saturation from rain.
7. Prevent gases from heating devices from impinging on fresh mortar. Carbonation results in soft, weak mortars.
8. The higher the portland cement content of the mortar, the greater amount of heat produced. The more heat produced, the greater cold weather protection.

Masonry Mortars, Stucco and Plaster-

Mortars shall conform to the requirements of Type "M" or Type "S" (ASTM C-270). Use Type 1 or Type 2 portland cement with no more than 25% lime (1 part portland cement plus 1/4 part lime to 3 parts clean, sharp sand conforming ASTM C-144).

Addition of "ANTI-HYDRO[®]"-NC to the mixing water shall be done as shown in ESTIMATOR'S DATA GUIDE, based on the lowest temperature in the 24 hours period following installation, including wind chill factor. All parts are measured by volume. Increase dosage of "ANTI-HYDRO[®]"-NC if quicker set is desired.

Mortar dosage rates in ESTIMATOR'S DATA GUIDE are based on the lowest temperature in the 24 hours period following installation, including wind chill factor. ACI 306 "Recommended Practice for Cold Weather Concreting" shall be followed when air temperatures are below 50°F. Control joint spacing should be as recommended in ACI Standard 302-3.2.5, Concrete Floor and Slab Construction. *Refer to our [Waterproofing & Industrial Floor Details](#). <- (click me)*

PRECAUTIONS:

Installation-

Testing for set time is recommended before use as a result of recent globalization of cement sources.

"ANTI-HYDRO[®]"-NC conforms to the requirements of ACI 318-4.4.1 and ACI 318-3.6.3. However, **DO NOT** use "ANTI-HYDRO[®]"-NC in **pre-stress or post-tension applications.**

Where job specifications require, "[ANTI-HYDRO®](#)" <-click me Spec.8-2) may be

substituted for "ANTI-HYDRO®"-NC.

Safety-

Use approved safety goggles, rubber gloves, coveralls and work boots. Protect animals, vegetation and food items. Refer to the product Material Safety Data Sheet (MSDS) for details.

Storage-

Store in a dry, cool location. Keep containers tightly closed. KEEP AWAY FROM CHILDREN. Refer to the MSDS for details

TYPICAL PROPERTIES/PERFORMANCE DATA:

Concrete/mortar specimens, with "ANTI-HYDRO®"-NC, exhibited the same performance as "ANTI-HYDRO®" tested by various independent laboratories as follows:

- **Impermeability/Waterproofing-** Impermeable¹ at 20 psi (46' head of water).²
- **Vapor Transmission/Dampproofing-** Produced 85% reduction in transmission of vapor.⁹
- **ACI 318/Non-Corrosive-** Greatly exceed the requirements (non-corrosive).^{1,12} No sign of steel corrosion in concrete with "ANTI-HYDRO®".¹
- **Durability-** Highest durability (over a 15 year, freeze/thaw, durability test) of any material tested.³
- **Integral Curing-** Concrete cured internally, survived durability tests of 719 freezing-thawing cycles without any damage.¹⁴
- **Acceleration-** High range accelerator.^{1,13} 30% reduction in concrete setting times at 32°F.⁵
- **High Strength/Compressive Strength-** Concrete showed compressive strength significantly higher at all ages.^{4,6} Concrete exhibited 27% increase in 3 days and 23% in 7 days.⁵ Mortar exhibited 14% increase in 1 day, 11% in 3 days and 12% in 7 days.⁷
- **Bonding Shear Strength-** Poured topping with "ANTI-HYDRO®" bonded as an integral part of the old floor slab and the bond found to be stronger than the original concrete.⁶ (Double the bond strength).^{1,8}
- **Tensile Shear Strength-** Bonded to old concrete, in all cases, the failure occurred in the old concrete, and no failure occurred in the bond.¹¹
- **Abrasion Resistance-** Produced 85% increase in abrasion resistance.¹⁰
- **Shrinkage Reduction-** 20-25% reduction in shrinkage.⁶
- **Plasticity-** Produced a 29% increase in plasticity.⁶
- **ASTM Specification-** Meets ASTM C-494, Types A, C & E

* The above laboratory results may vary dependent on real or field conditions.

Test References:

1. Bulletin of the Board of Standards and Appeals, City of New York, Vol. XXVIII, No. 21.
2. US Department of Commerce, Bureau of Standards Tests of Integral and Surface Waterproofings for Concrete, Research Paper No. 394 (20 psi - 46' Head of Water).
3. US Army Corps of Engineers, Report No. 5, Technical Memorandum No. 6-226 - 15 Year Freeze/Thaw Test.
4. W. R. MacIntosh, C. E., University of Louisville Louisville, KY.
5. Shimel and Sor Testing Laboratories, Inc. Report No. 90-6515.
6. War Department, United States Engineer Office.
7. Fairway Testing Co., Sports Complex Building, West Point, NY.
8. Raymond G. Osborne, Bureau of Tests & Inspection Los Angeles.
9. Shimel and Sor Testing Laboratories, Inc. Report No. 88-2114.
10. Pittsburgh Testing Laboratory - 7512545A/3Y-3160-S.
11. Smith-Emery Company - P-28318, Los Angeles.
12. Shimel and Sor Testing Laboratories, Inc. Report No. 84-273 R

13. Herman G. Protze, Materials Technologist, Highlands, MA
14. War Department, Corps of Engineers, Mississippi River Commission Technical Memorandum No. 6-226

MAINTENANCE:

All due diligence must be exercised to provide a regular and frequent maintenance plan to clean and protect the finished surface from severe or prolonged assault from chemical attack, abrasive attack or similar abuse.

PACKAGING:

1-quart, 1-gallon, 5-gallon, 55-gallon or 220-gallon containers.

SERVICES:

Our technical staff is available to review product selection and detailing during the design stage, provide proper field guidance during the installation stage, evaluate concrete construction problems on-site and make recommendations.

ESTIMATOR'S DATA GUIDE:

Protect cement mortars against freezing, for anticipated outside air temperatures, and wind chill conditions.

<u>Temperature Range</u>	<u>Required "ANTI-HYDRO®"-NC and water mix</u>
From 32° to 25°F:	1 part "ANTI-HYDRO®"-NC with 12 parts water.
From 24° to 15°F:	1 part "ANTI-HYDRO®"-NC with 10 parts water.
14°F or Less:	Mechanical heating is necessary.

To protect masonry cement or lime mortars at temperatures as low as 25°F, use 1 part "ANTI-HYDRO®"-NC with 10 parts water.

WARRANTY: Anti-Hydro International, Inc. (Anti-Hydro) warrants its products to be free of manufacturing defects at the time of delivery to its customer and will, at its option, replace or refund the invoiced price of any materials proven to be defective. This limited warranty is in lieu of any other warranty or guarantee, expressed or implied, including warranties of merchantability and fitness for a particular purpose. Anti-Hydro disclaims liability for any incidental, consequential, or other damages, including but not limited to, loss of profits or damages to a structure or its contents, arising under any theory of law whatsoever beyond the invoiced price of the material to its customer.

To the best of our knowledge, the information contained herein is accurate. However Anti-Hydro International, Inc. does not assume liability whatsoever for the accuracy or completeness of information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present known or unknown hazards, please refer to the Material Safety Data Sheet (MSDS) for this product. This notification may not be detached from the specification. Any copying and redistribution of the specification shall also include copying and redistribution of this notice. Our sales persons or representatives, distributors and their personnel have no authority to change the recommendations contained herein.