

Why Gilsulate? Solutions to Current Challenges

• ELIMINATE EXCESSIVE HEAT LOSS/GAIN WITH GILSULATE INSULATION •

Gilsulate Insulation is often used to protect electrical utilities from the excessive heat loss of existing DDT systems. Gilsulate Insulation System provides a more energy efficient system than DDT, therefore providing a positive operating energy cost savings.

"...we find that heat losses cost the Army around \$85 Million per year."(1) "The Department of Defense maintains and operates approximately 6,000 mi of steam and hot water heat distribution system piping, mostly underground. Even a small decrease in heat transmission efficiency could waste large amounts of energy, natural resources & lead to increased greenhouse gas production."(2)

• REDUCE MAINTENANCE COSTS WITH GILSULATE INSULATION •

Gilsulate Insulation saves on maintenance costs. The seamless Gilsulate System requires no holiday testing, no costly sacrificial anodes and no draining/drying.

"For the Army's 1992 fiscal year the annual maintenance costs were over \$24 million (U.S. Army 1992). This does not include any of the larger replacement projects. In addition, as will be shown later, the cost of heat loss is much greater."(1) "Such problems are evident even along newer (less than 15 years old) sections of the system. The result has been large energy losses and significant repair costs. Reductions in the maintenance staff and budget at APG have contributed further to the problem."(3)

• GILSULATE INSULATION PROVIDES STABLE NON-CORROSIVE ENVIRONMENT •

Gilsulate Insulation System offers a hydrophobic and stable environment for metallic pipes with resistivity greater than 1,400,000,000 ohm-cm, isolating and protecting them from corrosion

"Army guidance requires that underground heat distribution piping in ferrous metallic conduit is to be cathodically protected in soils with resistivity of 30,000 ohm-cm and less" "Heat distribution systems are extremely vulnerable to deterioration and premature failure due to corrosion." "The outside surface of underground steel conduits can be corroded rapidly by aggressive soils."(3)

• EXTEND SYSTEM LIFE AND REDUCE PREMATURE REPLACEMENT RATES •

Gilsulate Insulation System has the proven record of long-term reliability; a successful alternative to DDT. Gilsulate is used to isolate field applied joints of DDT systems to prevent water intrusion and also used to repair failed DDT systems.

"Although moisture should not normally exist in the annulus between the carrier pipes and the conduits, wet insulation is a relatively common occurrence in Army heat distribution systems."(3) "A wet or damp insulation's efficiency is reduced by 70% with just a 4% moisture by volume. The presence of moisture will allow thermal conductivity (K) at a much greater rate."(4)

Footnotes:

(1) Phetteplace, Gary (September 1995). Efficiency of Steam and Hot Water Heat Distribution Systems. CRREL Reports

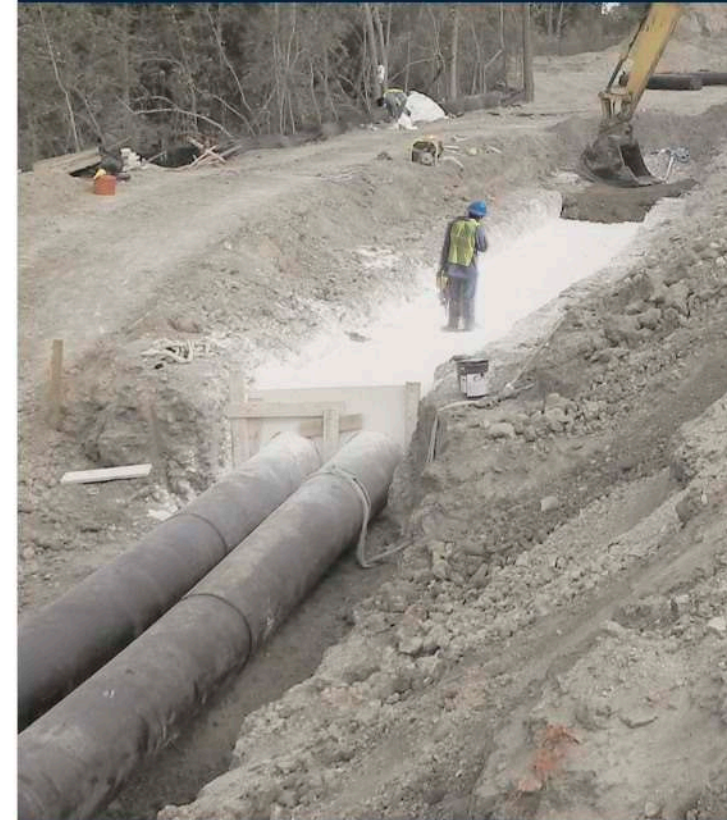
(2) Marsh, Charles; Demetroulis, Nicholas; Carnahan, (July 1996) Investigation of Preapproved Underground Heat Distribution Systems. USACERL Technical Report

(3) Van Blaricum, Vicki; Marsh, Charles; Hook, Vincent, (May 1995) Thermal Energy Supply Optimization for Aberdeen Proving Ground-Edgewood Area. USACERL Technical Report

(4) Herb Moak - I.E. Dupont

SAVE ENERGY AND MAINTENANCE COSTS

Meets & Exceeds UFGS 33 61 13



Raw Carrier Pipe & Patented

Gilsulate® 500_{XR}



Gilsulate
International
Incorporated

INCLUDE GILSULATE®500XR INSULATION SYSTEM AS YOUR ALTERNATE ON YOUR NEXT UNDERGROUND SYSTEM

GILSULATE INTERNATIONAL, INC

- Small Business
- Woman Owned & Operated Business
- Proprietors of the Patent Gilsulate®500XR
- Manufacturer of the product Gilsulate®500XR
- Gilsulate®500XR Proudly made only in the U.S.A.
- System provides opportunities to source multiple trades including Small Businesses
- System provides opportunities to source local economies including Small Businesses

BASIS FOR INVENTION/ PATENT OF GILSULATE®500XR

Underground Pipe/Tank Insulation & Corrosion Protection System

- Gilsulate®500XR (Patent 4,231,884)
- Improved Thermal Insulation
- Corrosion Protection to Metal Components
- Excellent Load Bearing Properties
- Resistance To Water Penetration
- For Underground Structures
- Low Density Material

SUPERIOR QUALITY

- 70 Year System Design Details
- Meets & Exceeds U.S. Military Standards (UFGS 33.61.13)
- Meets ASTM Industry Standards & 3rd Party Lab Tests
- Warrantied For Use & Application

CODES AND STANDARDS - PHYSICAL PROPERTIES

American Society for Testing and Materials (ASTM)

- 1 ASTM C177-04 Thermal Conductivity (tested @ use density):
K = 0.53 Btu/hr.ft2 °F/in. @ 100°F
K = 0.60 Btu/hr.ft2 °F/in. @ 175°F
K = 0.65 Btu/hr.ft2 °F/in. @ 300°F
- 2 ASTM D1895A - Bulk Density Cubic Foot
30-34 lbs./ft3
- 3 ASTM D1895C Load Bearing
12,000 lbs./ft2
- 4 ASTM D1895C (400 lbs.) - Installed - Compacted Density Cubic Foot
40-42 lbs./ft3 CFUD (Use Density)
- 5 ASTM D1895C (400 lbs.)
Percent of compaction of installed density under static load. Shall not exceed more than 1% compaction
- 6 USCS (Unified Soil Classification System) well-graded particle sizing
Diameter ranging from 1mm to sub-micron sizes
Underground product must consist of well-graded, multi-sized and shaped particles and be dimensionally stable. Underground product must be able to self-support the weight of a man prior to any backfill.
- 7 System Temperature Range:
35°F to 800°F
800°F+ Composite System
- 8 Electrical Resistivity:
Greater than 10 to the 12th Ohm-cm
- 9 Long Term Water Retardency Test:
Passage of 3rd party conducted lab test greater than 30 days withstanding moisture penetration.
- 10 Warranty: Submit manufacturer published warranty as designed for the specific purpose for use in load bearing underground installations and as a thermal insulation and corrosion protection product.
- 11 Manufacturer's Design & Installation Manual and Instructions

Gilsulate®500XR

GILSULATE SYSTEM BENEFITS

- | | |
|----------|---------------------------------------|
| REDUCE | •Up-Front Construction Costs |
| SAVE | •Ongoing Operational Energy Costs |
| SAVE | •On-going MAINTENANCE Costs |
| EXTEND | •Underground Distribution System Life |
| SIMPLIFY | •All in One Product |
| EXCEEDS | •Energy UFGS Requirements |

CONTACT INFORMATION

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A key factor in selecting a reliable insulation and protection system for critical utilities is initial installed cost. Today's tight budgets demand it and Gilsulate®500XR meets this criterion. Initial installation cost is among the lowest of the products available today. This low first cost and reduced energy saving cost due to its excellent insulating properties result in short-term payback periods.

We would enjoy the opportunity to provide you a cost effective, efficient and long term solution for your next underground piping project or repair.