



June 24, 2022

Thermal Dynamics
Attn: Jeff Walton
5115 Industrial St.
Maple Plain, MN 55359
Phone: 952-255-7080
Fax:

RE: Thermal Grout Thermal Conductivity Analysis Report

Thank you for participating in this "field quality control" program for the various Thermal Grout products. The objective of this analysis is to offer an unbiased verification of the thermal conductivity of the field mixed material. This analysis is intended to help ensure proper performance of the grouting material and that proper mixing procedures are consistently being followed throughout the project. It is recommended that, at a minimum, three separate analyses be performed on each commercial project.

Based on information supplied on the "Test Information Form" that accompanied the sample container, the tested specimen was collected on the following date from the following project:

Sample Received by Lab: June 22, 2022
Sample Collection Date: June 15, 2022
Project Name: MN Veterans Home (Group 6A, Sample 1)
City, State: Bemidji, MN

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **0.926** Btu/hr-ft-°F = 1.603 W/m-°K

If this value is lower than expected, please contact GeoPro, Inc. immediately at (605) 542-7391 to discuss possible reasons for a discrepancy and possible remedies.

We at GeoPro, Inc. believe that our combined efforts to provide this project with a high quality, high performance grouting material helps to build confidence in ground-source heat pump applications. We believe that increased confidence by all parties involved will help this industry achieve its objective of becoming a "main-stream" technology. Again, thank you for your participation in this program.

If you have any questions regarding this analysis, please contact me at (877) 580-9348 ext 106.

Sincerely,

A handwritten signature in black ink, appearing to read "Tyler Harbeck". The signature is written in a cursive, flowing style.

Tyler Harbeck
GeoPro, Inc.



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Based on information supplied on the "Test Information Form" that accompanied the sample container, the tested specimen was collected on the following date from the following project:

Sample Received by Lab: June 22, 2022
Sample Collection Date: June 15, 2022
Project Name: MN Veterans Home (Group 6A, Sample 2)
City, State: Bemidji, MN

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **0.894** Btu/hr-ft-°F = 1.549 W/m-°K

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Based on information supplied on the "Test Information Form" that accompanied the sample container, the tested specimen was collected on the following date from the following project:

Sample Received by Lab: June 22, 2022
Sample Collection Date: June 15, 2022
Project Name: MN Veterans Home (Group 6A, Sample 3)
City, State: Bemidji, MN

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **0.836** Btu/hr-ft-°F = 1.446 W/m-°K

If this value is lower than expected, please contact GeoPro, Inc. immediately at (605) 542-7391 to discuss possible reasons for a discrepancy and possible remedies.

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July 19, 2022

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Based on information supplied on the "Test Information Form" that accompanied the sample container, the tested specimen was collected on the following date from the following project:

Sample Received by Lab: July 15, 2022
Sample Collection Date: July 7, 2022
Project Name: MN Veterans Home (BH 24)
City, State: Bemidji, MN

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **0.923** Btu/hr-ft-°F = 1.597 W/m-°K

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August 12, 2022

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Based on information supplied on the "Test Information Form" that accompanied the sample container, the tested specimen was collected on the following date from the following project:

Sample Received by Lab: August 9, 2022
Sample Collection Date: August 2, 2022
Project Name: MN Veterans Home (BH 42)
City, State: Bemidji, MN

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **0.883** Btu/hr-ft-°F = 1.528 W/m-°K

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Project Name: MN Veterans Home (BH 42)
City, State: Bemidji, MN

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **0.930** Btu/hr-ft-°F = 1.610 W/m-°K

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Thermal Conductivity: **0.881** Btu/hr-ft-°F = 1.525 W/m-°K

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Sample Received by Lab: July 15, 2022
Sample Collection Date: July 7, 2022
Project Name: MN Veterans Home (BH 24)
City, State: Bemidji, MN

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **0.889** Btu/hr-ft-°F = 1.539 W/m-°K

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