



ANALYSIS REPORT
SCC Accreditation No.: 40‡

Mr Dave Martin
Quantum Group of Companies

Date: December 17, 2014
 Report: S1277-010-77729C

IDENTIFICATION: ECS Polyurea Geomembrane: At -40°C, At -30°C, At -20°C, At -10°C, At 0°C, At 10°C, At 20°C, At 30°C, At 40°C, At 50°C, At 60°C, At 70°C, At 80°C, At 90°C, At 100°C

Received: November 19, 2014

STANDARD:

TEST: Cold Temperature Crack Resistance CAN/ULC-S668-12 § 5.7

TEST CONDITIONS: As requested by CAN/ULC-S668-12, tested according ASTM D751-06, Sect61-64.1;
 Conditioned sample(s) (21°C, 65 % R.H.);
 Exposure time: minimum 4 hours
 Number of test specimens: 3
 Tested November 24 to December 11, 2014

RESULTS: Individual Data

At -40°C

Failure (yes/no): no no no

At -30°C

Failure (yes/no): no no no

At -20°C

Failure (yes/no): no no no

At -10°C


Failure (yes/no): no no no

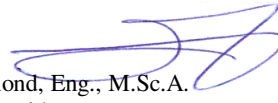
At 0°C

Failure (yes/no): no no no

At 10°C

Failure (yes/no): no no no

Prepared by:

 Catherine Groleau Rivard, Tech.
 Technician

Approved by:

 Eric Blond, Eng., M.Sc.A.
 Vice-President

Date: December 17, 2014

****For any information concerning this report, please contact Eric Blond****

The reports are identified by an alphanumeric code, the last character refers to the number of revision(s), this is emitted in ascending order. The samples in relation to this test are retained for a period of 30 days following the expedition day of the written report, unless other instructions are received. The fees for all services after the tests are 125.00 \$ per hour and for appraisal in Court, 195.00\$ per hour. The above reported results refer exclusively to the samples submitted for evaluation. This analysis report cannot be partly used or reproduced, unless in whole, without CTT Group prior written consent. ‡ CTT Group is accredited by the SCC for specific tests as listed on www.scc.ca. For customer's complete address, please refer to the front page.



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RESULTS (CONT): Individual Data

At 20°C

Failure (yes/no): no no no

At 30°C

Failure (yes/no): no no no

At 40°C

Failure (yes/no): no no no

At 50°C

Failure (yes/no): no no no

At 60°C

Failure (yes/no): no no no

At 70°C

Failure (yes/no): no no no

At 80°C

Failure (yes/no): no no no

At 90°C

Failure (yes/no): no no no

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STANDARD:

TEST: Cold Temperature Crack Resistance

CAN/ULC-S668-12 § 5.7

RESULTS (CONT):

Individual Data

At 100°C

Failure (yes/no): no no no

REQUIREMENTS: As per CAN/ULC-S668-12 § 5.7.1, secondary containment liners shall withstand folding without failure.

REMARKS:

- The sample was folded with the rough (exterior) surface located inside, and the smooth (facing the substrate) surface located outside of the fold.
- A change of appearance of the rough surface was observed in the fold when testing at temperatures of 90°C and 100°C.
- The weight of the roller was not sufficient to fold completely the sample at temperatures of -40°C, -30°C and -20°C.

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