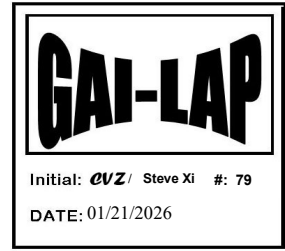


Jan 21st, 2026

Yan Tao

Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司
Workshop 1, New material R&D and Production Project, No. 3777,
Longteng Road, Beijipo Sub-District Office,
Gaoxin District, Tai 'an, Shandong



Re: PARTIAL LABORATORY TEST REPORT 中期实验室检测报告

Dear Mr. Yan:

Thank you for consulting TRI Suzhou for your material testing needs.

感谢选用 TRI 苏州实验室为您检测材料

Enclosed is the **partial** laboratory report for the **Conformance** testing of **one (1) Geocell sample**.

附上一份 1 个土工格室样品的最终符合性实验室检测报告

PROJECT NAME 项目名称: Geocell Testing

DATE REPORTED 报告日期: Jan 21st, 2026

REFERENCE TRI JOB NO. 涉及工作编号: SCH25251

DATE RECEIVED 接收日期: Aug 28th, 2025

SAMPLE(S) SENT BY 送样人: Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司

SAMPLE IDENTIFICATIONS 样品信息:

SAMPLE ID 样品 ID
Geocell

TRI CONTROL NUMBER 受控编号
13441

TESTS REQUIRED / PERFORMED 检测需求/检毕:

TEST METHOD 检测方法

1. ASTM D5199
2. ASTM D5994
3. ASTM D1505
4. EN 12224
5. ISO 13438
6. ISO 527
7. ASTM D5885
8. ASTM D1603
9. ASTM D751
10. ISO 13426-1
11. ASTM D1693

DESCRIPTION 描述

- Thickness 厚度
- Core Thickness 核心厚度
- Density 密度
- UV Resistance 抗紫外老化
- Oxidation Resistance 抗氧化性能
- Tensile Property 拉伸性能
- HPOIT 高压氧化诱导
- Carbon Black Content 炭黑含量
- Seam Shear Strength 剪切强度
- Peeling Strength 剥离强度
- ESCR 耐环境应力开裂

TEST RESULTS 检测结果: The test results are summarized in the attached Table(s) 1. 检测结果参见附表 1.

Note: The general conditioning and testing of material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e. 21±2°C and 65±5RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

注意: 本报告中所提及的材料样本的一般性处理和测试均在实验室环境条件下进行, 即温度 21±2°C, 相对湿度 65±5%。否则, 实际环境条件会在相应的测试方法报告中予以说明。

Respectfully,此致

TRI Geosynthetic Testing and Services (Suzhou) Co., Ltd.
苏州缙尔埃土工材料检测服务有限公司



Steve Xi
Quality Assurance



Chad Blackwell
General Manager

Signatures are on file



TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

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It shall be noted that the **sample/s** tested **is/are** believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from the client or any pertinent entity duly authorized by the respective client. It is our policy to keep physical records of each job for five (5) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

需说明的是，所送检样品会被认为是根据设计所生产材料的真实代表。另外，所附实验室检测结果仅表明所检测样品质量。此次合适的检测方法的采用是根据目前通用行业实际情况。TRI 既不对样品接受负责也不对材料的最终使用目的及用途发表声明。检测数据及相关项目信息为商业秘密，不得复制，非经客户书面同意或授权同意不得外泄给其他机构。我司自接收样品日起保存纸质记录 5 年，保存相应电子记录 7 年。样品留存 1 个月废弃。如需保存更长时间，请以书面方式提前通知

8 Pages Total (including this sheet)

TABLE 1.
MATERIAL PROPERTIES

材料属性

CLIENT客户: Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司
PROJECT项目: Geocell Testing

Date Received接收日期: **2025.08.28**
Date Reported报告日期: **2026.01.21**
Client Sample ID样品编号: **Geocell**
Material Description材料描述: **Geocell**

QC'd By质量担当: *Steve/姜心恩*
TRI Job No.工作编号: **SCH25251**
TRI Control No.受控编号: **13441**

SPECIMENS样品

	1	2	3	4	5	6	7	8	9	10	Avg. 平均值	Std. Dev. 标准偏差	Min 最小值	Max 最大值
METHOD	DESCRIPTION													
ASTM D5199	Thickness 厚度 (mm) <i>Modified for Textured</i> Apparatus: Dead weight dial micrometer with 6.35mm (0.250in) dia presser foot and a pressure of 20 kPA (2.9 psi) 仪器: 测微计带6.35mm直径的压脚, 并由65.8g~509g重的压脚提供20kPA压力 provided by a 65.8gm - 658gm weight. Loading time: 5 sec Specimen Size: 4" x 4" 负载时间: 5秒 样品尺寸: 101.6mm×101.6mm													
	1.76	1.75	1.76	1.77	1.78	1.76	1.78	1.76	1.75	1.76	1.76	0.01	1.75	1.78
ASTM D5994	Thickness 厚度 (mm) Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2 to the horizontal with the tip 仪器: 带压脚的测微计, 带锥形测量点, 角度为60° +/- 2. 顶端在水平面大小为半径 0.8+/-0.1mm (0.031+/-0.004in) rounded to a radius of 0.8+/-0.1mm (0.031+/-0.004in), with a specified force of 0.56+/-0.05N (2+/-0.2oz) 附带一个大小为0.56+/-0.05N (2+/-0.2oz) 指定的力 Loading Time 装载时间: 5sec Specimen Size 样品尺寸: 4" x 4"													
	1.02	1.03	1.02	1.01	1.02	1.03	1.03	1.02	1.03	1.03	1.03	0.01	1.01	1.03
ASTM D1505	Density 密度 (grams/ cm. ³)													
	0.9430	0.9421	0.9418								0.9423	0.0006	0.9418	0.9430
ASTM D1603	Carbon Black Content/炭黑含量 (百分率percent)													
	2.45	2.39								2.42	0.04	2.39	2.45	
ASTM D5885**	High Pressure Oxidative Induction Time/高压氧化诱导时间 (min分钟) One (1) specimen was prepared in accordance with this standard. The specimen was obtained in the middle section of the sample, weighed and placed in a Tzero aluminum pan then heated from 40°C to 150°C with a heat rate of 20°C/min in 按照标准取一个样品, 样品从中间部分取得, 并称重放置在铝盘中加热从40度到150度速率为每分钟20度。在流动氮气中 oxygen atmosphere (300 psi (2MPa)) and held for 5 min. Atmosphere is held isothermally at 150°C until exothermic peak is detected. (300 psi (2MPa)) 进行并保持5分钟, 当保持在150度等温时切换到氧气环境下直至放热顶点被探测到。													
	>400										>400	N/A	N/A	N/A

(Continued on next page)

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TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

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TABLE 1.
MATERIAL PROPERTIES
材料属性

CLIENT客户: Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司
PROJECT项目: Geocell Testing

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Material Description材料描述: Geocell

QC'd By质量担当: *Steve/姜心恩*
TRI Job No.工作编号: SCH25251
TRI Control No.受控编号: 13441

SPECIMENS样品

		1	2	3	4	5	6	7	8	9	10	Avg. 平均值	Std. Dev. 标准偏差	Min 最小值	Max 最大值
METHOD	DESCRIPTION														
ISO 527**	<u>Tensile Properties/拉伸性能:</u>														
		Before Weathering 耐候前													
	Tensile Strength at Yield 屈服拉伸强度 (kN/m)														
沿机方向	MD	18.9	18.7	19.1	19.5	18.9						19.0	0.3	18.7	19.5
	Tensile Strength at Break 断裂拉伸强度 (kN/m)														
沿机方向	MD	26.9	25.3	23.2	25.0	28.5						25.8	1.8	23.2	28.5
	Elongation at Yield 屈服延伸率 (百分比percent)														
沿机方向	MD	18	19	17	17	18						18	1	17	19
	Elongation at Break 断裂延伸率 (百分比percent)														
沿机方向	MD	391	366	341	377	389						373	18	341	391
ISO 527**	<u>Tensile Properties/拉伸性能:</u>														
		After Weathering 耐候后													
	Tensile Strength at Yield 屈服拉伸强度 (kN/m)														
沿机方向	MD	19.7	19.2	19.4	19.3	19.8						19.5	0.2	19.2	19.8
	Tensile Strength at Break 断裂拉伸强度 (kN/m)														
沿机方向	MD	28.1	27.2	26.5	28.4	27.6						27.6	0.7	26.5	28.4
	Elongation at Yield 屈服延伸率 (百分比percent)														
沿机方向	MD	18	19	20	20	18						19	1	18	20
	Elongation at Break 断裂延伸率 (百分比percent)														
沿机方向	MD	400	378	379	394	394						389	9	378	400

(Continued on next page)

(Sheet 2 of 6)

TABLE 表 1.
MATERIAL PROPERTIES
材料属性

CLIENT客户: Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司
PROJECT项目: Geocell Testing

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Date Reported报告日期: **2026.01.21**
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Material Description材料描述: **Geocell**

QC'd By质量担当: *Steve/姜心恩*
TRI Job No.工作编号: **SCH25251**
TRI Control No.受控编号: **13441**

SPECIMENS样品

	1	2	3	4	5	6	7	8	9	10	Avg. 平均值	Std. Dev. 标准偏差	Min 最小值	Max 最大值
METHOD	DESCRIPTION													
EN 12224**	Weathering Resistance (% Retained) via ISO 527 Tensile Property / 耐候老化后用ISO 527测抗拉强度 (残留率) <i>Tests were made as directed in EN12224. Total Exposure time: 430 hrs</i> <i>检测按照EN 12224 指导进行。总的曝露时间为430 小时</i>													
	Yield Strength 屈服强度 (% Retained残留率)													
沿机方向	MD	102									102	N/A	N/A	N/A
	Break Strength 断裂强度 (% Retained残留率)													
沿机方向	MD	107									107	N/A	N/A	N/A
	Yield Elongation 屈服延伸率 (% Retained残留率)													
沿机方向	MD	107									107	N/A	N/A	N/A
	Break Elongation 断裂伸长率 (% Retained残留率)													
沿机方向	MD	104									104	N/A	N/A	N/A

(Continued on next page)

(Sheet 3 of 6)



TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

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TABLE 1.
MATERIAL PROPERTIES

材料属性

CLIENT客户: Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司
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TRI Job No.工作编号: SCH25251
TRI Control No.受控编号: 13441

SPECIMENS样品

		1	2	3	4	5	6	7	8	9	10	Avg. 平均值	Std. Dev. 标准偏差	Min 最小值	Max 最大值
METHOD	DESCRIPTION														
ISO 527**	Tensile Properties/拉伸性能:														
		Before Oxidation 氧化前													
	Tensile Strength at Yield 屈服拉伸强度 (kN/m)														
沿机方向	MD	20.2	20.2	20.6	20.1	20.6						20.3	0.2	20.1	20.6
	Tensile Strength at Break 断裂拉伸强度 (kN/m)														
沿机方向	MD	28.2	26.1	24.3	26.3	25.1						26.0	1.3	24.3	28.2
	Elongation at Yield 屈服延伸率 (百分比percent)														
沿机方向	MD	18	18	17	18	18						18	0	17	18
	Elongation at Break 断裂延伸率 (百分比percent)														
沿机方向	MD	411	379	359	379	371						380	17	359	411
ISO 527**	Tensile Properties/拉伸性能:														
		After Oxidation 氧化后													
	Tensile Strength at Yield 屈服拉伸强度 (kN/m)														
沿机方向	MD	21.6	21.4	21.8	21.7	21.7						21.6	0.1	21.4	21.8
	Tensile Strength at Break 断裂拉伸强度 (kN/m)														
沿机方向	MD	28.7	25.6	25.3	28.3	30.3						27.6	1.9	25.3	30.3
	Elongation at Yield 屈服延伸率 (百分比percent)														
沿机方向	MD	16	16	16	15	16						16	0	15	16
	Elongation at Break 断裂延伸率 (百分比percent)														
沿机方向	MD	390	360	354	385	407						379	20	354	407

(Continued on next page)

(Sheet 4 of 6)

TABLE 1.
MATERIAL PROPERTIES

材料属性

CLIENT客户: Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司
PROJECT项目: Geocell Testing

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QC'd By质量担当: *Steve/姜心恩*
TRI Job No.工作编号: **SCH25251**
TRI Control No.受控编号: **13441**

SPECIMENS样品

	1	2	3	4	5	6	7	8	9	10	Avg. 平均值	Std. Dev. 标准偏差	Min 最小值	Max 最大值
METHOD	DESCRIPTION													
ISO 13438**	Oxidation Resistance (% Retained) via ISO 527 Tensile Property / 氧化后用ISO 527测抗拉强度 (残留率) <i>Tests were made as directed in ISO 13438 method A for 25 years service life.</i> 检测按照ISO 13438 方法A进行, 服务年限为25年。													
	Yield Strength 屈服强度 (% Retained残留率)													
沿机方向	MD	107									107	N/A	N/A	N/A
	Break Strength 断裂强度 (% Retained残留率)													
沿机方向	MD	106									106	N/A	N/A	N/A
	Yield Elongation 屈服延伸率 (% Retained残留率)													
沿机方向	MD	88									88	N/A	N/A	N/A
	Break Elongation 断裂伸长率 (% Retained残留率)													
沿机方向	MD	100									100	N/A	N/A	N/A

(Continued on next page)

(Sheet 5 of 6)



TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

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TABLE 1.
MATERIAL PROPERTIES

材料属性

CLIENT客户: Geoleed Engineering Materials Co., Ltd 泰安瑞丰工程材料有限公司
PROJECT项目: Geocell Testing

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QC'd By质量担当: *Steve/姜心恩*
TRI Job No.工作编号: **SCH25251**
TRI Control No.受控编号: **13441**

SPECIMENS样品

	1	2	3	4	5	6	7	8	9	10	Avg. 平均值	Std. Dev. 标准偏差	Min 最小值	Max 最大值
METHOD	DESCRIPTION													
ASTM D751	Seam Shear Strength 焊缝剪切强度 Modified for whole height Shear Strength 剪切强度 (N/100mm)													
	2201	2217	2177	2175	2159						2186	23	2159	2217
	Break on the Geocell Sheet: 断裂点位于格室母材上。													
ASTM D751**	Dead Load Seam Strength 160lbs for 7 days, temperature change on a 1 hour cycle from ambient room temp to 54°C 负载160 磅持续 7 天, 温度每小时循环变化一次, 从室温变化至 54°C													
	Pass										Pass	N/A	N/A	N/A
ISO 13426 Method B	Strength of Internal Structural Junctions 内部结构强度 Test was performed as directed in ISO 13426-1. CRE Type Tensile Testing Machine (TH8100S) equipped with 2" x 8" (50mmX 200mm) Grips 测试根据ISO 13426 的规定进行。很顶拉伸速率拉伸仪(TH8100S), 夹具尺寸: 50*200mm。拉伸速率20mm/min, 夹间距100mm。 was used. set for 0.8" (20 mm/min) constant rate of extension, with initial gauge length (distance between grips) of 4"(100mm) Full scale force range used for testing 量程: 50000N Peeling Strength 剥离强度 (kN)													
	1.801	1.804	1.816	1.649	1.747						1.763	0.069	1.649	1.816
ASTM D1693**	Environmental Stress-Cracking Resistance 耐环境应力开裂 (hours) (In Progress 测试中)													

** - Tested in TRI Texas
End of Table 1

(Sheet 6 of 6)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI SUZHOU from Client and all other related parties for any claims on issues, due to the use of this data, to the cost respective of the tests presented in this report; and the Client agrees to indemnify and hold harmless TRI SUZHOU from and against all liabilities in excess of the aforementioned limits.
通过接受了这篇报告中数据和结果,客户同意限定TRI苏州来自客户和所有其他相关方的责任。所有其因使用这些数据索赔问题,报告中提出的各项检测的成本;客户同意赔偿并承担后果,TRI苏州不承担超过上述限额的所有责任。