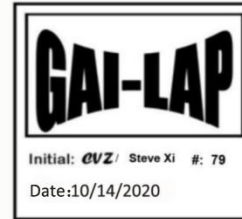


Oct 14th 2020

Shandong Innovative Material Technology Co.,Ltd
No.6399 East Tianqu Road Dezhou Shandong Province



Re: FINAL LABORATORY TEST REPORT 最终实验室检测报告

Dear Ms Hou:

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 **final** laboratory report for the **Conformance** testing of **one (1) 1.5mm smooth Geomembrane sample**.

附上一份 一个光面土工膜样品的最终符合性实验室检测报告

PROJECT NAME 项目名称: Geomembrane Testing

DATE REPORTED 报告日期: Oct 14th 2020

REFERENCE TRI JOB NO. 涉及工作编号: SCH201154

DATE RECEIVED 接收日期: Sep 27th, 2020

SAMPLE(S) SENT BY 送样人: Shandong Innovative

SAMPLE IDENTIFICATIONS 样品信息:

SAMPLE ID 样品 ID

1.5mm smooth Geomembrane

TRI CONTROL NUMBER 受控编号

86830

TESTS REQUIRED / PERFORMED 检测需求/检毕:

TEST METHOD 检测方法

1. ASTM D5199
2. ASTM D6693
3. ASTM D1603
4. ASTM D5596
5. ASTM D1004
6. ASTM D4833

DESCRIPTION 描述

Thickness
Tensile Strength
Carbon Black Content
Carbon Black Dispersion
Tear Resistance
Puncture Resistance

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。

Respectfully, 此致

TRI Geosynthetic Testing and Services (Suzhou) Co., Ltd.



Steve Xi
Quality Assurance



Cora Queja
General Manager

Signatures are on file

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 个月后备弃。如需保存更长时间, 请以书面方式提前通知

4 Pages Total (including this sheet)

TABLE 1.
MATERIAL PROPERTIES
 材料属性

CLIENT客户: **Shandong Innovative**
 PROJECT项目: **Geomembrane Testing**

Date Received接收日期: **2020.09.27**
 Date Reported报告日期: **2020.10.14**
 Client Sample ID样品编号: **1.5mm Smooth Geomembrane**
 Material Description材料描述: **1.5mm Smooth Geomembrane**

QC'd By质量担当: Steve/袁... 袁
 TRI Job No.工作编号: **SCH201154**
 TRI Control No.受控编号: **86830**

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	Proj. Specs. 项目指标 (See Note1)	
METHOD	DESCRIPTION																
ASTM D5199	Thickness 厚度 (mm) <i>Apparatus: Dead weight dial micrometer with 6.35mm (0.250in) dia presser foot and a pressure of 43.10 kPa (6.25psi) 仪器: 测微计带6.35mm 直径的压脚, 并由65.8g-509g 重的压脚提供43.10kPa 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</i>																
		1.62	1.58	1.56	1.62	1.63	1.63	1.52	1.54	1.50	1.53	1.57	0.05	1.50	1.63	≥1.5	
ASTM D6693 Type IV IV型 也可是 D638	Tensile Properties拉伸性能: <i>Test Specimens: Type IV, Width of narrow section: 0.25"(6.4mm) Length of narrow section: 1.3"(33 mm), Width Overall: 0.75"(19.1 mm), 检测样品: IV 型, 狭长部分宽度: 0.25"(6.4mm), 狭长部分长度: 1.3"(33mm), 总体宽度: 0.75" (19.1mm) Length Overall: 4.5"(114mm) Conditioning: Conducted test in standard laboratory atmosphere of 21 +/-2°C (70 +/-3.6°F), and 总体长度: 4.5" (114mm) 条件: 测试条件在标准实验室大气环境温度 21 ± 2 °C 相对湿度: 60+/-10% 下进行. 60+/-10% relative humidity. CRE Type Tensile Testing Machine (YT010P) is set for rate of Separation: 20"/min (VLDPE/LLDPE) 设定 CRE 拉伸仪 (YT010P) 分离速率: 20"/min (VLDPE/LLDPE) 夹具初始距离: 2.5"(63 mm); 传感器量程: 100lbs(500 N) Initial gauge length: 2.5" (63mm) Load full scal: 100lbs(500 N)</i>																
	Tensile Strength at Break 断裂强度 (kN/m)																
沿机方向	MD	55	49	46	45	47						48	4	45	55	≥40	
非沿机方向	TD	47	47	47	53	50						49	3	47	53		
	Elongation at Break 断裂延伸率 (百分比percent)																
沿机方向	MD	860	858	832	866	822						847	19	822	866	≥800	
非沿机方向	TD	909	885	880	949	928						910	29	880	949		

(Continued on next page)

(Sheet 1 of 3)



TABLE 1.
MATERIAL PROPERTIES

材料属性
 CLIENT客户: **Shandong Innovative**
 PROJECT项目: **Geomembrane Testing**

Date Received接收日期: **2020.09.27**
 Date Reported报告日期: **2020.10.14**
 Client Sample ID样品编号: **1.5mm Smooth Geomembrane**
 Material Description材料描述: **1.5mm Smooth Geomembrane**

QC'd By质量担当: *Steve*
 TRI Job No.工作编号: **SCH201154**
 TRI Control No.受控编号: **86830**

		SPECIMENS样品														Proj. Specs. 项目指标 (See Note1)			
		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 D1004	Tear Resistance 撕裂强度 (N)																		
Die C	Set CRE Type tensile testing machine(YT010 P) constant rate of separation 2" (50mm)/min, initial gauge length: 1" (25.4mm).																		
模具C	设定拉伸仪 (YT010 P) 速率为 2" (50mm)/min, 夹具初始距离: 1"(25.4mm), 传感器为 100lbs(500 N), 样本由蝶形模具截取.																		
	Load full scale: 100lbs(500 N). Specimen was cut by butterfly die.																		
沿机方向	MD	228	226	235	224	253	240	251	244	239	240	238	10	224	253	≥150			
非沿机方向	TD	229	224	245	231	237	228	232	226	241	239	233	7	224	245				
ASTM D4833	Puncture Resistance 穿刺强度 (N)																		
	Specimens were treated as directed in Test Method D4833. They were clamped without tension between circular plates of																		
	样品按检测方法D4833的指导进行检测。在圆形环状夹具夹住样品时不要有任何的张力。																		
	a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the																		
	夹具牢固的固定在拉伸仪上, 待检样品需超过或漏出圆环夹具的边缘。																		
	clamping plates.																		
	606	580	573	580	608	607	572	584	572	589	591	18	564	618	≥370				
	604	564	618	591	615														
ASTM D1603	Carbon Black Content/炭黑含量 (百分率percent)																		
	2.44	2.47											2.46	0.02	2.44	2.47	2-3		
ASTM D5596	Carbon Black Dispersion 炭黑分散度 (category rating per reference chart PCN: 12-455960-38等级范围参照图PCN)																		
	1	1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	A-1			

(Continued on next page)

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TABLE 表 1.
MATERIAL PROPERTIES
材料属性

CLIENT客户: Shandong Innovative
 PROJECT项目: Geomembrane Testing

Date Received接收日期: **2020.09.27**
 Date Reported报告日期: **2020.10.14**
 Client Sample ID样品编号: **1.5mm Smooth Geomembrane**
 Material Description材料描述: **1.5mm Smooth Geomembrane**

QC'd By质量担当: *Seac/袁心强*
 TRI Job No.工作编号: **SCH201154**
 TRI Control No.受控编号: **86830**

SPECIMENS样品										Avg. 平均值	Std. Dev. 标准偏差	Min 最小值	Max 最大值	Proj. Specs. 项目指标 (See Note1)	
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D3895*	Oxidative Induction Time 氧化诱导时间(min) Before Exposure 曝露前														
	<i>Two (2) identical specimens were prepare in accordance with this standard. The specimens were obtained in the middle section of the sample, weighed and placed in a Tzero aluminum pan then heated from 35°C to 200°C with a heat rate of 20°C/min in flowing nitrogen</i> 按照标准取两个相同样品, 样品从中间部分取得, 并称重放置在铝皿中加热从35度到200度速率为每分钟20度。在流动氮气中 <i>Atmosphere was switched to oxygen while holding isothermal temperature of 200 °C until exothermic peak is detected.</i> 进行并保持5分钟。当保持在200度等温时切换到氧气环境下直至放热顶点被探测到。														
	139	138									139	1	138	139	≥100

*-Tested at TRI CA
 End of Table 1

(Sheet 3 of 3)

Note 1 : The Project Specification values reflected herein were provided by the Client. 项目指标由客户提供

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.
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