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DATE: March 26, 2009

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Investigative Chemistry	●	Geotechnical	●	Construction Materials
Non Destructive Testing	●	Failure Analysis	●	Product Evaluation
Metallurgical Analysis	●	Materials Testing	●	Welder Qualification

Evaluation Report for the SpecChem LLC
Spec Hard Concrete Sealer & Hardener

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I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Engineer under the laws of the State of Minnesota.



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INTRODUCTION**介绍**

Client:	SpecChem LLC				
Project:	Information of Client				
Subject:	Laboratory Testing of SpecHard Concrete Sealer and Hardener				
Job No.:	02-209	Report No.:	3274354.1R3.ITEA	Date:	26/3/2009

We present herewith laboratory test results of the SpecChem LLC Spec Hard material received from the client. The sample was received in a sealed 5 gallon container.

我们在此提供由委托人提供的施贝公司施贝混凝土密封固化剂材料的实验室测试报告。收到的样品采用5加仑的密封包装。

At the client's request, the sample was tested for a series of properties as per the applicable ASTM procedures. Both the test results and the test methods are presented herein.

按照委托人的要求，样品按照 ASTM 标准进行一系列产品性能测试。测试结果和方法都在此呈现。

The amount of SpecChem LLC Spec Hard used was the recommended rate (300 sq. ft. per gallon) of the client.

按照委托人的推荐施贝混凝土密封固化剂的测试使用量是每加仑 300 平方英尺。

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TEST RESULTS**测试结果**

Properties(*)	Test Method	Results
Moisture Loss, grams:水分损失: (initial 24 hr. period) (初始 24 小时) -Treated Sample 处理后样本 -Untreated Samples (control)未处理样本	ASTM C-156	22.6 grams 59.7 grams
Compressive Strength, psi:抗压强度, psi: -Treated Sample 处理后样本 7 days of age 7 天龄期 28 days of age 28 天龄期 -Untreated Samples (control) 未处理样本 7 days of age 7 天龄期 28 days of age 28 天龄期	ASTM C-39	3674 4400 2720 4027
Compressive Strength, psi:抗压强度, psi: (28 days) (28 天) -treated 处理后样本 -untreated 未处理样本	ASTM C-805	3975 3348
Bonding Strength, psi: 粘结强度: (28 days) (28 天) -treated 处理后样本 Epoxy 环氧树脂 Urethane 聚氨酯 -untreated 未处理样本 Epoxy 环氧树脂 Urethane 聚氨酯	ASTM 3359	2% peeling 起皮(passes) (通过) 4% peeling 起皮(passes)(通过) 5% peeling 起皮(passes)(通过) 8% peeling 起皮(passes)(通过)
Water Permeability:渗透性: cm/sec. cm/秒 (100 psi head pressure) (100 psi 水头) -Treated 处理后样本 -Untreated (control) 未处理样本	ASTM D-5084	2.3X10 ⁻¹¹ cm/sec. 1.5x10 ⁻⁹ cm/sec.
Abrasion Resistance:抗磨损性: wt. Loss:重量损失: -Treated 处理后样本 -Untreated (control) 未处理样本	ASTM C-779	12.3 grams 克(depth of wear:磨损深度: 0.3mm) 66.0 grams 克(depth of wear:磨损深度: 1.6mm)

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TEST RESULTS

测试结果

<p>Coefficient of Friction: 摩擦系数: (Smooth Trowel Concrete) (抹平平滑混凝土面) -Treated(wet surface)处理后样本(湿表面) Treated (dry surface)处理后样本(干表面) -Untreated(wet surface)未处理后样本(湿表面) Untreated (dry surface)未处理样本(干表面)</p>	<p>ASTM C-1028</p>	<p>0.84 passes 0.82 passes 0.66 passes 0.70 passes</p>
<p>Weathering: 耐候性: (UV light and water exposure)(紫外线和水暴露) -Treated 处理后样本 -Untreated (control) 未处理样本</p>	<p>ASTM G-23</p>	<p>No adverse effects 未见负面影响 No adverse effects 未见负面影响</p>

(*) - The concrete used in these studies had a design strength f_c' of 3500 psi.

本次实验研究中所采用混凝土等级 f_c' 是 3500 psi.

- The test results are the average of at least three specimens.

实验结果数据是至少三块样本的平均值。

- Depth of penetration of SpecChem Spec Hard was 5 to 6 mm into concrete. Symons

施贝密封固化剂混凝土渗透值是 5 到 6 毫米。

- Coefficient friction: 0.60 is generally considered minimum acceptable.

摩擦系数: 0.60 一般是被认为可以接收的最低值。

CONCLUSIONS**结论**

Some of the concrete properties which are improved by coating the concrete surface with SpecChem Spec hard are as follows:

在涂抹施贝混凝土密封固化剂以后，如下一些混凝土特性得到了提高：

- Compressive strength 抗压强度
- Hardening of surface 表面硬度
- Abrasion resistance 抗磨损性
- Coefficient of friction 摩擦系数
- Water permeability 抗水渗透性
- Durability and weather resistance 耐久性和耐候性
- Controls the moisture loss 控制水份损失
- Seals the surface microcracks 密封以及表面微裂缝
- Dust proofs the surface 表面抗尘
- Improves the surface appearance. 外观质量提高