佳宏新材
JIAHONG XINCAI



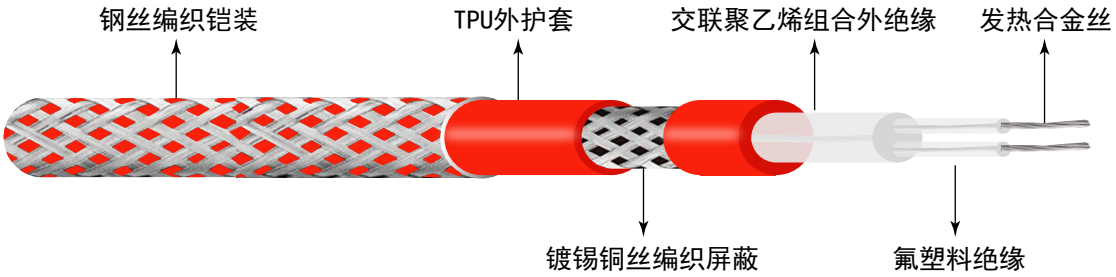
技术手册

CONNECT AND PROTECT

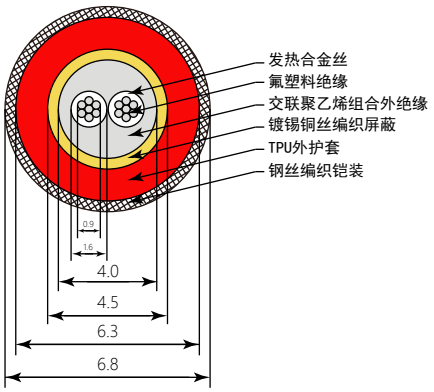
车辆及人行通道
路面坡道融雪系统

400-0007-922 www.jh-trace.com jh-trace@ahjiahong.com

SX产品技术说明



产品结构参数				
工序	项目	单位	产品结构参数	结构示意图
电气参数	发热方式		双导双发热	
	产品米功率	W/米	50	
	产品电压	V	220	
导 体	导体材料		镀锡铜丝/合金丝	
	结构（根数/直径）	n/mm	7/0.3	
	导体后外径	mm	0.9±0.05	
绝 缘	绝缘材料		氟塑料	
	绝缘厚度	mm	0.35±0.05	
	绝缘后外径	mm	1.6±0.1	
组合外绝缘	组合材料		XLPE(交联聚乙烯)	
	组合最小厚度	mm	0.2	
	组合后外径	mm	4.0±0.1	
屏 蔽	屏蔽材料		镀锡铜丝材质	
	屏蔽方式		编织屏蔽	
	钢丝结构(根数/直径)	n/mm	0.12	
	编织密度	%	≥70	
	编织后产品外径	mm	4.5±0.1	
护 套	护套材质		TPU(聚氨酯弹性体)	
	护套厚度	mm	0.9±0.05	
	护套后外径	mm	6.3±0.1	
铠 装	铠装材料		钢丝材质	
	铠装方式		编织铠装	
	钢丝直径	mm	0.15	
	编织密度	%	≥70	
	铠装后产品外径	mm	6.8±0.1	



一、双导双发热特点

施工方便-单导电缆的两端都需要连接供电电源，所以在铺设时要考虑将电缆尾部拉回接线处，这种要求在很多情况在会很难从操作。双导电缆则不需要考虑这个问题，由于电缆本身自成回路，所有的接线全在同一端，在施工中，只要接线端连接供电电源，不需要接线的尾端，可根据具体情况任意放置，降低了电缆施工的难度。

抗拉强度高-双导电缆由两根线芯组成，电缆在受拉受力时，相比单导电缆单根线芯具备更大的抗拉强度；双导电缆外径比单导电缆大，用料更多，相应抗压抗拉强度越高。

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二、米功率

米功率50W/米-双导米功率50W/米（等同单导25W/米），同比单导结构，发热受电更安全。

发热线缆米数更少-采用双导50W/米的产品结构（即每米具备50W的功率），高的米功率铺设时减少线缆的使用米数，降低采购成本。

三、产品冷热连接技术

对于发热电缆的尾端和中间接线处，采用特制双层厚壁热塑套管，该套管已获得UL认证。并参照UL486D对该系列套管进行了老化性能、应力腐蚀酸碱性、浸水密封、低温埋地安装等试验，套管可长期耐受温度-55℃-120℃，收缩后厚度2.0mm，在沥青、埋地、空气敷设环境中可长期使用。具备优良的电气、机械可靠性，提高发热线缆中间连接及尾端接线的使用寿命。

四、发热丝

发热丝材质-根据不同的功率，选用铜镍合金丝、铬镍合金丝和镀锡铜丝作为发热丝。

发热丝柔软易弯曲-发热丝直径0.28-0.32mm，采用7股绞合结构，线缆在施工和沉降弯曲的过程中，7根丝可以均匀分布受拉受压力，结构更加柔软，更易弯曲。同比单股发热线芯容易折断，不易弯曲。

发热均匀可靠-两根发热丝绞合外径0.9mm，发热丝直径大，越容易克服高温下的变形问题，延长自身的使用寿命，且发热更均匀。

五、绝缘氟塑料

耐高低温能力广-长期耐高温、低温的工作温度可达-60℃～200℃，具备优良的热稳定性。

电气性能强-氟塑料的介电常数低、体积电阻率高，同等塑料中，电气绝缘性能最优。

机械性能强-氟塑料抗拉强度和断裂伸长率高于PVC、XLPE等常规线缆塑料。有着优良的耐气候老化性能和机械强度；而且不受各种酸、碱和有机溶剂影响。

六、组合外绝缘

耐热能力优良-网状立体结构的XLPE具有优异的耐热性能，在300℃以下不会分解及碳化，长期工作温度可达90℃，热寿命可达40年。

绝缘性能优良-XLPE保持了PE原有的良好绝缘特性，且绝缘电阻进一步增大。其介质损耗角正切值很小，且受温度影响不大。

机械特性优良-在大分子间建立了新的化学键，XLPE的硬度、刚度、耐磨性和抗冲击性均有提高，不会易受环境应力而龟裂。

七、铜丝编织屏蔽

柔软伸缩性强，具备各种受力不破坏能力-镀锡铜丝编织即具柔软伸缩性；其抗弯曲变形能力，在拉力和压力的环境下，不会存在断丝破坏，保证功能完整；

具备地线功能-屏蔽层由铜组成，具备低的电阻率，且截面积超过0.5mm^2，可作为地线使用。

具备屏蔽功能-编织屏蔽，可以减消地面、地上的磁场干扰，保证发热体正常发热。

八、TPU外护套

减震能力强-TPU（聚氨酯弹性体）护套承载能力、减震性以及抗冲击性等性能突出。线缆在沉降等受压环境时，TPU护套具备弹性减消压力，保护缆芯内部，防止发热线芯受压破坏。

耐高低温能力广-长期耐高温、低温的工作温度可达-40℃～120℃，同比PVC最高长期最高耐温90℃。具备优良的热稳定性，常用的沥青铺设温度在100-140℃，该温度铺设时间1-3小时，TPU护套短期在该温度和时间，不会有性能破坏。

具备耐撕裂、耐磨与弯曲特性。

具备卓越的高张力、高拉力、强韧和耐老化特性。常用于室外停车场的充电桩电缆护套材质，具备高的使用寿命。

九、不锈钢丝编织铠装

机械保护-钢丝铠装可承受纵向拉断力，机械保护整根缆芯，防止路面沉降造成的压力和拉力对线缆进行破坏，使发热线缆正常运行。

抗老化能力-不锈钢丝具有较长的使用寿命，耐腐蚀性能强，适用于地面多数环境，正常使用不锈钢丝的使用寿命70-100年。

十、控制系统介绍

温度和湿度是冰雪形成的主要气候条件，将冰雪探测器固定在地面预先设置的地面沟槽中，并且用金属支架进行固定；冰雪探测器的探头（ETOG-55）可以同时探测温度和湿度的数据，然后将相关数据传送到探测器的控制模块（ETO-2）进行分析处理。当地面的温度和空气湿度达到或超过预先设定的值时，控制器中的继电器触点闭合，输出信号接通电源开始融雪融冰；当该过程基本完成后，温度或湿度偏离设定值，控制器中的继电器触点断开，从而断开电源，达到融雪的自动控制。

整体系统的电源采用220V, 50Hz的交流电源作为供电输入，给整个电伴热系统供电，按照预设定的控制参数进行运行，确保除冰融雪的效果。

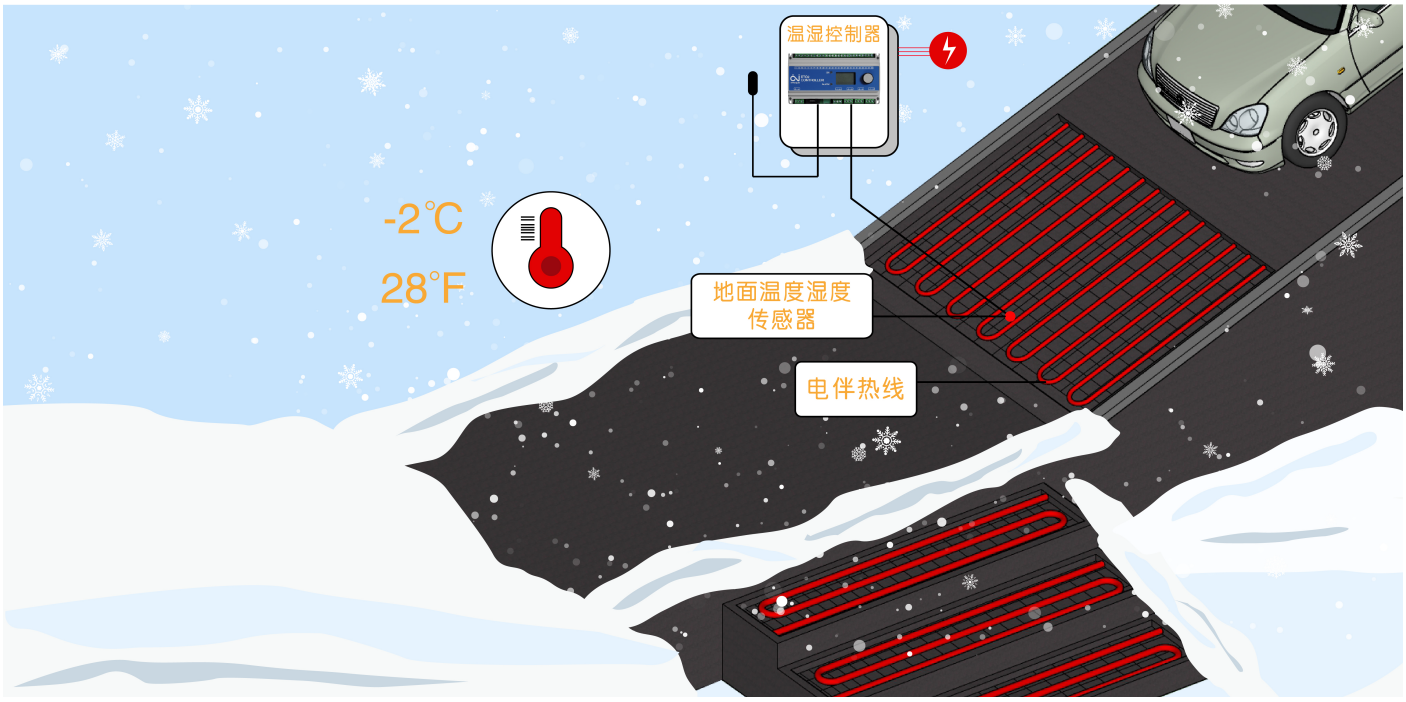
ETO2
温湿
度控
制器



ETOG-55
温湿度传感器

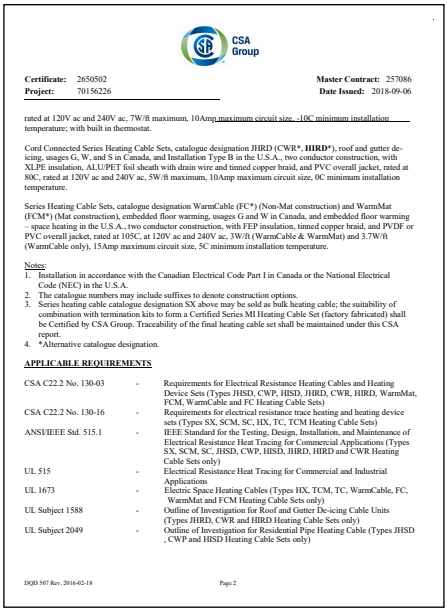


控制系统示例图



十一、应用认证

SX产品已获得CE，CSA以及ETL认证-参照CSA C22.2 NO.130,UL515，IEEE Std515，UL1673等国际标准的要求，进行了严格的实验检测。检测并通过实验项目包括：介电强度耐压测试、绝缘电阻测试、阻水测试、过载测试、耐剪切测试、冷态弯曲测试、最高暴露温度测试等，充分证明了产品的功能性、安全性与质量稳定性。产品在北美市场长期应用，收到良好的市场反馈。



CSA Group

Certificate: 2650502 **Master Contract:** 257086
Project: 70156226 **Date Issued:** 2018-09-06

rated at 120V ac and 240V ac, 7W/ft maximum, 10Amp maximum circuit size, -10C minimum installation temperature; with built in thermostat.

Cord Connected Series Heating Cable Sets, catalogue designation JHRD (CWR*, **HIRD***), roof and gutter de-icing, usages G, W, and S in Canada, and Installation Type B in the U.S.A., two conductor construction, with XLPE insulation, ALU/PET foil sheath with drain wire and tinned copper braid, and PVC overall jacket, rated at 80C, rated at 120V ac and 240V ac, 5W/ft maximum, 10Amp maximum circuit size, 0C minimum installation temperature.

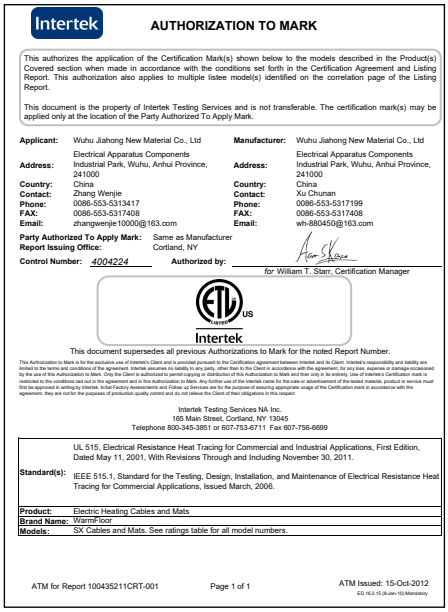
Series Heating Cable Sets, catalogue designation WarmCable (FC*) (Non-Mat construction) and WarmMat (FCM*) (Mat construction), embedded floor warming, usages G and W in Canada, and embedded floor warming – space heating in the U.S.A., two conductor construction, with FEP insulation, tinned copper braid, and PVDF or PVC overall jacket, rated at 105C, at 120V ac and 240V ac, 3W/ft (WarmCable & WarmMat) and 3.7W/ft (WarmCable only), 15Amp maximum circuit size, 5C minimum installation temperature.

Notes:
1. Installation in accordance with the Canadian Electrical Code Part I in Canada or the National Electrical Code (NEC) in the U.S.A.
2. The catalogue numbers may include suffixes to denote construction options.
3. Series heating cable catalogue designation SX above may be sold as bulk heating cable; the suitability of combination with termination kits to form a Certified Series MI Heating Cable Set (factory fabricated) shall be Certified by CSA Group. Traceability of the final heating cable set shall be maintained under this CSA report.
4. *Alternative catalogue designation.

APPLICABLE REQUIREMENTS

CSA C22.2 No. 130-03	-	Requirements for Electrical Resistance Heating Cables and Heating Device Sets (Types JHSD, CWP, HISD, JHRD, CWR, HIRD, WarmMat, FCM, WarmCable and FC Heating Cable Sets)
CSA C22.2 No. 130-16	-	Requirements for electrical resistance trace heating and heating device sets (Types SX, SCM, SC, HX, TC, TCM Heating Cable Sets)
ANSI/IEEE Std. 515.1	-	IEEE Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications (Types SX, SCM, SC, JHSD, CWP, HISD, JHRD, HIRD and CWR Heating Cable Sets only)
UL 515	-	Electrical Resistance Heat Tracing for Commercial and Industrial Applications
UL 1673	-	Electric Space Heating Cables (Types HX, TCM, TC, WarmCable, FC, WarmMat and FCM Heating Cable Sets only)
UL Subject 1588	-	Outline of Investigation for Roof and Gutter De-icing Cable Units (Types JHRD, CWR and HIRD Heating Cable Sets only)
UL Subject 2049	-	Outline of Investigation for Residential Pipe Heating Cable (Types JHSD , CWP and HISD Heating Cable Sets only)

DQD 507 Rev. 2016-02-18 Page 2



Intertek

AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	Wuhu Jiahong New Material Co., Ltd	**Manufacturer:**	Wuhu Jiahong New Material Co., Ltd
Address:	Electrical Apparatus Components Industrial Park, Wuhu, Anhui Province, 241000	**Address:**	Electrical Apparatus Components Industrial Park, Wuhu, Anhui Province, 241000
Country:	China	**Country:**	China
Contact:	Zhang Wenjie	**Contact:**	Xu Chunan
Phone:	0086-553-5313417	**Phone:**	0086-553-5317199
FAX:	0086-553-5317408	**FAX:**	0086-553-5317408
Email:	zhangwenjie10000@163.com	**Email:**	wh-880450@163.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Cortland, NY
Control Number: 4004224 **Authorized by:** for William T. Starr, Certification Manager

ETL Listed US
Intertek

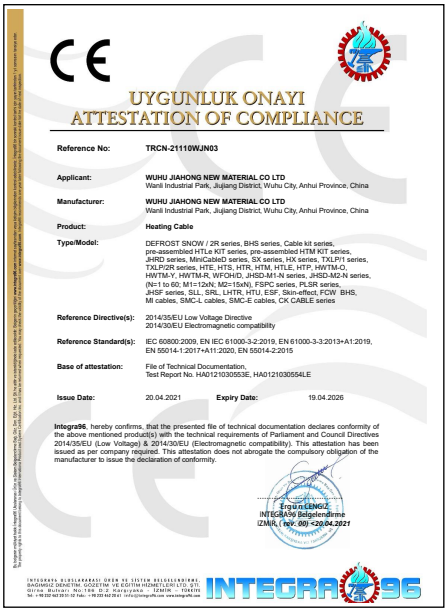
This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
165 Main Street, Cortland, NY 13045
Telephone 800-345-3851 or 607-753-6711 Fax 607-756-6699

Standard(s):	UL 515, Electrical Resistance Heat Tracing for Commercial and Industrial Applications, First Edition, Dated May 11, 2001, With Revisions Through and Including November 30, 2011. IEEE 515.1, Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications, Issued March, 2006.
Product:	Electric Heating Cables and Mats
Brand Name:	WarmFloor
Models:	SX Cables and Mats. See ratings table for all model numbers.

ATM for Report 100435211CRT-001 Page 1 of 1 ATM Issued: 15-Oct-2012
ED 16.3.15 (8-Jan-15) Mandatory



CE

UYGUNLUK ONAYI
ATTESTATION OF COMPLIANCE

Reference No: TRCN-21110WJN03

Applicant: WUHU JIAHONG NEW MATERIAL CO LTD
Wanli Industrial Park, Jiujiang District, Wuhu City, Anhui Province, China

Manufacturer: WUHU JIAHONG NEW MATERIAL CO LTD
Wanli Industrial Park, Jiujiang District, Wuhu City, Anhui Province, China

Product: Heating Cable

Type/Model: DEFROST SNOW / 2R series, BHS series, Cable kit series, pre-assembled HTL+ KIT series, pre-assembled HTM KIT series, JHRD series, MiniCableD series, SX series, HX series, TXLP/1 series, TXLP/2R series, HTE, HTS, HTR, HTM, HTLE, HTP, HWTM-O, HWTM-Y, HWTM-R, WFCHID, JHSD-M1-N series, JHSD-M2-N series, (N=1 to 60; M1=12kN; M2=15kN), FSPC series, PLSR series, JHSF series, SLL, SRL, LHTR, HTU, ESF, Skin-effect, FCW BHS, MI cables, SMC-L cables, SMC-E cables, CK CABLE series

Reference Directive(s): 2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic compatibility

Reference Standard(s): IEC 60800:2009, EN IEC 61000-3-2:2019, EN 61000-3-3:2013+A1:2019, EN 55014-1:2017+A11:2020, EN 55014-2:2015

Base of attestation: File of Technical Documentation,
Test Report No. HA012103055JE; HA012103055ALE

Issue Date: 20.04.2021 **Expiry Date:** 19.04.2026

Integra96, hereby confirms, that the presented file of technical documentation declares conformity of the above mentioned product(s) with the technical requirements of Parliament and Council Directives 2014/35/EU (Low Voltage) & 2014/30/EU (Electromagnetic compatibility). This attestation has been issued as per company required. This attestation does not abrogate the compulsory obligation of the manufacturer to issue the declaration of conformity.

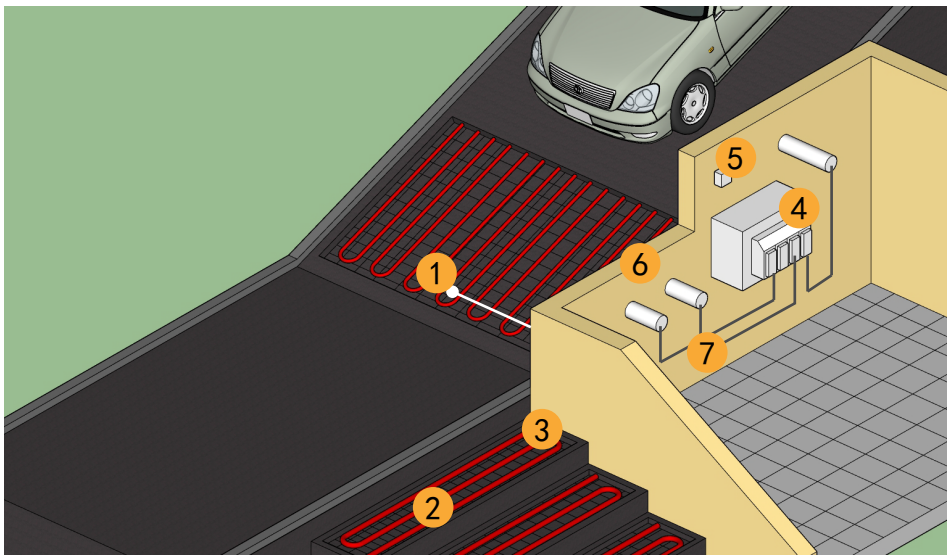
Ergun CENGIZ
INTEGRA96 Belgelendirme
IZMIR, (rev. 00) <20.04.2021

INTEGRA96

SX结构适用于地面埋设，沥青铺设，高速公路融雪等环境-其耐高低温、线缆机械能力已经经过市场的验证等等。在国内首家取得北美ETL认证，在国内为第一家合法的将道路融雪电缆产品出口到北美市场。

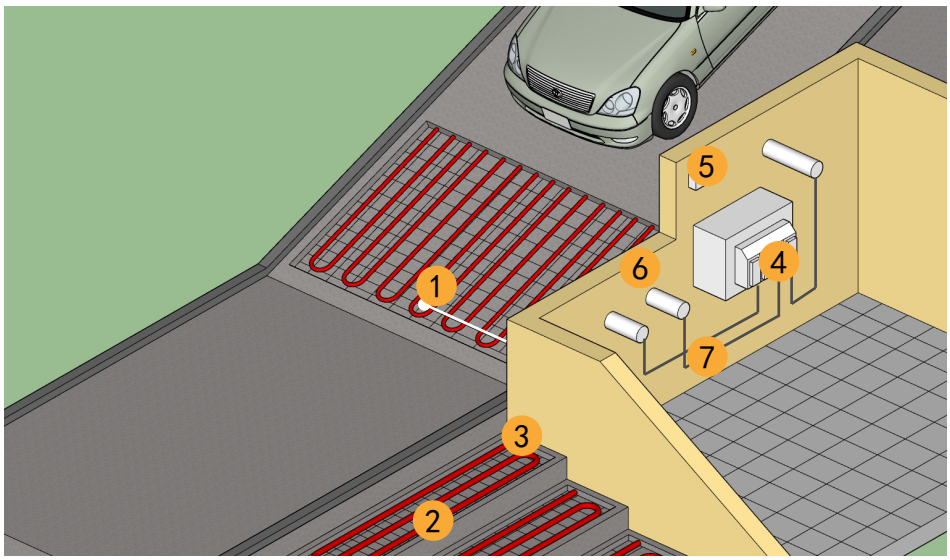


混凝土应用



1. 温度传感器
2. SX伴热线
3. 连接和尾端套件
4. 控制单元
5. 环境温度传感器
6. 连接和尾端套件
7. 连接电缆

沥青应用



1. 温度传感器
2. SX伴热线
3. 连接和尾端套件
4. 控制单元
5. 环境温度传感器
6. 连接和尾端套件
7. 连接电缆

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