SPECIFICATION FOR APPROVAL

CUSTOMER:

CUSTOMER PART NO:

PART NO: **210-10196** REVISION: **PSA**

DESCRIPTION: WATERPROOF USB 3.1 TYPE C FEMALE CL1.00mm HYBRID TYPE

	MANUFACTURE SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY:		
DATE:		

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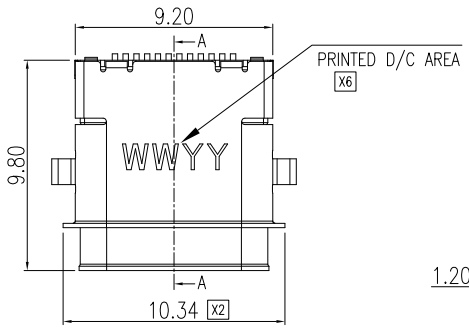
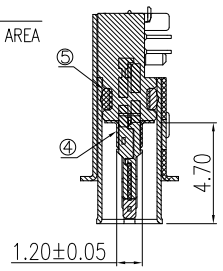
Tu-Cheng City, Taipei Hsien, Taiwan
TEL: +886-2-2262-0027
FAX: +886-2-2274-7954

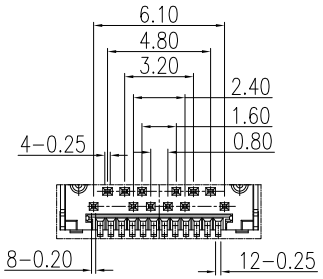
PROPRIETARY INFORMATION
COMPANY CONFIDENTIAL

REV.	ECN. NO.	DESCRIPTION	ENG	DATE
X1		INITIAL	Keen	03/26/2021
X2		OUT SHELL FLANGING CHANGED	Keen	09/16/2021
X3		OUT SHELL FOOT POSITION CHANGED	Keen	09/18/2021
X4		UPDATE THE DRAWING	Keen	10/21/2021
X5		REMOVE THE OUTER WATERPROOF RING	Joy	11/08/2021
X6		UPDATE THE DRAWING	Joy	12/10/2021

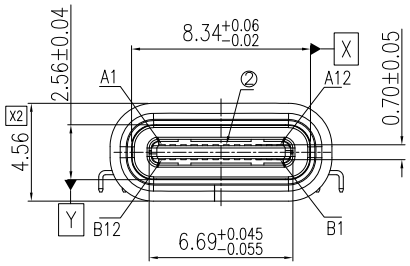


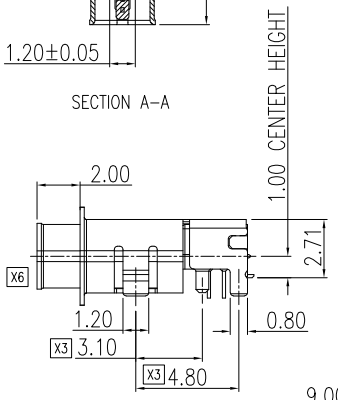


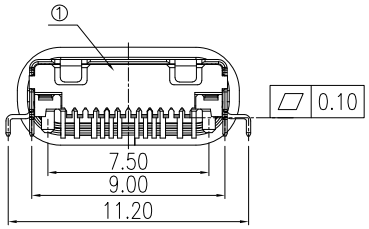
SECTION A-A

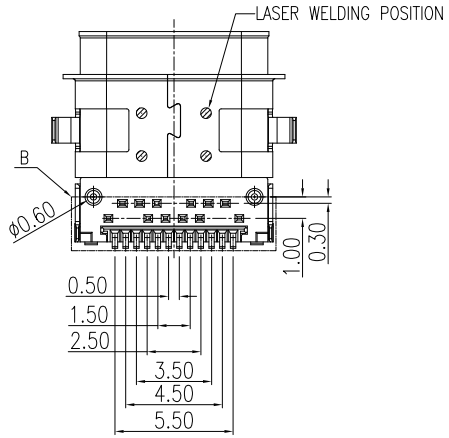


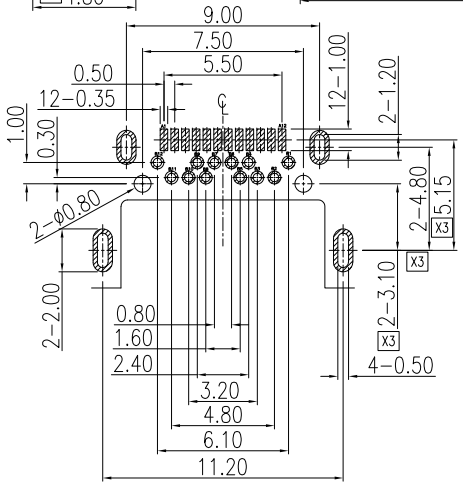
DETAIL B





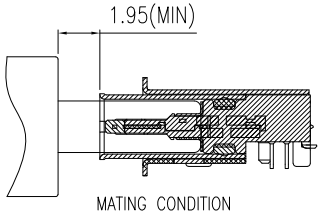




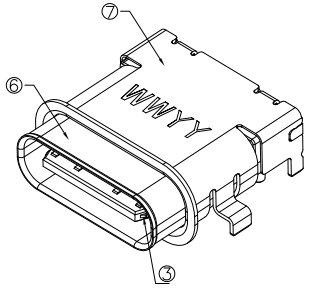


RECOMMENDED PCB LAYOUT
TOLERANCE:±0.05mm

NOTES :
1.ELECTRICAL CHARACTERISTICS;
 1-1. CONTACT RESISTANCE: 40mΩ Max FOR INITIAL.
  10mΩ CHANGE AFTER TEST. MEASURE AT 20mV, 100mA.
 1-2.CONTACT CURRENT RATING: 5A FOR VBUS PIN;
  1.25A FOR VCONN PIN.
 1-3.DIELECTRIC WITHSTANDING VOLTAGE: 100V AC R.M.S.
 1-4.INSULATION RESISTANCE 100MΩ Min.
 1-5.OPERATING TEMPERATURE: -40°C~85°C
2.MECHANICAL CHARACTERISTICS:
 2-1.MATING FORCE: 5~20 N.
 2-2.UNMATED FORCE: 8~20N AFTER TEST.
 2-3.DURABILITY: 10,000 CYCLES
3.PACKAGE: REEL



MATING CONDITION



USB TYPE-C PIN ASSIGNMENTS

Pin	Signal Name	Mating Sequence	Pin	Signal Name	Mating Sequence
A1	GND	First	B12	GND	First
A2	SSTXp1	Second	B11	SSRXp1	Second
A3	SSTXn1	Second	B10	SSRXn1	Second
A4	V_{BUS}	First	B9	V_{BUS}	First
A5	CC1	Second	B8	SBU2	Second
A6	Dp1	Second	B7	Dn2	Second
A7	Dn1	Second	B6	Dp2	Second
A8	SBU1	Second	B5	CC2	Second
A9	V_{BUS}	First	B4	V_{BUS}	First
A10	SSRXn2	Second	B3	SSTXn2	Second
A11	SSRXp2	Second	B2	SSTXp2	Second
A12	GND	First	B1	GND	First

IP-53

ITEM	NAME	Q'TY	DESCRIPTION	NOTE
7	OUT SHELL	1	STAINLESS STEEL,NICKEL(40u" MIN) UNDER PLATING OVERALL.	
6	IN SHELL	1	STAINLESS STEEL,NICKEL(40u" MIN) UNDER PLATING OVERALL.	
5	O-RING	1	SILICONE	
4	EMI	1	STAINLESS STEEL,NICKEL(40u" MIN) UNDER PLATING OVERALL.	
3	MID PLATE	1	STAINLESS STEEL.	
2	TERMINAL	24	COPPER ALLOY,NICKEL(50u" MIN)UNDER PLATING OVERALL, TIN(100u" MIN.) PLATING ON SOLDER AREA, AU(GOLD FLASH) PLATING ON CONTACT AREA	
1	INSERMOLD	1	HIGH TEMPERATURE RESISTANT PLASTIC.	UL94V-0

GENERAL TOLERANCE	ANGLE TOLERANCE
X.± 0.35	X°± 5.0°
.X± 0.30	.X°± 3.0°
.XX± 0.25	.XX°± 2.0°
.XXX± 0.20	.XXX°± 1.0°

MATL SEE BOM
FINISH SEE NOTES
SCALE 1:1 UNIT mm
SHEET 1 OF 1

DRAWN	Joy	DATE 12/10/21'
CHECKED	Joy	DATE 12/10/21'
APPROVED	Terry	DATE 12/10/21'

genesis connected solutions

TITLE: WATERPROOF 24 PIN TYPE C CH1.00mm CONNECTOR
PART NUMBER: 210-10196-01
DRAWING NO. 210-10196
SIZE A4
REV. X6

1 SCOPE

This specification covers the performance requirements of the WATERPROOF USB 3.1 TYPE C FEMALE CL1.00mm HYBRID TYPE

2 APPLICATION DOCUMENT

This following documents form a part of this specification to this extent specified herein. In the event of conflict between the requirements of the specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

- EIA-364

3 REQUIREMENTS

3.1 DESIGN AND CONSTRUCTION

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing

3.2 MATERIAL

A. Housing ： LCP,.BLACK,UL94V-0
B. Contact ： Brass, Nickel under plating overall, Tin plating on solder area, Gold Flash plating on contact area;
C. Shell ： SUS, Nickel 40u'' plating overall;

D. Cover Shell : SUS, Nickel 40u'' plating overall;
E. MD Shell : SUS Wash
F. Inner Shell : SUS Wash

3.3 RATINGS

A. Current rating ： 5A for collectively power supply pin (pin A1,A4,A9,A12,B1,B4,B9,B12); 1.25A for Vconn pin; 0.25A for other signal pin.
B. Voltage rating ： 20V AC OR DC Maximu.
C. Operating temperature ： -40℃ to +85℃

3.4 STORAGE CONDITIONS

Temperature： -25℃~+85℃; Humidity ： ≤80%

3.5 CONDITION OF REFLOW AND BY HAND

Pb-free reflow profile requirements:

Parameter	Reference	Specification
Average temperature gradient in preheating		2.5°C/s
Soak time	T soak	2-3 minutes
Time above 217°C	t1	60 s
Time above 230°C	t2	50 s
Time above 250°C	t3	5 s
Peak temperature in reflow	T peak	255°C (–0/+5°C)
Temperature gradient in cooling		Max -5°C/s

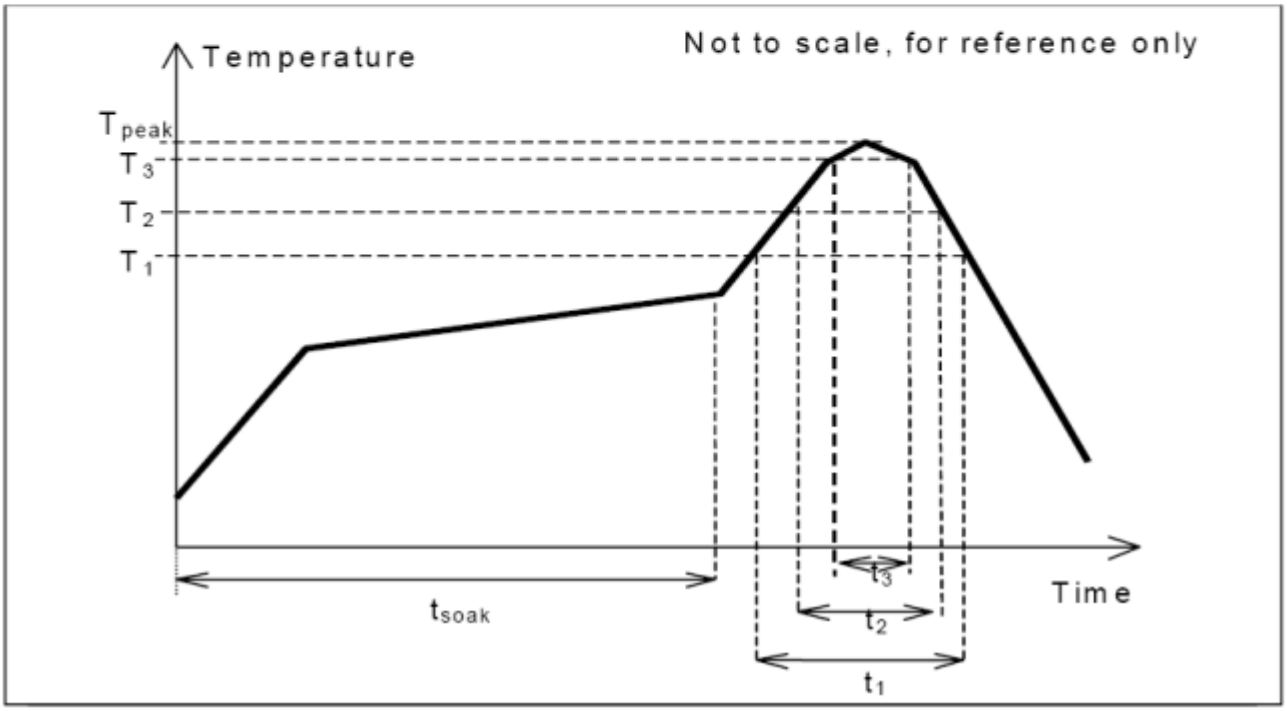


Figure 1

3.6 TEST CONDITIONS

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 2.

3.7 ELECTRICAL PERFORMANCE

Parameter	Requirement	Procedure
Low level Contact resistance 低电平接触阻抗	1. 40 mΩ (Max) initial for VBUS, GND and all other contacts. 2. Maximum change (delta) of +10 mΩ after environmental stresses. 1.电源 PIN、接地 PIN 及其它 PIN 脚接触阻抗均为 40mΩ 最大。 2.产品阻抗变化值不超过 10mΩ。	The low level contact resistance measurement is made from the solder tail of the receptacle to the soldering point of the plug. when measured at 20mV Max. a circuit at 100mA. Mated test contacts must be in a connector housing. Test reference standard：EIA-364-23B 接触阻抗测量方式从母头的焊脚处至公头的焊脚处。 在开路最大电流为 100mA 电压为 20mV 情况下测试胶芯插入时端子之间接触处的阻抗值。 测试参考标准：EIA 364-23B
Insulation Resistance 绝缘阻抗	100 MΩ Min. 100 MΩ 最小	Test between adjacent circuits Insulation Resistance of unmated and mated connectors. Test reference standard：EIA 364-21. 测试对插的连接器两个相邻端子之间的绝缘阻抗值。 测试参考标准：EIA 364-21Ω
Dielectric Strength 耐电压	No breakdown shall occur. 产品不能出现衰竭、损坏现象。	when 100 Volts AC (RMS) is applied between adjacent contacts of unmated and mated connectors. Test reference standard：EIA-364-20. 使用 100V 交流电压测试公母头插入与拔出时相邻端子之间的承受电压情况。 测试参考标准：EIA 364-20
Temperature rise	1.A current of 5.0 A shall be applied collectively to VBUS pins (pins A4, A9, B4, and B9) 2.1.25 A applied to the VCONN pin (B5 of the plug connector) with the return path through the corresponding GND pins (pins A1, A12, B1, and	When the currents are applied to the contacts, the temperature rise shall not exceed 30 °C at any point on the USB Type-C mated plug and

	B12). 3. A minimum current of 0.25 A shall also be applied individually to all the other contacts. 1.VBUS pins 需通过电流 5.0A(pin A4, A9, B4, and B9)。 2. VCONN pin(公头 B5 pin)及 GND pins 需通过电流 1.25A(pins A1, A12, B1, and B12)。 3.其余 pins 需通过最小电流 0.25A。	receptacle under test, when measured at an ambient temperature of 25 °C. Test reference standard： EIA -364-70 method B 在相对温度为 25℃，当电流通过 USB C type 公母头连接器时，测试 连接器中端子任一点温度不超过 +30℃。 测试参考标准：EIA 364-70 方法 B

3.8 MECHANICAL PERFORMANCE

Parameter	Requirement	Procedure
Insertion Force 插入力	The initial connector insertion force shall be within the range from 5 N to 20 N。 连接器初始插入力需在 5N~20N 范围内。	T Measure the force required to mate connector, At a maximum rate of 12.5mm(0.492") per minute. Test reference standard：EIA-364-13 测试的力必须是相匹配的连接器，插入速度不超过每分钟 12.5mm。 测试参考标准：EIA 364-13
Extraction Force 拔出力	The initial connector Extraction force shall be within the range from 8 N to 20 N,After the durability(10000 mating cycles) test product extraction force in 6N~ 20N. 连接器初始拔出力需在 8N~20N 范围内,产品耐久测试(插拔 10000 次)后拔出力在 6N~20N 范围内。	Measure the force required to mate connector, At a maximum rate of 12.5mm(0.492") per minute. Test reference standard：EIA-364-13 测试的力必须是相匹配的连接器，拔出速度不超过每分钟 12.5mm。 测试参考标准：EIA 364-13
Durability or Insertion/extraction Cycles 耐久或插入拔出次数	The durability rating shall be 10,000 cycles. 耐久测试 10000 次。	The durability test shall be done at a maximum rate of 500±50 cycles per Hour And no physical damage to any part of the connector and cable assembly shall occur. Perform 2,500 plug/unplug cycles. Rotate the receptacle or plug 180 and perform 2,500 plug/unplug

		cycles. Rotate the receptacle or plug 180 and perform 2,500 plug/unplug cycles. Rotate the receptacle or plug 180 and perform 2,500 plug/unplug cycles. Cycle rate of 500 ± 50 cycles per hour . Test reference standard:EIA-364-09 耐久测试速度不超过每小时 500±50 次周期循环，且测试后的产品及线材本身任何部位不能出现损坏。 执行 2500 次插拔循环测试。旋转母座或公头 180 并执行 2500 次插拔循环测试。旋转母座或公头 180 并执行 2500 次插拔循环测试 旋转母座或公头 180 并执行 2500 次插拔循环测试 测试参考标准：EIA 364-09
Vibration 振动	No evidence of physical damage. No discontinuities of 1 uS or longer duration when mated connector during test. 在公母配对测试时不能有明显的物理性损坏及超过 1uS 时间断讯	The connector must be mated test. Test condition: Duration: 15 minutes in each (Total of 45minutes) X, Y, Z axis. Amplitude : 1.52mm P-P or 147m/s2 {15G} Sweep time: 50-500-50Hz in 15 minutes. Test reference standard： EIA-364-28, test condition VII 连接器需对插进行测试 测试条件： 持续时间:15 分钟/X,Y,Z 轴(共 45 分 钟） 振幅:1.52mm P-P or 147m/s2 {15G} 扫描时间:50-500-50Hz 15 分钟 测试参考标准:EIA 364-28 条件 VII

3.9 ENVIRONMENTAL PERFORMANCE

Parameter	Requirement	Procedure
Cyclic temperature and humidity 恒温恒湿	Shall meet visual requirements, show no physical damage. Contact Resistance (Low Level) 50 mΩ max. Dielectric Strength should be OK, Insulation Resistance should be 100 MΩ min. 产品外观良好，无损坏。接触阻抗：50 mΩ 最大；耐电压测试 OK, 绝缘阻抗 100MΩ 最小。	Test condition :25 °C ±3 °C at 80 % ±3% Relative Humidity and 65 °C ±3 °C at 50 % ±3% Relative Humidity . Ramp times should be 0.5 hour and dwell times should be 1.0 hour . Duration : 72Hours, Circulate test: 24 Cycles. 测试条件：温度 25C ±3 °C 相对湿度 80 % ±3%及 65 °C ±3 °C 相对湿度 50 % ±3%,温湿度变化需时间为 0.5H 及稳定后需保持 1 小时。 持续时间：72 小时,循环测试:24 次 测试参考标准：EIA 364-31。
Thermal shock 冷热冲击	Shall meet visual requirements, show no physical damage. Contact Resistance (Low Level) 50 mΩ max. Dielectric Strength should be OK, Insulation Resistance should be 100 MΩ min. 产品外观良好，无损坏。接触阻抗：50 mΩ 最大；耐电压测试 OK, 绝缘阻抗 100MΩ 最小。	Temperature range from -55°C to +85° C .Start from -55°C. After 30 min. change to +85°C, change time is no more than 5 minutes. Total 5 cycles. Test reference standard: EIA-364-32 test condition I 温度变化范围：-55°C ~ +85°C，从-55°C 开始，30 分钟后换到 +85°C；转换时间不超过 5 分钱；共 10 个循环。 测试参考标准：EIA 364-32 测试条 件 I
Solderability 可焊性	The inspected area of each lead must have 95% solder coverage Minimum. 检测焊接端的锡覆盖率需大于 95%	Solder pot temperature: 250±5℃ Soldering time: 3 to 5 Seconds Test reference standard: EIA 364-52 锡炉温度:250±5°C,焊接时间:3~5 秒 测试参考标准：EIA 364-52。
Hot air reflow or IR reflow for SMT curing process SMT 热风回流焊	More than 95% of the dipped surface shall be wet with solder 超过 95%的焊接面积浸到锡。	Place subjected connector on the PCB Board and expose them to the reflow

		oven and apply the following condition： Room 1: preheat temperature 150℃ - 170℃ for 100 seconds. Room 2: preheat temperature 170℃－ 200℃ for 100 seconds. Room 3: reflow temperature 200℃ - 255℃ for 120-60 seconds. (For 255℃ ONLY 5-10 seconds) 将产品放在 PCB 板上,然后放入回焊 炉中并用于以下条件： 时间段 1：预热温度 150℃-170℃ 100 秒。时间段 2：预热温度 170℃ - 200℃ 100 秒。时间段 3：回焊炉温 度 200℃ - 260℃ 100 秒。(255℃ 时 间仅 5~10S)
Salt Spray 盐雾测试	Shall meet visual requirements, No detrimental corrosion allowed in contact area and base metal exposed. 产品外观良好，端子及外壳金属无生锈、腐蚀及露底材不良。	Subject mated connectors to 35+/-2 ℃ and 5+/-1% salt condition for 48 hours. After test, rinse the sample with water and recondition the room temperature for 1 hour. Test reference standard:EIA-364-26B. 测试的连接器需放于温度 35±2°C，盐水浓度(重量比)5±1%的容器中测试 48 小时。测试后的产品使 用清水冲洗后放入常温下 1 小时。 测试参考标准：EIA 364-26。

Figure 2

4.0 PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE

TABLE II: PRODUCT QUALIFICATION TEST SEQUENCE

Test Description	*Test Group*								
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Confirmation of Product	1,7	1,9	1,7	1,6	1,13	1,3	1,3	1,5	1,3
Low level Contact resistance	2,6	2,6,8	2,6	2,5	4,10			2,4	
Insulation Resistance					3,12				
Dielectric Strength					2,11				
Temperature rise									2
Insertion Force/ Extraction Force	3,4	3,4	3,4	3,4	5,6,8,9				
Durability	5				7				
Vibration			5						
Cyclic temperature and humidity		7							
Thermal shock		5							
Hot air reflow or IR reflow for SMT curing process						2			
Solderability							2		
Salt Spray								3	
Number of Sample	5 Set	5 Set	5 Set	5 Set	5 Set	5 Set	5 Set	5 Set	

NOTE：
a）Numbers indicate sequence in which tests are performed.
b）Discontinuities shall not take place in this test group, during tests.

Figure 3

4.0 PRODUCT PACKAGE DRAWINGS

4.1 Product to be supplied in tray as shown in product drawing unless otherwise specified.

4.2 Test packaging according to standard ISTA shipping specifications.

5.0 QUALITY ASSURANCE PROVISIONS

5.1 Test Conditions:

A. Sample Selection

Connector housings and contact shall be prepared in accordance with applicable instruction sheets and shall be selected from current production. All test groups shall each consist of a minimum of 5 connectors.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3.

5.2 Requalification Testing:

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate qualification testing, consisting of all or original testing sequence as determined by development/product, quality and reliability engineering.

5.3 Acceptance:

Acceptance is based on verification that product meets requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify. When a product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before submittal.