



Tecnolab del Lago Maggiore s.r.l.  
Via dell'Industria, 20  
28924 Verbania Fondotoce (VB) – Italia

**TEST REPORT RP005808**

**Sinusoidal vibration test on  
electrical connectors**

29/04/2008

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**CLIENTE**  
Customer

**SHIELD s.r.l.**  
Strada Provinciale, 21/A  
28010 Cavaglietto (NO)

**COMMESSA**  
Contract

**CO006908 - 23/04/2008**

**RAPPORTO DI PROVA**  
Test Report

**RP005808**

**Sinusoidal vibration test on electrical connectors**

**NORME DI RIFERIMENTO**  
Applicable standards

- **IEC 60512-4 (ed. 1976):** "Electromechanical components for electronic equipment; basic testing procedures and measuring methods. Part 4: Dynamic stress tests".

**29/04/2008**

ing. Daniele Crispino

ing. Daniele Crispino

ing. Michele Setaro

Data  
Date

Redazione  
Redaction

Verifica Tecnica  
Technical Check

Autorizzazione  
Authorization



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**1. GENERAL REMARKS**

**1.1 Customer data**

Customer:	SHIELD s.r.l.
Address:	Strada Provinciale, 21/A 28010 Cavaglietto (NO)

**1.2 Identification of equipment and/or subsystem under test (EUT)**

EUT (equipment or subsystem) nr°:	1
Manufacturer and model:	SHIELD – M12
Serial number:	n/d
Acceptance code:	AC01201/1
Receiving date:	26 July 2001
Description:	Connector M12 male 90° with milled ring nut

EUT (equipment or subsystem) nr°:	2
Manufacturer and model:	SHIELD – M12
Serial number:	n/d
Acceptance code:	AC01201/2
Receiving date:	26 July 2001
Description:	Connector M12 female 90° with dodecagonal ring nut

**1.3 Test sample**

Test results shown in this Test Report only refer to the sample under test

**2. SCOPE**

Purpose of the swept sinusoidal vibration is to verify product performance during exposure to vibration stress. Tests will verify absence of mechanical damage and unscrewings of ring nuts.

**3. DOCUMENTS**

**3.1 Reference standards**

Rule
➤ <b>IEC 60512-4 (ed. 1976):</b> Electromechanical components for electronic equipment; basic testing procedures and measuring methods. Part 4: Dynamic stress tests



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#### 4. EUT FUNCTIONAL DESCRIPTION

EUTs are electrical connectors. Two of these (the ones with milled ring nut) are connectors “male-type”; the ones with dodecagonal ring nut are “female-type” connectors.

##### 4.1 Modality of fixing EUTs during tests

During tests, EUTs are fixed to a square aluminium plate, made according standard IEC 61076-2-101/CD (see annex n° 2).

##### 4.2 Modality of check before tests

Before tests, connectors are screwed up by hand. To verify absence of unscrewing we made some signs with a marker (see annex nr. 3) to see alignment between fixed part (aluminium plate) and rotating part (ring nut). In case of unscrewings, signs should not be aligned more.

##### 4.3 Modality of check during tests

During tests the EUTs are observed to check absence of unscrewing of ring nuts.

##### 4.4 Modality of check after tests

At the end of tests is verified alignment of signs (made with marker) and checked screwing up of ring nuts by hand.

##### 4.5 Test set-up

During the tests the EUTS were fixed to a square aluminium plate, during the tests on Y and Z axis, the EUT is rotated of 90° (see concerning annexes).

#### 5. TECHNICAL COMPETENCE

Technicians qualified for the execution of the tests are dipl. engineers with at least three months of experience in Measurements and Testing.

#### 6. PERFORMED TESTS

##### 6.1.1 List of tests and results

Test	Acceptance Code of EUT	Result
Sinusoidal vibration	AC012001/1 AC012001/2	No unscrewings detected

##### 6.2 General

##### 6.3 Test site

Tests have been performed at Tecnolab del Lago Maggiore, Via dell'Industria 20, 28924 Verbania Fondotoce (VB).



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**6.4 Sinusoidal vibration test**

<b>Test date:</b>	from 28 <sup>th</sup> July 2001 to 30 <sup>th</sup> July 2001
<b>Reference standard:</b>	IEC 60512-4
<b>Environmental conditions:</b>	T = 29 °C U.R. = 49 %
<b>Test lever:</b>	Frequency range: 10 ÷ 500 Hz 10 ÷ 59,57 Hz: Fixed displacement: 0,35 mm 59.57 ÷ 500 Hz: Fixed acceleration: 5 g Sweep rate: 1 oct/min N° of sweeps: 10 Direction: axis X, Y, Z
<b>Accelerometers set-up:</b>	Two accelerometers was used during tests. Accelerometer 1 (CHAN1) is placed in the centre of vibration table, accelerometer 2 (CHAN2) is placed on the fixture of connectors. Vibration level on CHAN1 is controlled by setting values and measured by CHAN2. This level is reduced if other channel level rise the setting limit (5 g). This control method ensures absence of undesired proddings for the EUTs.
<b>Test procedure:</b>	Signals from measuring accelerometers were processed in order to obtain frequency response curves. Sequence of the tests: X axis, Y axis and Z axis.
<b>Test set-up:</b>	See annexes nr. 1, 2, 3, 4
<b>Test profiles:</b>	See annexes nr. 5, 6, 7

**6.4.1 Test results**

During and after tests, no unscrewings of ring nuts are detected.

**7. TEST INSTRUMENTATIONS**

Code	Type	Manufacturer	Model	Calibration date	Certificate nr.
ST VIB 001	vibration system	LDS	V830T	n/a	n/d
ST VIB 002	accelerometer	DYTRAN	3122C	19/04/2001	SIT 3674
ST VIB 003	accelerometer	DYTRAN	3101BG	19/04/2001	SIT 3676-3677
ST VIB 004	accelerometer power pack	DYTRAN	4105B	19/04/2001	SIT 3676-3677
ST VIB 007	controller	LDS	DVC4000	24/02/2000	50567/1
ST VIB 006	amplifier	LDS	SPA10K	n/a	n/d
ST SCA 006	thermohygrometer	TESTO	615	24/10/2000	RT005900

**8. ANNEXES**

Nr.	Title
1	Vibration system
2	Test set-up
3	Check for unscrewing
4	Test set-up (X axis)
5	Test set-up (Y axis)
6	Test set-up (Z axis)
7 - 8	Test profile (X axis)
9 - 10	Test profile (Y axis)
11 - 12	Test profile (Z axis)





