



# PRODUCT SPECIFICATION FOR PASSIVE SAFETY POLE PLUG

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1.0 SCOPE

This specification defines the performance for the 93175 Passive Safety Pole plug connector.

2.0 PRODUCT DESCRIPTION

(1) 93175-0001 Passive Safety Connector:

This assembly consists of a male and female connector with lengths of cable attached.

For materials, plating & markings see sales drawings SD-93175-001.

Figure 1 below shows the circuit layouts available

3 Pole	4 Pole	5 Pole	6 Pole	16 Pole
AWG 12 / 13 Amps	AWG 12 / 10 Amps	AWG 12 / 8 Amps	AWG 12 / 8 Amps	AWG 16 / 3 Amps
BSEN 60309-1 Series 2, 13 Amps	BSEN 60309-1 Series 2, 10 Amps	BSEN 60309-1 Series 2, 8 Amps	BSEN 60309-1 Series 2, 8 Amps	BSEN 60309-1 Series 2, 3 Amps

Fig1. Circuit Layouts

Note: For higher power applications option's are available for the 3, 4, 5 & 6 Circuit variants please contact the Product Manager.

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3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings SD-93175-001 and other sections of this specification for the relevant reference documents and specifications. In cases where the specification differs from the product drawings, the product drawings take precedence.

4.0 RATINGS

4.1	Current	See Fig1
4.2	Voltage	200/250V AC
4.3	Operating Temperature Range	-20°C to +80°C
4.4	Storage Temperature Range	-40°C to +85°C
4.5	Storage Humidity Range	+15% to +70% RH

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5.0 ELECTRICAL PERFORMANCE

Test Ref.	Item	Test Condition	Requirements
5.1	Contact Resistance EIA-364-23 C	Measure contact resistance across the interface between the plug terminals in the male and female pole plug connector, using a circuit of 20mV, 100mA Max. See Appendix 1	Initial Value 25 mΩ Max After tests maximum increase = 20mΩ Initial value includes bulk resistance due to terminal
5.2	Insulation Resistance BSEN 60309-1-19.2	Mated & Unmated connector with 1000V DC between adjacent contacts for 1 minute	5MΩ Min.
5.3	Dielectric Strength EIA-364-20 D	Unmated connector with 2000V AC between adjacent contacts for 1 minute	No voltage breakdown
5.4	Temperature Rise BSEN 60309-1-22	Measured at 13 A for 3 circuit, 10 Amps for 4 circuit, 8 Amps for 5 Circuit, 8 Amps for 6 Circuit layouts and 3 Amps for 16 Circuit layout	After test, Max. allowable increase from ambient temperature 50°K
5.5	Breaking Capacity BSEN 60309-1-20	The connector is cycled at 7.5 strokes a minute, electrical contact will be maintained between 2 and 4 seconds and the connectors will be separated by a minimum of 50 mm per cycle. Test performed at 1.1 times the rated voltage and 1.25 the rated current.	No sustained Arching should occur There shall be no damage to contacts impairing the future use There shall be no serious damage to the connector housings

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6.0 MECHANICAL PERFORMANCE

See section 13.0 for test sequence.

Test Ref.	Item	Test Condition	Requirements
6.1	Durability between Male and Female connectors EIA-364-09	Cycle parts by hand to TBD cycles.	Appearance: No physical damage Contact resistance after 50 cycles Delta R < 20mΩ
6.2	Retention force between Male and Female connectors EIA-364-29 C	Unmate male and female connectors using tethers provided See Appendix 2	80N Min.
6.3	Glow Wire BSEN 60309-1-27	See Test Standard section 27 See Appendix 3 for test setup	See standard
6.4	Terminal Pull force BSEN 60309-1-11.8/9	A terminated terminal shall be subjected to a pull force of 50N for a duration of 1 Min	The conductor shall not slip or break from the terminal
6.5	Cable Pull Test BSEN 60309-1-23.3	A connector is to be subjected to a pull force of 80 N 100 times with a duration of 1 second each time, immediately afterwards the cable is subjected to a torque force of 0.35Nm for 1 min, cable length 0.5 m See Appendix 4	Appearance: No physical damage  The cable shall not have moved more than 2 mm
6.6	Impact Test BSEN 60309-1-24.3	The connector is dropped onto a concrete floor 8 times rotating 45° after each test See Appendix 5	Appearance: No physical damage
6.7	Flex Test BSEN 60309-1-24.4	The connector is subjected to a 20N load and the cable is then flexed backwards and forwards 90° (45° either side of vertical) 2000 times at a rate of 60 flexes a minute See Appendix 6	No Discontinuities

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7.0 ENVIRONMENTAL PERFORMANCE

Test Ref.	Item	Test Condition	Requirements
7.1	Dry cold (steady state) IEC 60068-2-1Ab	-40°C for 96 hours  Recovery: 2 hours at ambient atmosphere	Appearance: No damage  Delta R < 20mΩ
7.2	IP68 IEC 529	Test to a depth of 1.5 m for 1 Hr Dust ingress as per IEC 529 "parts should be tested and reviewed as installed in the ground, female connector on the bottom"	Visual inspection No water or dust ingress "Note water droplets on housing side surfaces do not constitute a fail as this can occur during unmating"
7.3	Thermal Shock IEC 60068-2-14 Test Na	25 Cycles at Ta = -40°C for 0.5hrs; then change of temperature to +25°C for 5 minutes Max.; then Tb = +85°C for 0.5hrs; then cool to ambient.  Recovery 2 hours at ambient atmosphere	Appearance: No damage  Delta R < 20mΩ
7.4	Damp Heat (cyclic) IEC 60068-2-30Db	Temp: 25° to 55°C, RH: 90-100% for 6 cycles of 24 hours each.  The typical cycle in temp 25°C → 55°C in 3 hours; then maintain at 55°C for 9 hours then; 55°C → 25°C in 3 hours; then maintain at 25°C for 9 hours  Recovery 2 hours at 25°C & 75% RH	Appearance: No damage  Delta R < 20mΩ
7.5	Salt Spray IEC 60512-11-6	96 hour spray at 35° ± 2°C & 90-95% RH Salt (NaCl) mist 5%  After test , wash parts and return to room ambient for 1-2 hours	Appearance: No damage  Delta R < 20 mΩ

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Product Specification



LANGUAGE

English

Test Ref.	Item	Test Condition	Requirements
7.6	Vibration / Mechanical Shock ( Electrical) IEC 60068-2-6	10 to 2000 Hz crossover frequency 57 Hz to 62 Hz displacement 1.5 mm 3 axes sweep cycles per direction 5 length of sweeps 15 minutes	Contact Resistance change < 20 mOhms Discontinuity < 1 microsecond
7.7	Watertight test BSEN 60309-1-18.4	24 Hr's @ 0.5 m, Dielectric withstand test immediately after	Visual inspection No water ingress No voltage breakdown
7.8	Marking Legibility BSEN 60309-1-7.6	After humidity treatment the sample is rubbed vigourously by hand for 15`s with a wet cloth, then again for 15`s with a cloth soaked in petrolium spirit.	All markings and logos must be easily legible
7.9	Resistance to rusting BSEN 60309-1-28	Parts are immersed in a 10% ammonium chloride bath for 10 min`s @20°C then removed, Shake off excess moisture and place in a moisture saturated chamber for 10 minutes at 20°C, parts are then dried at 100°C for 10 minutes	Parts shall show no sign`s of rusting
7.10	Resistance to ageing BSEN 60309-1-13	70°C for 240 Hrs for rubber 80°C for 168Hrs for Thermoplastic & allowed to reach room temperature	Materials shall show no signs of cracking or become sticky / greasy.

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**8.0 CRITICAL PARAMETERS**

Critical features are detailed on drawing SD-93175-001

**9.0 GENERAL REQUIREMENTS**

- All materials and plating's are RoHS compliant.
- IP-classification: This component will be used in a product that fulfils IP68 classification according to IEC 60529 for non-active category products.
- Test Sample Size: There shall be 8 parts in each test-group. The only exception is Test 6.3 where 1 sample will be used as per test standard.
- This product meets BS EN 12767 requirements for a passive safety connector.
- This product meets or exceeds BS EN 60309 Part 1, Except test sequence 6.7 "Flex test" which has a reduced number of cycles from 20000 to 2000 as this connector is designed for static applications only.

**10.0 MATERIALS**

All materials are specified in sales drawings SD-93175-001

**11.0 MARKING**

Housings will have MXI & cavity number molded.  
Over-mold's will have the Molex Logo clearly visible as well as the following ratings  
Rated current \*A, 200/250 V, 50/60 Hz's, AC symbol ~, & IP68 classification.

**12.0 PACKAGING & LABELLING**

See packaging specification PK-93175-001 for packaging and labeling requirements for cartons.

Parts shall be packaged to protect against damage during handling, transit and storage.  
No Styrofoam shall be used in any packing that comes in direct contact with the connectors.

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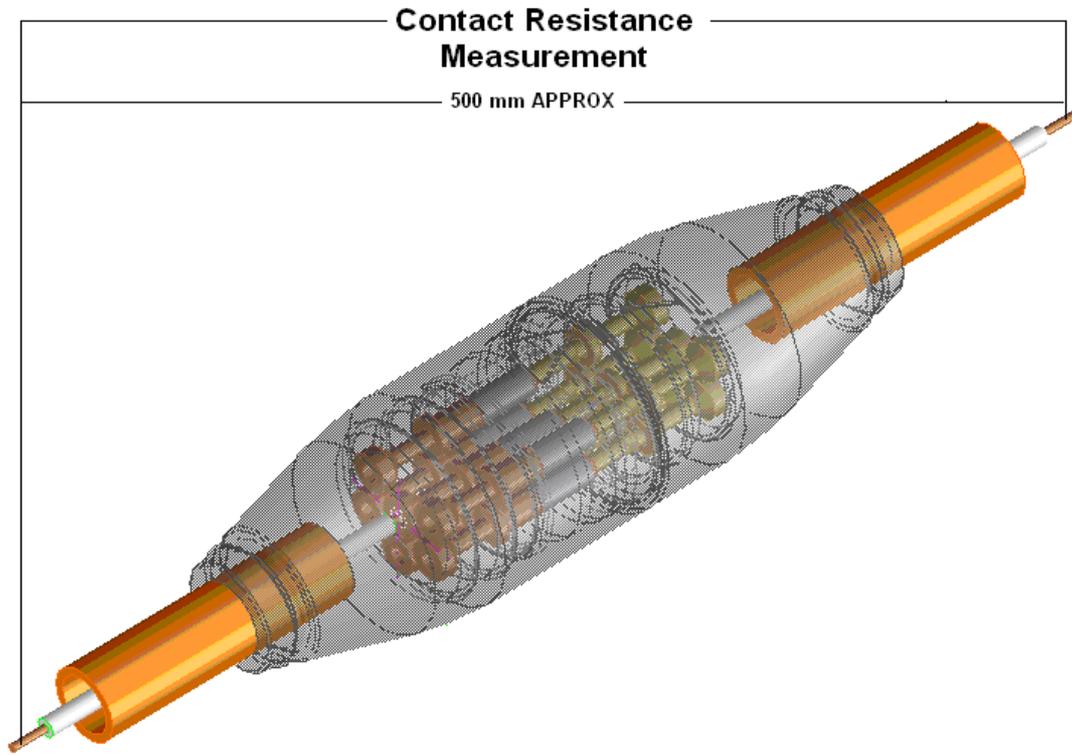
13.0 TEST GROUPINGS

Test Ref.	Test Item	GP1	GP2	GP3	GP4	GP5	GP6	GP7	GP8
5.1	Contact Resistance	1,3	2,4	1,3,5	1,5,7		1,3		
5.2	Insulation Resistance				2,8				
5.3	Dielectric Strength				3,9				
5.4	Temperature rise						2		
5.5	Braking Capacity							1	
6.1	Durability				4				
6.2	Retention force		1,5						
6.3	Glow Wire							1	
6.4	Terminal Pull force							1	
6.5	Cable Pull force							1	
6.6	Impact							1	
6.7	Flex							1	
7.1	Dry Cold	2							
7.2	IP68					1			
7.3	Thermal Shock			2					
7.4	Damp Heat				6				
7.5	Salt Spray			4					
7.6	Vibration test		3						
7.7	Watertight							1	
7.8	Marking Legibility				10				
7.9	Resistance to rust								1
7.10	Resistance to ageing								1

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APPENDIX 1

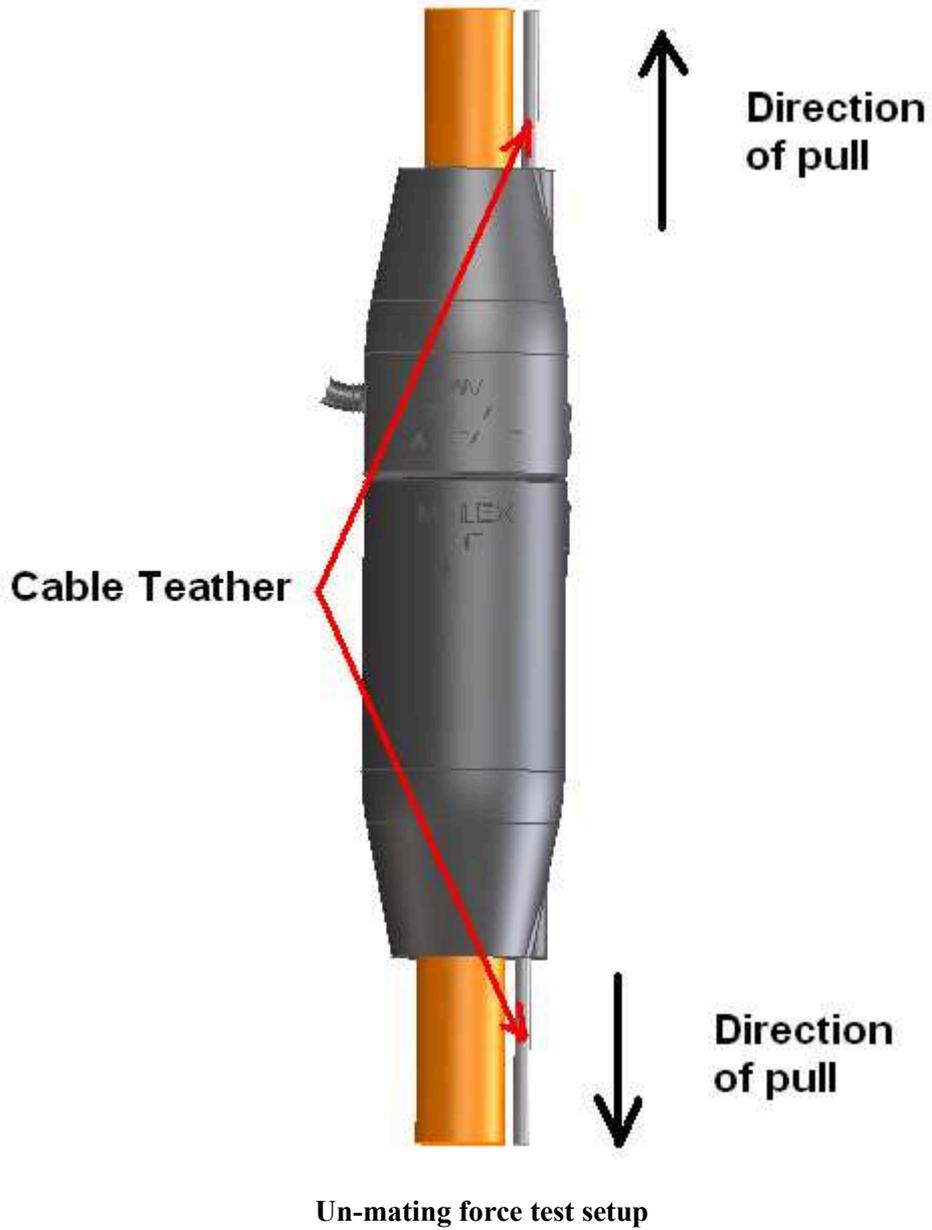


Contact Resistance Set-up

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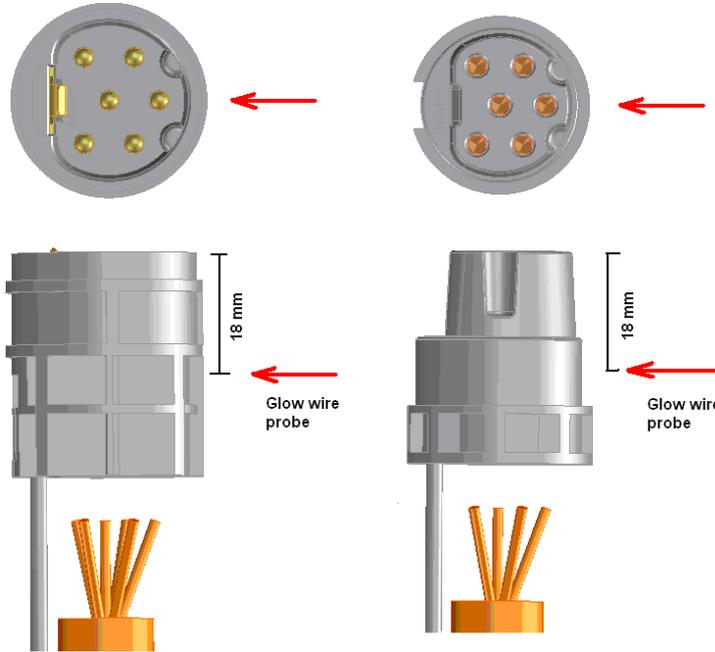
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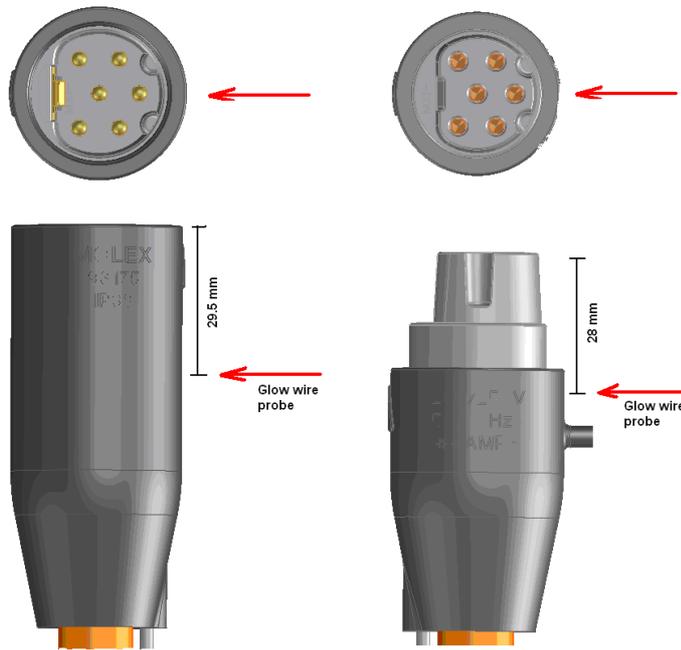
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APPENDIX 3



Glow wire test setup A

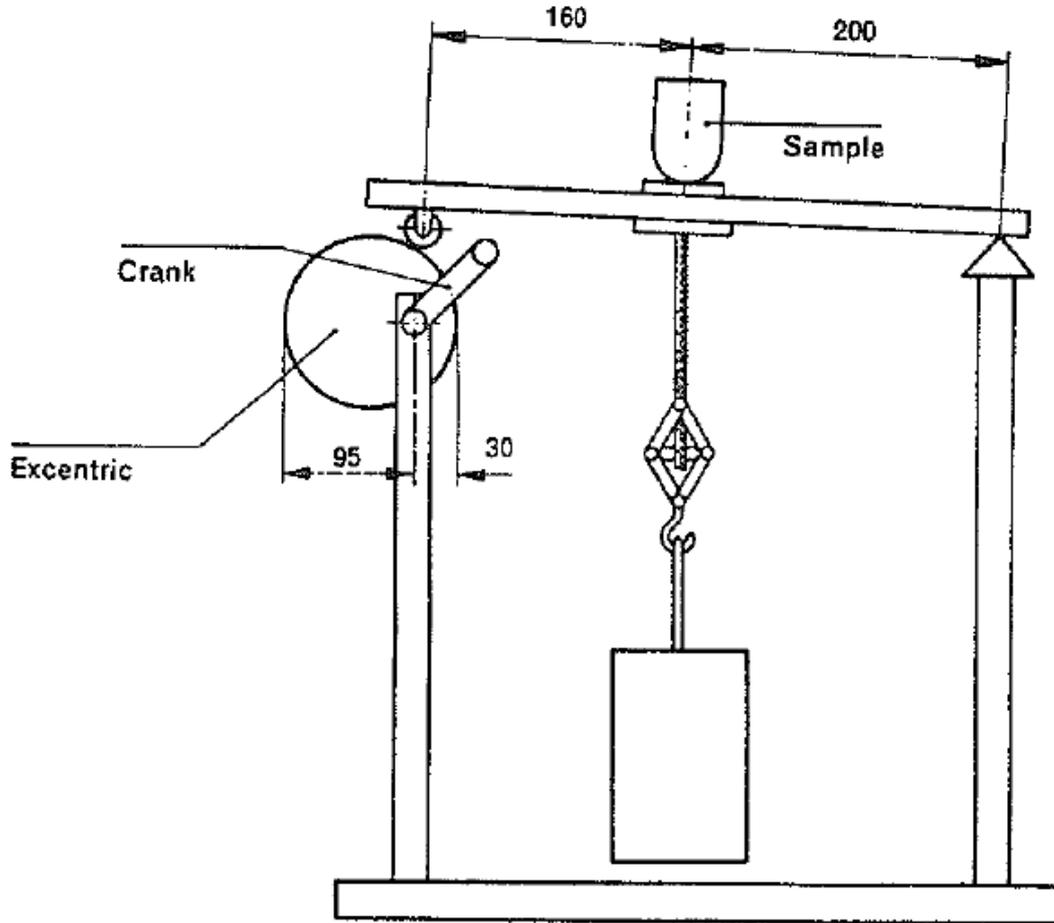


Glow wire test setup B

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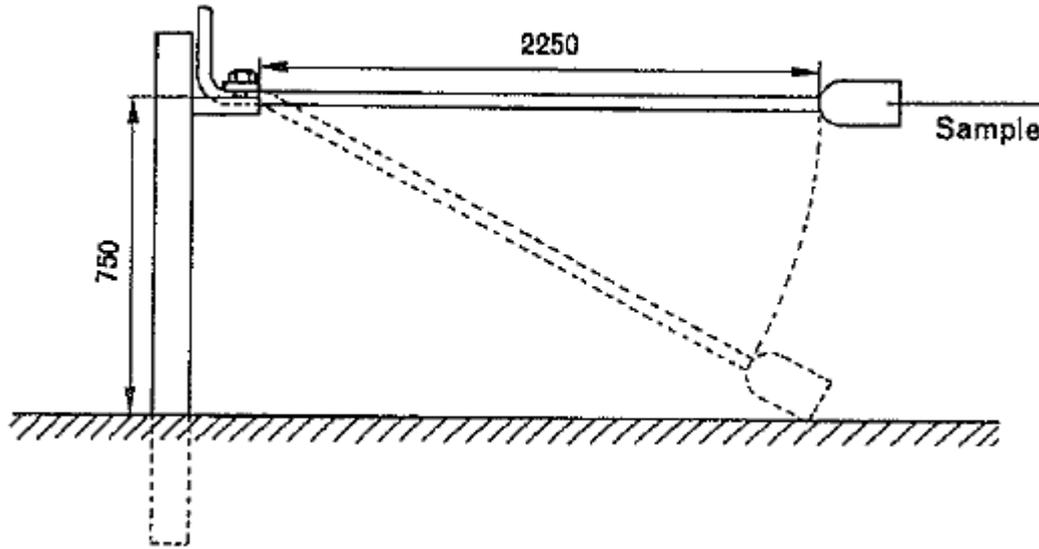


Cable Pull test setup

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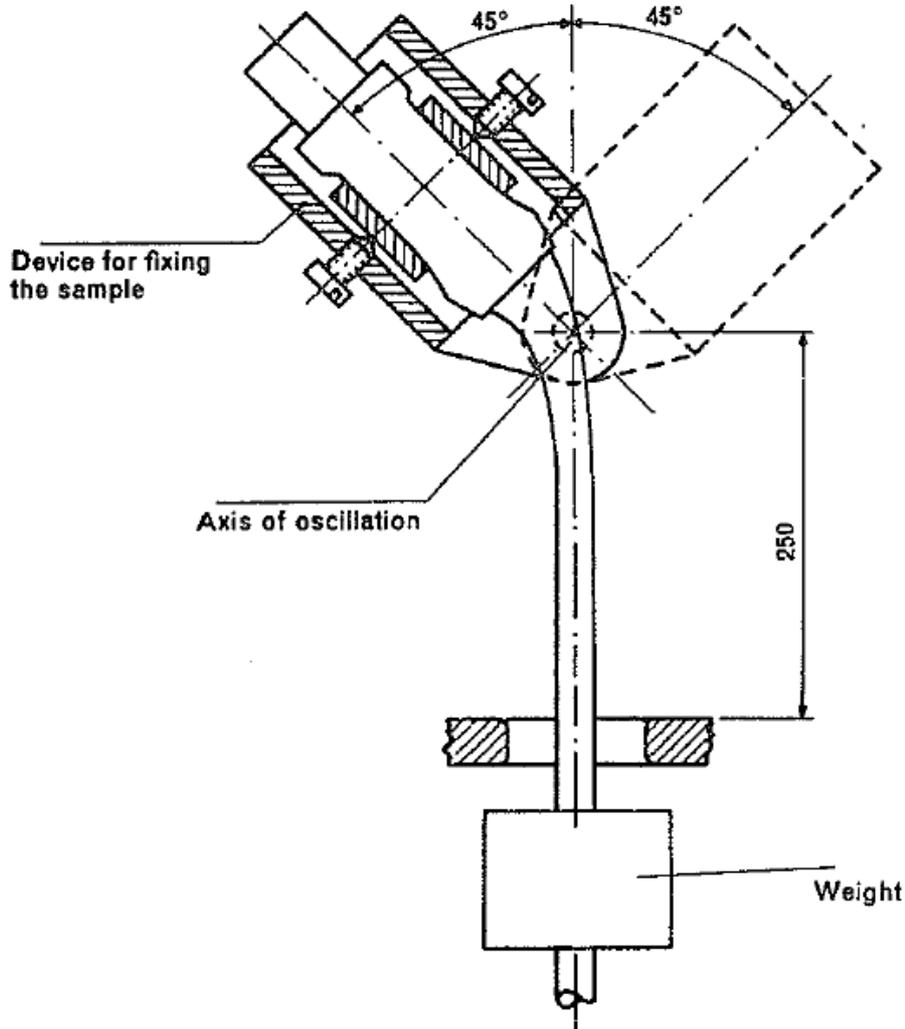


Impact test setup

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APPENDIX 6



Cable flexes test setup

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