



NATIONAL INSTITUTE OF SOLAR ENERGY
(An autonomous Institute of Ministry of New & Renewable Energy)

NOTICE INVITING TENDER
NIT NO: 01/01(15)/2016/NISE-PV

On behalf of Office of the Director General, National Institute of Solar Energy, Gurugram sealed tenders are invited from reputed agencies for supply, installation of Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock Out Test, Robustness of Termination with complete accessories at NISE, Gurugrar. Tender document and instructions for submission of bids may be downloaded from the website of NISE i.e. www.nise.res.in. The last date of receipt of bids will be 12:00 Noon on 28 February 2017.

Tender DOCUMENT

For

Supply and Installation of Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock out Test, Robustness of Termination with complete accessories



NIT NO: 01/01(15)/2016/NISE-PV

Closing Date: 12:00 Noon on 28/02/2017

At

NATIONAL INSTITUTE OF SOLAR ENERGY

Gurugram - Faridabad Road, Gwal Pahari, Gurugram – 122 003, Haryana,

INDIA

Telefax No. : +91-124-285 3095 / 285 3088

National Institute of Solar Energy

Gurugram - Faridabad Road, Gwal Pahari, Gurugram – 122 003, Haryana

TENDER NOTICE

Subject: Supply and Installation of Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock out Test, Robustness of Termination with complete accessories at National Institute of Solar Energy, Gurugram.

On behalf of Office of Director General, National Institute of Solar Energy sealed tenders are invited from reputed agencies in two parts (Technical and Commercial separately) for supply, installation of **Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock Out Test, Robustness of Termination with complete accessories** at National Institute of Solar Energy (NISE), Gwal Pahari, Gurugram – 122 003, Haryana, India. The important dates and information are given below in the table:

Tender Details

S No	Description	Details
1	Notice Inviting Bid (NIT) No	<u>01/01(15)/2016/NISE-PV</u>
2	Scope of work	Supply, Installation and warranty for minimum 1 year, of Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock Out Test, Robustness of Termination with complete accessories with complete accessories at NISE.
3	Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock Out Test, Robustness of Termination with complete accessories	As Per Technical Specification
4	Place of issue & submission of bid document and address for communication # The Envelop should be super scribed as Tender for “Module Breakage system, Accessibility Test System,	NATIONAL INSTITUTE OF SOLAR ENERGY Gurugram-Faridabad Road, Gwal Pahari, Gurugram – 122 003, Haryana, India

	Cut Susceptibility System, Terminal Knock Out Test, Robustness of Termination with complete accessories with ratings ”	Tel :- 0124 – 285 3095 / 285 3088
5	Availability of Tender Document	The Tender document can be downloaded from NISE website: www.nise.res.in
6	Last date & time of submission of bid	28/02/2017 at 12.00 Noon
7	Earnest Money (Refundable)	Rs.30,000/- only (refundable to the unsuccessful bidders without any interest) by way of Demand Draft drawn in favor of “National Institute of Solar Energy” payable at Gurugram (or) by way of Bank Guarantee from any of the scheduled banks
8	Time of supply	Maximum 6 (six) to 8 (eight) weeks, after issue of Purchase Order
9	Validity of offer	The offer will remain valid for 90 days from the date of Bid opening
10	Validity of Earnest Money Deposit (EMD)	EMD is to remain valid for a period of 3 (three) months from the date of opening the bid

DETAILED TENDER NOTICE

Name of Work: Supply and Installation of **Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock out Test, Robustness of Termination with complete accessories with complete accessories at NISE.**

1. ELIGIBILITY CRITERIA

1.1 The original manufacturers or their authorized suppliers who have past experience of manufacturing, or authorized Indian supplier. A list of clients should be enclosed.

2. Technical Specifications:

SPECIFICATIONS OF MODULE BREAKAGE TEST (MBT) SYSTEM FOR PV MODULES

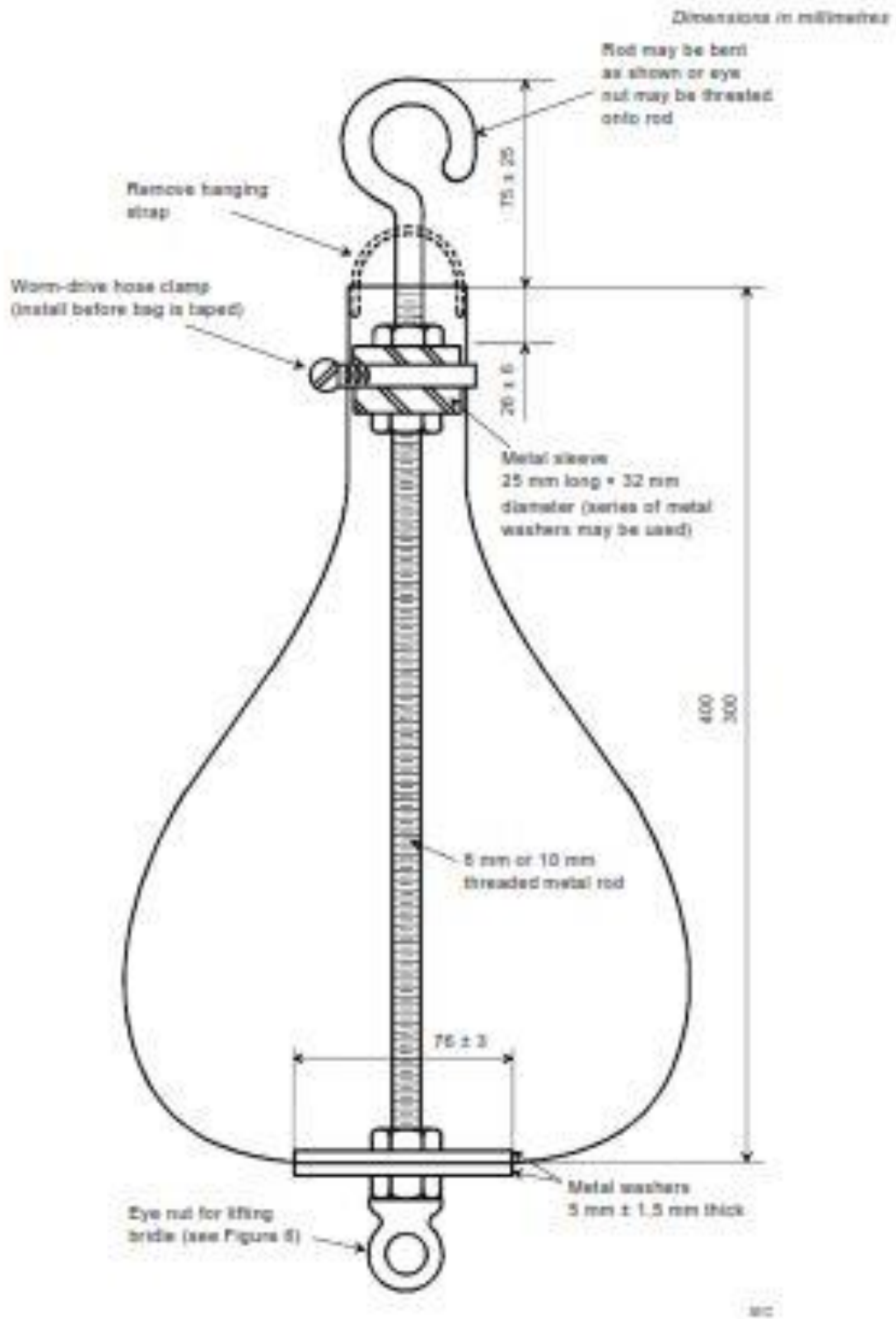
Purpose of MBT test system		I.	The purpose of this test is to provide confidence that risk of physical injuries can be minimized if the PV module is broken in its specified installation.
SL No	PARAMETERS	SPECIFICATIONS	
1.	Scope of work	I.	The MBT system should satisfy the overall criteria of technical specifications and procedure to achieve the purpose of the test on PV module as specified according to 10.21 Module breakage test MST 32 of IEC 61730-2 Edition 2.0 2016-08
2.	PV Module Test Rack	I.	The MBT system should be capable to accommodate PV module with necessary adjustable clamp arrangements to hold and fix for the testing purpose as prescribed in 10.21 of IEC 61730-2 EDITION 2.0 2016-08.
		II.	A test frame similar to that shown in Figure 6 and Figure 7 shall be provided to minimise movement and deflection during testing. The structure framing and bracing shall be steel channel (approximately 100 mm × 200 mm or larger) and shall have a minimum moment of inertia of approximately 187 cm ⁴ . The frame shall be welded or securely bolted at the corners to minimize twisting during impact. It shall also be bolted to the floor to prevent movement during impact testing.

	III.	When the impactor is stationary/at rest the impactor bag shall hang no more than 13 mm from the surface of the PV module sample and no more than 50 mm from the centre of the PV module sample.
	IV.	The MBT system shall have a provision to mount the PV module sample so that it is centred and rigid on the test frame using the method and parts shall need to be described by the manufacturer including a defined torque if screws are used for mounting. Different mounting options shall need to provide, overall criteria of the test shall cover the range of mounting techniques.
	V.	The MBT system should have an adjustable sub frame test rack acc., to size of test specimen as prescribed in Figure 7 Impact test frame 2 of IEC 61730-2 EDITION 2.0 2016-08.
	VI.	The MBT system should supply with an alternate means of bracing frame, use one brace at each vertical member to get concrete wall support through steel beam or other sturdy construction.
	VII.	The MBT system should be fixed to the floor at the time of installation on-site through securely bolt to floor.
	VIII.	The MBT system should supply with an alternate means of bracing frame, use one brace at each vertical member to get ground floor support wall through steel beam or other sturdy construction.
	IX.	The MBT system should supply with an alternate means of bracing frame, use one brace at each vertical member to get wall support through steel beam or other sturdy construction.
3. Impactor	I.	The impactor shall be a bag made of a suitable material and capable to be filled to the required weight using a suitable filling material (e.g. steel balls or pellets). The exterior of the bag shall be wrapped with tape as shown in the Figure 5 in order to avoid uneven surfaces like stitching. When filled, the impactor bag shall have dimensions as described in Figure 5 and a weight of 45.5 kg ± 0.5 kg. The ratio of widest diameter to height shall be between 1:1.5 to 1:1.4
	II.	The distance between the gravity center of impactor and the cord's hanging point shall be ≥1,525mm.

		III.	Impactor should have a provision to position through motor driven cable system.
		VI.	Impactor shall suspended on the test rack by 3mm standard steel cord/cable.
		V.	The impactor should be supplied with a minimum of 3mm Y-cord to connect the upper and lower portion of impactor.
		VI.	The wire-terminal is equipped with round steel ring able to withstand at least 80kg; for the connection of quick-release hook.
4.	Impact Launcher (Crane)	I.	The MBT system should be supplied with a crane capable of lifting impactor to a predefined position with at least two speed control switch along with impactor release switch to launch the impactor over the surface of the test specimen (PV module).
		II.	The crane shall install at rear part of test rack's upper beam. The cord (stranded steel cable) diameter shall be greater than 3mm.
		III.	MBT system shall have a suitable arrangement to Lift the impactor to a drop height of 300 mm from the surface of the PV module sample, allow the impactor to stabilize, and then release it to strike the PV module sample.
		IV.	A two stage impact drop height provision should be provide to lift the impactor to a drop height of 300 mm and 1200 mm
		V.	When an impactor bag is filled with lead shot, it should weigh approximately 45.5 kg, and should be capable to deliver 542 J of kinetic energy when swung through a 1.2 m vertical drop.
		VI	A provision should be provided to measure and record the corresponding velocity and delivered kinetic energy in terms of joules when impactor bag swung through a vertical drop
		VII.	A provision to measure and record the impact velocity with an accuracy of $\pm 5\%$, when the point of strike over the module surface and corresponding measurements shall be recorded and displayed for test results either with pen drive storage option
		VIII	A valid calibration certificate for the velocity of the test equipment should be provided at the time prior to

			commissioning of the MBT system
5	Power supply	I.	1/n/p/ 230V ±10%, 50 ±1HZ. The actual electrical load of the system should be specified.
		II.	Grounding Requirement: Supplier should specify in detail the requirements of the grounding.
		III.	Maximum connected load: Supplier should specify with details sub-system wise load requirements.
		IV.	Maximum current consumption: Suppliers should specify to total KVA load with current details.
6	Other Requirements	I.	Protection types: Electrical/ operating panel IP 21 (or any relevant International Standard)
		II.	A cushion should be provided along with MBT system according to the size of the test specimen to keep on floor, In order to allow measurement of the particles, breakage into smaller pieces which should be avoided to directly dropping on the floor at the time of test.
		III.	A calibrated electronic weighing machine should be supplied having a sensitivity of 0.1g metric can be switched to Kg to measure the impactor weight of 45.5kg
		IV.	A built in stopwatch should be supplied to measure the time taken to strike the test specimen (PV module) from an impact launch position for accurate timing tests.
		V.	A fully movable on wheels and foldable transparent enclosure including barriers should provide to protect against particles ejected from the test specimen.
		VI.	Equipment should be delivered to the laboratory in semi knock-down condition. Components and sub-assemblies should be sent in separately packed conditions so that these can be easily taken in to the laboratory and thereafter assembled.
		VII.	Exterior dimensions of the system along with the space required for operating should be specified in the offer. For any other required clarifications, the designer may refer to clause no.10.21 of IEC 61730-2 EDITION 2.0 2016-08.
		VIII.	On-site acceptance tests should be demonstrated by the supplier using the actual sample modules, as per the standard IEC 61215/61646 AND IEC 61730-2 EDITION 2.0 2016-08. This would also form a part of comprehensive onsite training on operation, maintenance and general servicing of MBT System should be provided. The training should be comprehensive till the completion of all number of impactor strikes specified in the standard.
		IX	MBT system shall have a suitable arrangement to scale (accurate Impactor height) the impactor to a drop height from the surface of the PV module sample

		X When use the impactor to impact the specimen at the height of 1220mm repeatedly for 10 times. The test rack shall not be deformed or no welding path cracked.



Filled bag has a total weight of assembly of 45.5 kg ± 0.5 kg.

Tape bag with 13 mm wide tape use 3 rolls (185 m) and tape in diagonal, overlapping manner. Cover entire surface of bag. Tape neck separately.

Figure 5 – Impactor

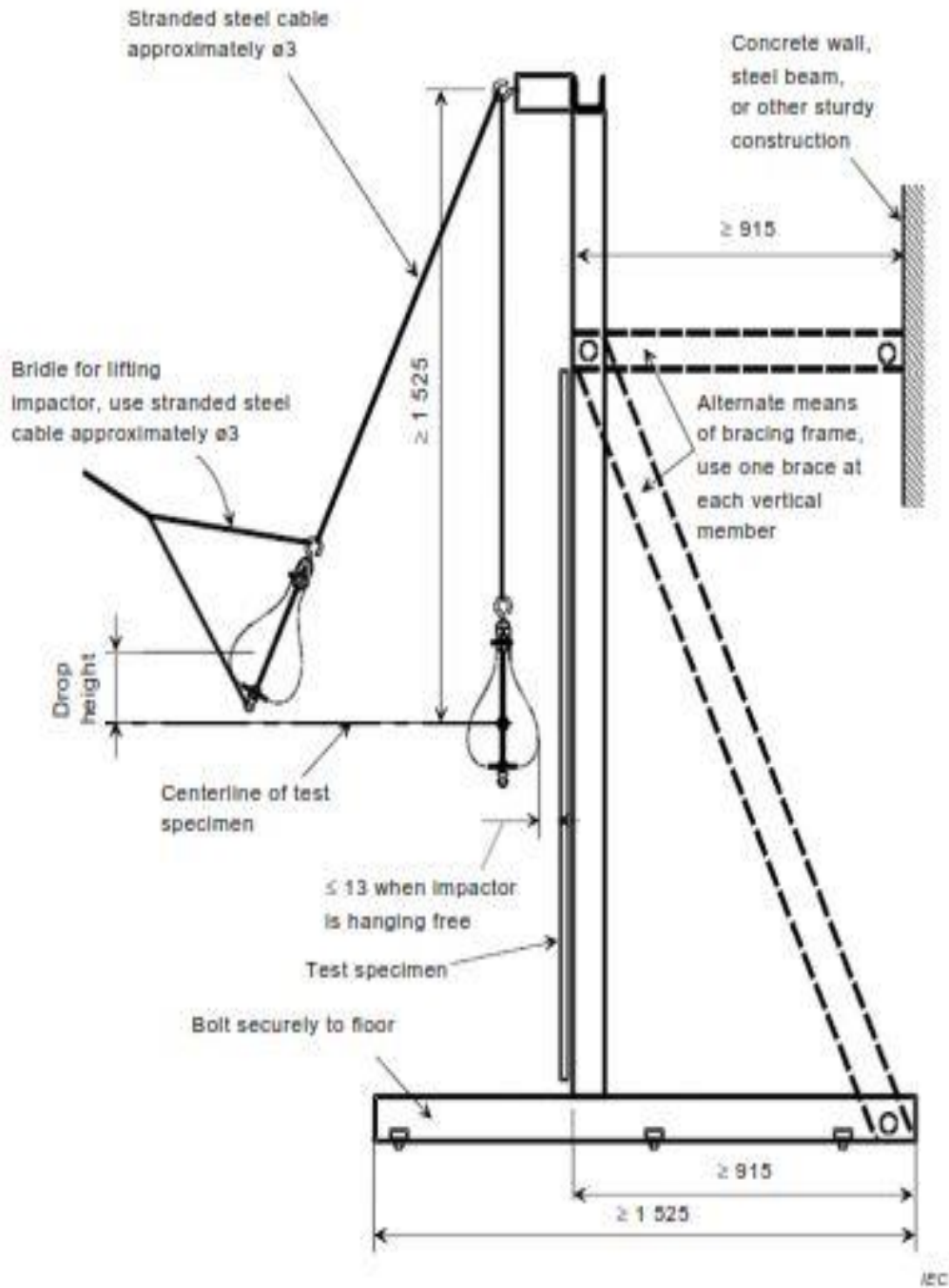
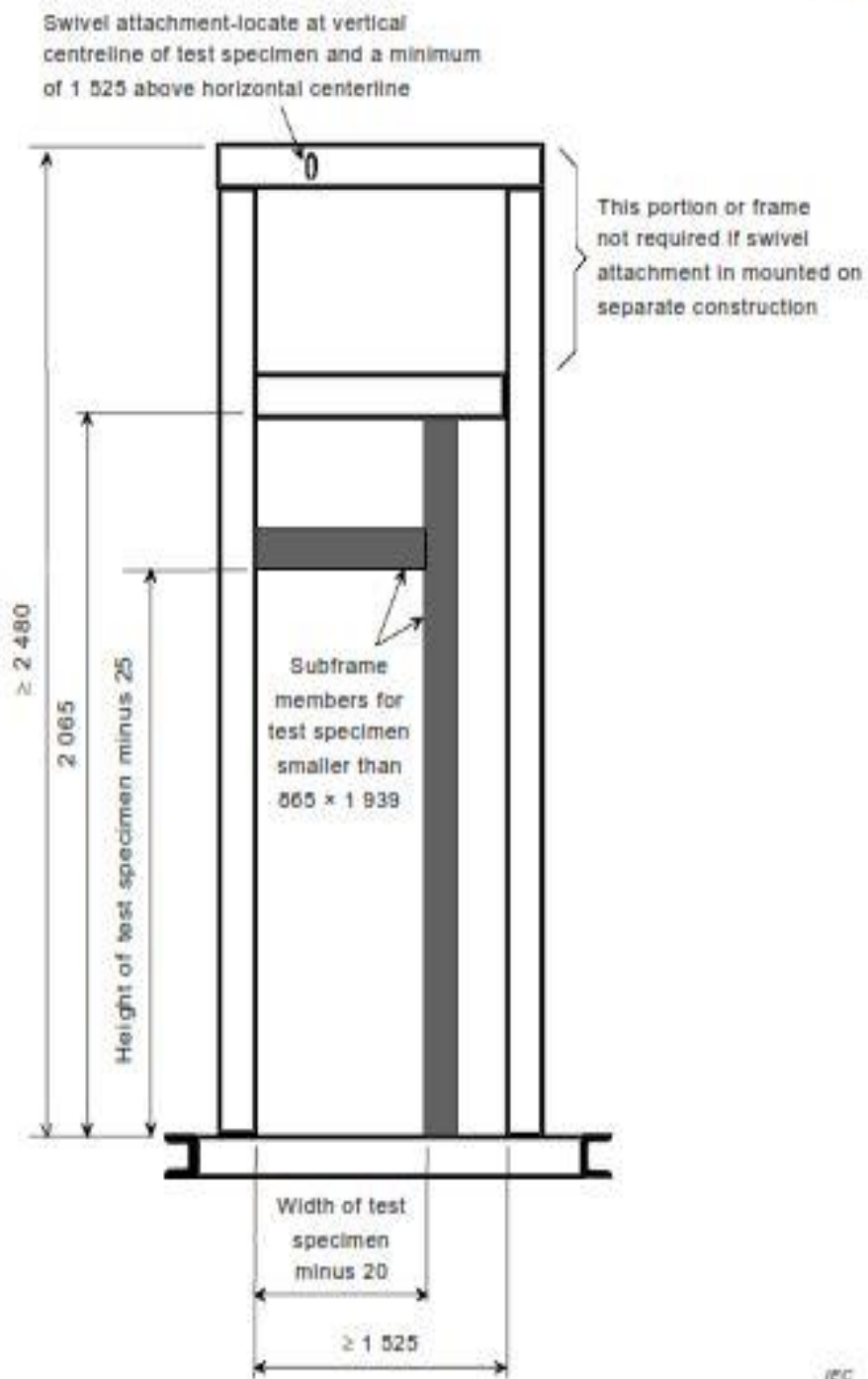


Figure 6 – Impact test frame 1

Dimensions in millimetres



Clamping frame for holding test specimen not shown.

Figure 7 – Impact test frame 2

SPECIFICATIONS OF ACCESSIBILITY TEST (AT) SYSTEM FOR PV MODULES

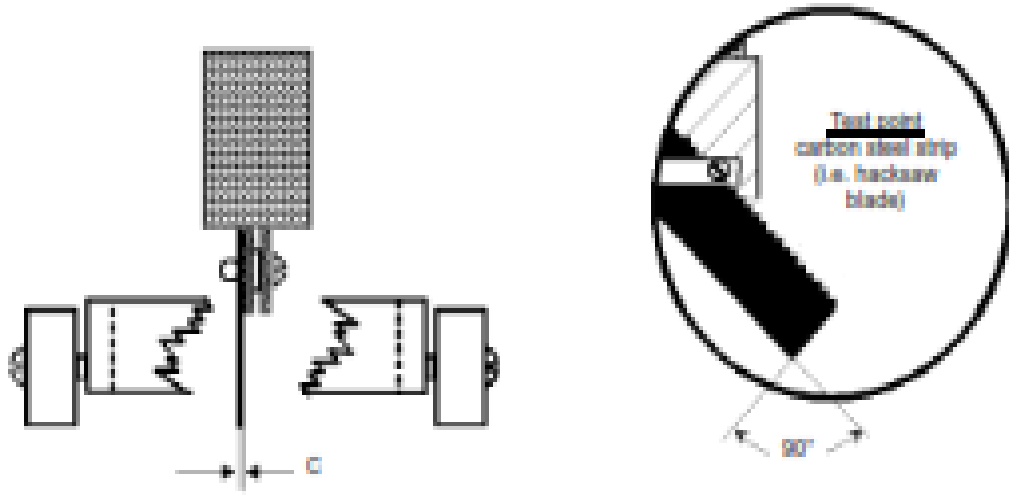
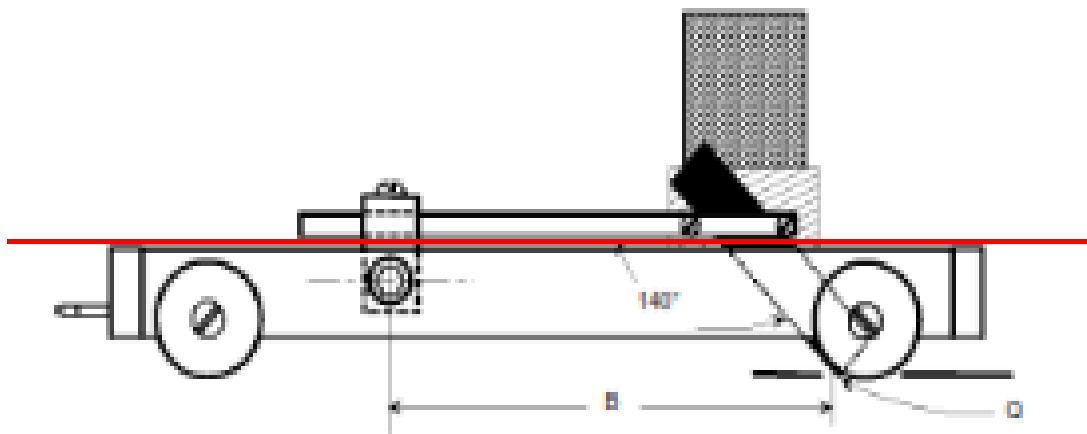
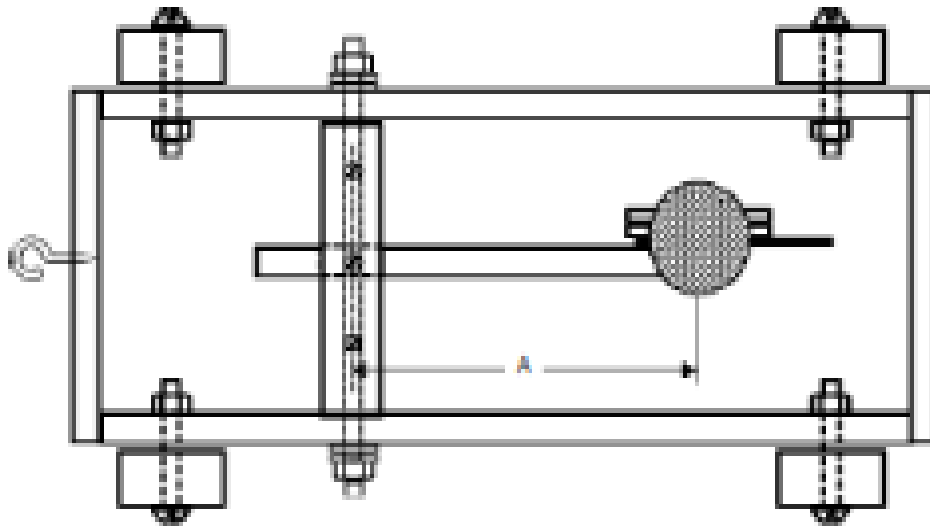
Purpose of Accessibility test system		To determine if PV modules are constructed to provide adequate protection against accessibility to hazardous live parts (> 35 V).
SL No	PARAMETERS	SPECIFICATIONS
1.	Scope of work	The AT system should satisfy the overall criteria of technical specifications and procedure to achieve the purpose of the test on PV module as specified according to 10.9 Accessibility test MST 11 of IEC 61730-2 Edition 2.0 2016-08
1.	Test Finger	<p>I. The AT system should be capable in Verification of accessibility to parts (electrical connectors, plugs, junction boxes and any other areas where the electrical circuit of the module may be accessible) comfortably for the testing of PV Modules as prescribed in 10.9 of IEC 617302.</p> <p>II. The AT system should be a cylindrical test fixture type 11 according to figure 7 of IEC 61032:1997</p> <p>III. The test fixture/finger shall need to apply force of 10 N.</p>
2.	Test figure material	<p>I. The Accessibility test (AT) finger material should be stainless steel of similar shape and size according to figure 7 of IEC 61032:1997</p> <p>II. The AT system handle should be of insulation material</p> <p>III. The AT finger diameter should be 12mm</p> <p>IV. The AT finger length should be 80mm</p> <p>V. The AT finger baffle plate should be 50mm diameter</p> <p>VI. The AT finger baffle plate thickness should be not less than 5mm diameter</p> <p>VII. The AT system shall have well Finishing</p>
3.	Other Requirements	<p>I. Exterior dimensions of the system should be specified in the offer.</p> <p>II. For any other required clarifications, the designer may refer to clause no. 10.9 of IEC 61730-2 EDITION 2.0 2016-08.</p> <p>III. Either an ohmmeter or continuity tester should be supplied along with AT system to check among PV module's short-circuited terminals and to the test fixture.</p> <p>IV. AT system should have a convenient provision to probe with the test fixture in and around all electrical connectors, junction boxes and any other areas where live parts of the PV module may be accessible.</p>

		V.	The ohmmeter or continuity tester the probing to determine if the test fixture makes electrical contact to the PV module electric circuitry live parts.
		VI.	The ohmmeter or continuity tester shall be useful to monitor during the probing to determine if the test fixture makes electrical contact to the PV module live parts.
		VII.	On-site acceptance tests should be demonstrated by the supplier using the actual sample modules, as per the standard IEC 61215/61646 and IEC 61730-2 EDITION 2.0 2016-08. This would also form a part of comprehensive onsite training on operation, maintenance and general servicing of AT System should be provided. The training should be comprehensive till the completion of all number of test patterns specified as per the standard.

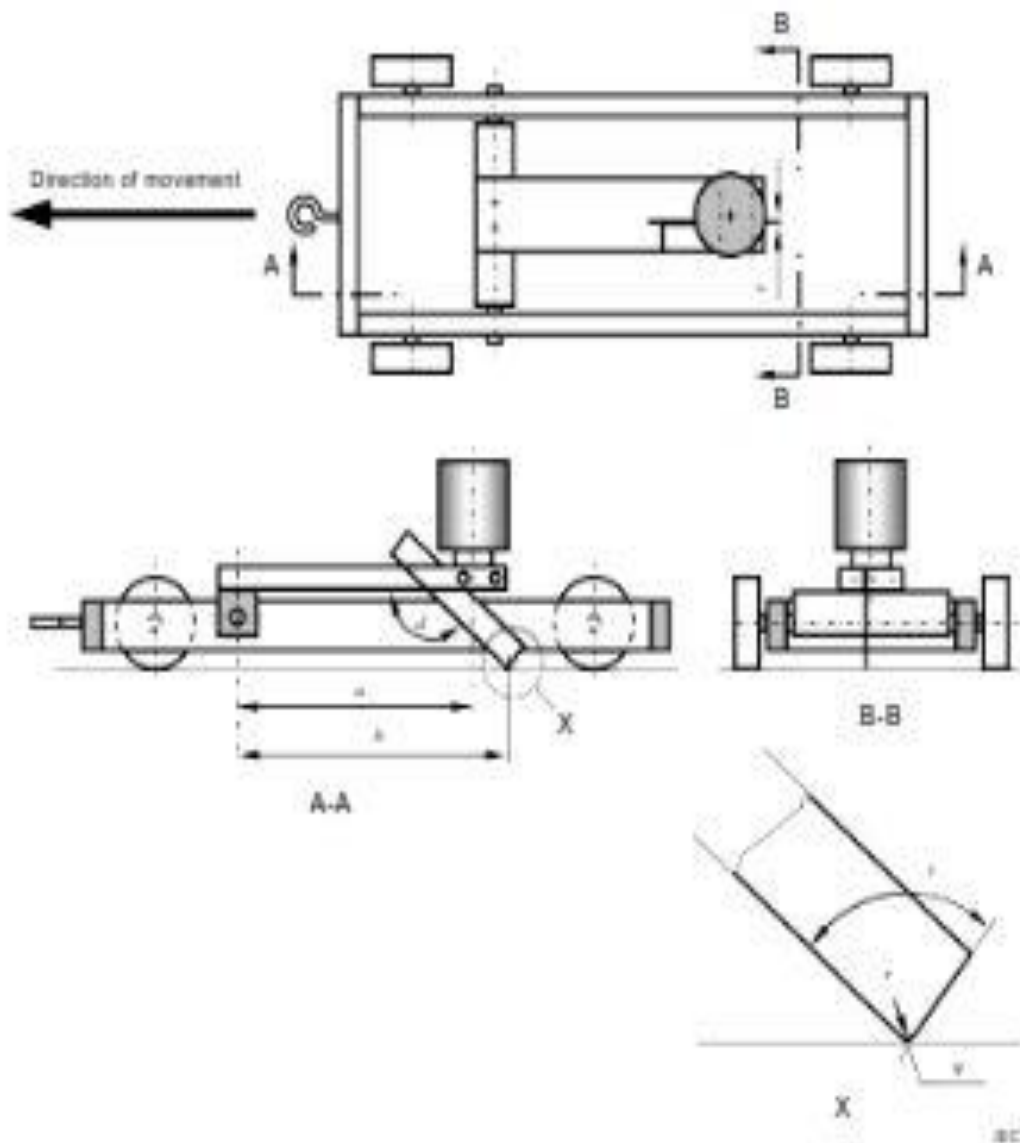
SPECIFICATIONS OF CUT SUSCEPTIBILITY TEST (CST) SYSTEM FOR PV MODULES

Purpose of CST system		To determine whether any front and rear surfaces of the PV module made of polymeric materials are capable of withstanding routine handling during installation and maintenance without exposing personnel to the danger of electric shock
SL No	PARAMETERS	SPECIFICATIONS
1.	Scope of work	I. The CST system should satisfy the overall criteria of technical specifications and procedure to achieve the purpose of the test on PV module as specified according to 10.3 Cut susceptibility test MST 12 of IEC 61730-2 Edition 2.0 2016-08
1.	Test Fixture	I. The CST system shall accommodate with test fixture as shown in Figure 2, designed to draw a defined shaped object, thick carbon steel blade (for example the back of a hacksaw blade) as prescribed acc., to 10.3 MST 12 of IEC 61730-2 EDITION 2.0 2016-08.
2.	speed regulator	I. The CST system should consists of a motor driven text fixture with speed regulator having an adjustable speed range of (150±30) mm/s as desired and according to 10.3 of IEC 61730-2 EDITION 2.0 2016-08 II. The Motor driven test fixture with speed regulator shall allow to turn right or left for 10 degrees in maximum. A built-in stop watch should be supplied either with speed regulator motor driven unit for accurate timing tests.
3.	Blade type and dimensions	I. A test fixture as shown in Figure 3, designed to draw a defined shaped object, over the surface of the PV module with an applied force of 8,9 N ± 0,5 N. The defined shaped object shall be a 0,64 mm ± 0,05 mm thick hardened steel blade sufficiently rigid as not to

		<p>bend sideways during the test. The tip shall have a top angle of $90^{\circ} \pm 2^{\circ}$ and shall be rounded with a radius of $0,115 \text{ mm} \pm 0,025 \text{ mm}$.</p> <p>II. The test fixture shall have a replaceable special cutting chip function</p> <p>III. Additional cutting blades of minimum 20 units (ready to use type) should need to supply along with the CST system.</p>
4.	Applied force	I. The CST system should apply a force of $8,9 \text{ N} \pm 0,5 \text{ N}$ over the surface of the module through an appropriate solid weights as prescribed acc., to 10.3 of IEC 61730-2 EDITION 2.0 2016-08.
5.	Power supply	<p>I. 1/n/p/ 230V $\pm 10\%$, 50 $\pm 1\text{HZ}$. The actual electrical load of the system should be specified.</p> <p>II. Grounding Requirement: Supplier should specify in detail the requirements of the grounding.</p>
6.	Other Requirements	<p>I. Protection types: Electrical/operating panel IP 21 (or any relevant International Standard)</p> <p>II. The CST system shall equipped with rings at both front and rear end; used to connect a rope and control the driving direction.</p> <p>III. A Stopwatch shall provide for accurate timing tests.</p> <p>IV. Equipment should be delivered to the laboratory in semi knock-down condition. Components and sub-assemblies should be sent in separately packed conditions so that these can be easily taken in to the laboratory and thereafter assembled.</p> <p>V. Exterior dimensions of the system along with the space required for operating it should be specified in the offer.</p> <p>VI. For any other required clarifications, the designer may refer to clause no.10.21 of IEC 61730-2 EDITION 2.0 2016-08.</p> <p>VII. On-site acceptance tests should be demonstrated by the supplier using the actual sample modules, as per the standard IEC 61215/61646 AND IEC 61730-2 EDITION 2.0 2016-08. This would also form a part of comprehensive onsite training on operation, maintenance and general servicing of CST System should be provided.</p>



8/C 13/004



Key

- 150 mm from axis to center of weight
- 170 mm from axis to test point
- **Test point:** Carbon steel strip 0,64 mm ± 0,05 mm thick **steel strip**
- 140° angle between horizontal plane and the strips' edge
- Total force exerted at test point 8,9 N ± 0,5 N
- Tip rounded with radius 0,115 mm ± 0,025 mm
- Steel strip top angle 90° ± 2°

Figure 3 – Cut susceptibility test

SPECIFICATIONS OF TERMINAL BOX KNOCK OUT TEST (TBKOT) SYSTEM FOR PV MODULES

Purpose		Removable hole covers in the walls of module terminal enclosures (knockouts) shall remain in place under nominal force application and also be easily removed for the field application of permanent wiring system components.
SL No	PARAMETERS	SPECIFICATIONS
1.	Shaft dimensions	<p>I. The TBKOT system shall be supplied with a minimum dimensions of 38mm length and 6.4mm diameter flat-head circular shaft to apply 44.5N force against knock-off cover for testing purpose as prescribed in 11.3.3 of IEC 61730- 2:2004</p> <p>II. The force should applied in a direction perpendicular to the plane of the knockout and at the point most likely to cause movement.</p>
		<p>III. A necessary arrangement should provide to record and measure the displacement between the knockouts and the box through a digital display</p>
2.	connection box clamp	The TBKOT system shall consists of a connection box clamp as prescribed in 11.3.3 of IEC 61730-2:2004
3.	lift/fall weights	The TBKOT system shall consists of a provision to lift and fall device of either pneumatic/hydraulic based Weights shall be supplied` as prescribed in 11.3.3 of IEC 61730-2:2004
4.	Screw knife	The TBKOT system shall provide with a screw knife (as chisel) to open the knock-off cover
5.	Other Requirements	<p>I. Equipment should be delivered to the laboratory in semi knock-down condition. Components and sub-assemblies should be sent in separately packed conditions so that these can be easily taken in to the laboratory and thereafter assembled.</p> <p>II. Exterior dimensions of the system along with the space required for operating it should be specified in the offer.</p> <p>III. For any other required clarifications, the designer may refer to clause no. 11.3 of IEC 61730-2:2004</p> <p>IV. On-site acceptance tests should be demonstrated by the supplier using the actual sample modules, as per the standard IEC 61215/61646 and IEC 61730-2:2004. This would also form a part of comprehensive onsite training on operation, maintenance and general servicing of TBKOT System should be provided.</p>

TECHNICAL SPECIFICATIONS OF ROBUSTNESS OF TERMINATIONS:

Purpose

To determine that the terminations, the attachment of the terminations, and the attachment of the cables to the body of the module will withstand stresses that are likely to be applied during normal assembly or handling operations. Retention of junction box Test and cord anchorage test are to be performed as given by the test flow in IEC 61215-1.

	Test	Parameters	Technical Description
Robustness of Terminations	Retention of Junction Box	Force applied	40 Newton suitable force without shock, Refer IEC 60068-2-21
		Duration	10 ± 1 sec
		Force gauge	A calibrated force gauge should be supplied In steps of 90°
Test of cord anchorage	Pull Test	Force applied	42 N refer table 1
		Duration	1 sec
		Period measurement	50 times Displacement of the cable
		Torsion test	Torque required
		Duration	1 min
		Maximum angle	45°

Table 1 – Pull forces for cord anchorage test

Cable diameter With insulation if applicable mm	Pull force N	Minimum sheath thickness of test mandrel mm
< 4	30	1 ^a
> 4 to 8	30	1
> 8 to 11	42	2
> 11 to 16	55	2
> 16 to 23	70	2
> 23 to 31	80	2
> 31 to 43	90	2
> 43 to 55	100	2
> 55	115	2

^a For cable diameters up to 4 mm, a suitable non-metallic mandrel may be used.

Table 2 – Values for torsion test

Cable diameter With insulation if applicable mm	Torque Nm	Minimum sheath thickness of test mandrel mm
< 4	0,10	1
> 4 to 8	0,10	1
> 8 to 11	0,15	2
> 11 to 16	0,35	2
> 16 to 23	0,60	2
> 23 to 31	0,80	2
> 31 to 43	0,90	2
> 43 to 55	1,00	2
> 55	1,20	2

Constructional details:

Test Mandrel:

Test mandrels shall consist of a metallic rod with an elastomeric sheath having a hardness of 70 Shore Diameter ± 10 points in accordance with ISO 868 and a sheath thickness as specified in Table 1 or Table 2. The complete test mandrel shall have a tolerance of ± 0.2 mm for mandrels up to and including 16 mm diameter and ± 0.3 mm for mandrels larger than 16 mm diameter.

3. **EARNEST MONEY DEPOSIT (EMD)**

Bidders are required to submit Earnest Money Deposit (EMD) for amount of Rs. 30,000/- (Rupees Thirty Thousand Only) along with their bids in favor of 'National Institute of Solar Energy' payable at Gurugram. The EMD may be submitted in the form of a Demand draft or Bank Guarantee from any of the scheduled banks. EMD is to remain valid for a period of three months from the date of opening the bid. EMD of the unsuccessful bidders will be returned to them at the earliest within 30 days after the award of the contract.

4. **RATES:**

The rates should be quoted specifically on the following lines:

- a. Firm and final cost of the **Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock out Test, Robustness of Termination with complete accessories** as per the above specifications and features along with costs of the installation charges as per the above specifications and features, should be provided.
- b. Taxes and freight etc. if any applicable should be indicated separately and clearly.

5. **DELIVERY PERIOD:** **Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock out Test, and Robustness of Termination with complete accessories** should be delivered in a single consignment at the site/consignee within 6 (six) to 8 (eight) weeks from the date of issue of confirmed supply order.

6. **INSPECTION:** The supplier should satisfy himself/herself that **Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock out Test, Robustness of Termination with complete accessories** at NISE is as per the above specifications and features along with options, accessories, conform to the specifications by carrying out complete pre-inspection of each component before dispatch.

7. **CONSIGNEE:** The Director General, National Institute of Solar Energy, Gurugram – Faridabad Road, Gwal Pahari, Gurugram - 122 003, Haryana, India.

8. **GUARANTEE/WARRANTY:** Measuring instruments supplied should be covered by standard terms of warranty for a period of min 12 months from the date of installation.

9. **PENALTY:**

- i. The supplier shall supply the stores in accordance with the particulars as expressly specified at the time/times and at the place/places only.
- ii. The time for and the date of the stores stipulated shall be deemed to be the essence of the supply/work order.
- iii. If for any reasons the contractor is unable to adhere to the contract delivery dates, he may seek extension in delivery/completion dates well in time by sending a request in writing in this regard to the office issuing the contract/supply order. The purchaser reserves the right to allow the extension of delivery period subject to such conditions as he may think fit. However, the decision of the purchaser shall be final and binding.

10. **DISPUTES:** In case of any dispute the decision of the Director General, National Institute of Solar Energy will be final and binding on both parties. Further dispute, if any will be settled in the Courts of Law at Gurugram, Haryana jurisdiction only.

11. **VALIDITY:** The Tenders should be valid for 90 days from the date of opening.

12. **REJECTION:** Incomplete, conditional, fax, late tenders and tenders without EMD will be rejected summarily. The Director General, National Institute of Solar Energy reserves the right to reject any or all the tenders at his discretion without assigning any reason thereafter.

13. **SUBMISSION OF TENDERS** : Sealed tenders are to be submitted in two parts i.e. **Part-I containing Technical competence/literature along with Demand Draft for EMD, and Part-II containing only commercial invoice in a separate sealed envelope, super scribed as commercial bid.** Both the technical and commercial envelopes should be kept in large size sealed envelope super-scribed **Module Breakage system, Accessibility Test System, Cut Susceptibility System, Terminal Knock out Test, Robustness of Termination** at NISE and positively received by 28/02/2017 and addressed to: The Director General, National Institute of Solar Energy, Gurugram – Faridabad Road, Gwal Pahari, Gurugram - 122 003, Haryana, India.