



**AMTEC**  
**Agricultural Machinery Testing and Evaluation Center**  
**1977**

**ACR 010:2023 CHECKLIST AND REMINDERS FOR THE AMTEC TEST CONDITIONS AND REQUIREMENTS FOR SOLAR-POWERED IRRIGATION SYSTEM**

**■ Application for AMTEC Test**

The test applicant shall submit AMTEC-OP-F01 (Agricultural Machinery Test Application Form) together with the following requirements:

- AMTEC-OP-F16 (Waiver for Machine Specifications)
- AMTEC-OP-F18 (Data Privacy Consent Form)

**■ Technical Specifications of the Machine**

The test applicant shall submit any document/s indicating the specifications and other relevant information of the machine upon application for testing.

- Operator's manual with complete specifications as indicated in Annex B of PNS/BAFS PABES 325:2022
- Brochure
- Machine specifications sheet (shall be filled out upon request and receipt of copy from AMTEC in case the manual or brochure is not available)

**■ Preparation and Operation of the Machine**

The test applicant may designate an official representative to operate, demonstrate, adjust, and witness the actual testing. It shall be the duty of the representative to make all decisions on matters of adjustment and preparation of the system for testing.

The SPIS shall be operated at the recommended setting of the test applicant. The recognized testing authority shall make all measurements, which form part of the test.

**■ Running-in of the Machine**

The SPIS shall undergo a running-in period before starting the test. During the running in period, the various adjustments of the SPIS shall be made according to the recommendation of the test applicant/representative.

**■ Other Necessities**

The following shall also be adequately supplied during the conduct of testing:

- 200-L drum/measuring container
- Basic hand tools

**■ Performance Requirements**

AMTEC shall conduct various tests and verification on different performance parameters of the machine including the following requirements as per PNS/BAFS PABES 324:2022:

**■ Performance Requirements**

Criteria	Requirement as per PNS/BAFS PABES 324:2022	
	Criteria	Performance Data
Maximum PV Performance Ratio	Monocrystalline	18
	Polycrystalline	19
The pump set shall have a test report with pump or performance curve prior to installation.	Provided	
Total volume discharge for whole day operation, m <sup>3</sup> , minimum	As per manufacturer's specification	

**■ Construction and Structural Requirements**

Criteria	Requirement as per PNS/BAFS PABES 324:2022
PV Array	<ul style="list-style-type: none"> <li><input type="checkbox"/> The panels in the PV array should be installed with a rigid alloy rail made of non-corrosive material.</li> <li><input type="checkbox"/> The mounting frame structure should be made from Galvanized Iron (GI) pipes or angular bars that are either primed, hot dipped galvanized with minimum of 5 mils or double coated with non-corrosive paint.</li> </ul>



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	<ul style="list-style-type: none"> <li><input type="checkbox"/> A uniform type and specifications of PV modules, either monocrystalline or polycrystalline, shall be used for the whole array.</li> <li><input type="checkbox"/> The PV modules shall be able to withstand a minimum gustiness and uplift of 180 kph. The standard degradation should be a minimum of 0.5% annually as per IEC 61215-1:2021 (Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1: Test requirements).</li> <li><input type="checkbox"/> The orientation of the PV array shall be as per site assessment. It is recommended that the PV array should be facing the south based on efficiency and performance.</li> <li><input type="checkbox"/> The angle of inclination in degrees for the PV array shall be dependent on latitude of the location maximizing solar energy to be harvested.</li> <li><input type="checkbox"/> Placement of the PV array shall be away from any source of shades any time of the year. If applicable, the site of installation shall be cleared of any trees and other obstructions.</li> <li><input type="checkbox"/> The spatial distance between each PV modules should be at least 20 mm.</li> </ul>
Pumpset	<ul style="list-style-type: none"> <li><input type="checkbox"/> The type, capacity of pump, suction and discharge pipe material, and other basic components shall be dependent on the design of the SPIS.</li> <li><input type="checkbox"/> Dry running, overheating, overloading, voltage transient, and low/high voltage input protection shall be provided for the pumpset.</li> <li><input type="checkbox"/> A trash rack, made of non-corrosive material or painted with protective coating, shall be installed along with the pump intake. The orientation of the pump shall be dependent on the system design (e.g. submersible or surface).</li> <li><input type="checkbox"/> The pumpset to be used shall be dependent on the water source and total head. Casings for groundwater sources shall be provided.</li> <li><input type="checkbox"/> A discharge measuring device, such as flow meter or water meter, should be included with the pumpset.</li> </ul>
Solar Panel Controller	<ul style="list-style-type: none"> <li><input type="checkbox"/> The pumpset controller and the PV array controller shall be insect-proofed and weather-proofed by using double-proof box and sealants.</li> <li><input type="checkbox"/> A minimum of IP58 (splash proof) rating shall be used as per IEC 60529:2019 (Degrees of protection provided by enclosures [IP Code]).</li> <li><input type="checkbox"/> The solar panel controller should be encased with a combiner box.</li> <li><input type="checkbox"/> The capacity of inverter shall be at least 25% higher than pumpset input power requirement.</li> <li><input type="checkbox"/> The controller shall be fully automated based on manufacturers' specifications</li> </ul>
Cables and Wires	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cables and wirings used for the SPIS shall be in accordance with the Philippine Electrical Code (PEC), using PV cables specific for PV modules. Wiring installations shall be properly protected for weather conditions and other external factors.</li> </ul>
Reservoir (optional)	<ul style="list-style-type: none"> <li><input type="checkbox"/> If installed, the design of the reservoir should indicate that the intake be at least equal to the outflow during operation. The reservoir shall be able to withstand the design load. The water storage should also include a ladder, drain and overflow sensor, a freeboard, and an intake and outflow valves. Construction shall be in accordance with the PD 1096 (Adopting a NBCP thereby revising RA No. 6541).</li> </ul>



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<b>■ Safety Requirements</b>	
<b>Criteria</b>	<b>Requirement as per PNS/BAFS PABES 324:2022</b>
General	<input type="checkbox"/> Warning signs shall be installed for electrical components on-site. <input type="checkbox"/> Personal Protective Equipment (PPE) shall be provided for each operator on site. <input type="checkbox"/> A Rapid Shutdown Device (RSD) shall be installed for roof-mounted panels. <input type="checkbox"/> Lightning arrester shall be installed in accordance with Article 2.80 (Surge Arresters) of the National Electrical Code (NEC). <input type="checkbox"/> Surge Protection Devices (SPD) shall be installed along with the PV module.
<b>■ Equipment and Accessories</b>	
<b>Criteria</b>	<b>Requirement as per PNS/BAFS PABES 324:2022</b>
Communication devices on site	Should be provided
Multi-tester on site	Should be provided
<b>■ Operation</b>	
<input type="checkbox"/> Operators shall wear appropriate clothing, along with the provided PPE during operating hours at all times. <input type="checkbox"/> The operators' manual based on the PAES 102:2000 (Agricultural machinery – Operators manual – Content and presentation), maintenance schedule, and a list of warrantable parts of the SPIS shall be provided. <input type="checkbox"/> Readout of voltage and current of running motor, along with other necessary warnings shall be provided on-site.	
<b>■ Suspension and Termination of Test</b>	
<p>In case of any major component breakdown or malfunction that could affect the collection of data and subsequently the test result during the eight-hour observation and test period, a maximum of 30 minutes shall be allowed for troubleshooting. Otherwise, the test shall be suspended.</p> <p>In case the system stops due to sudden change in weather, insufficient discharge or clogging of suction, the test may be suspended with the concurrence of the recognized testing authority and the representative of the test applicant.</p> <p>Should the test applicant request the conduct of the test despite the non-conformity to the test requirements identified by AMTEC, the applicant shall sign the AMTEC Waiver for Nonconformity to Test Requirements.</p> <input type="checkbox"/> AMTEC-OP-F24 (Waiver for Nonconformity to Test Requirements)	
<b>■ Other Assistance During Test</b>	
<ol style="list-style-type: none"> <li>For field and laboratory testing outside the AMTEC premises, the applicant shall shoulder the transportation expenses (i.e. fuel, toll fees, vehicle rental, plane fare, sea fare, etc.) of the AMTEC Staff assigned for the testing activity.</li> <li>The applicant may assist the AMTEC Staff in looking and/or making arrangements for hotel accommodation near the test site.</li> <li>The applicant shall provide drinking water to the AMTEC Staff during the testing activity.</li> <li>The applicant shall provide any form of shed or sunshade (e.g. tent, umbrella, etc.) for the test equipment, samples (if applicable) and AMTEC Staff during the testing activity in the field.</li> <li>The applicant is requested to assist the AMTEC Staff in finding any means to access a safe and convenient restroom near the test site during the testing activity.</li> </ol>	



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■ **Testing Fee**

1. The testing fee for SPIS is PhP 10,000.
2. To proceed through AMTEC test, the test applicant shall settle at least 50 % of the testing fee which is non-refundable but transferrable.
3. In cases of additional testing during the field, the test applicant shall immediately pass the required documents and settle at least 50% of the testing fee within 5 working days after the testing proper.  
 Additional testing, number of machines: \_\_\_\_\_
4. Payment/s shall be directed to the following:  
 Through UPLB Cashier's Office (8AM to 12PM): AMTEC Trust Fund Code No. 8271632-40A2040101000  
 Through Landbank (8:30AM to 3PM): UPLB Trust Fund Account No. 1892100507 or UPLB FI Account No. 1892-1003-29

■ **Other Reminders**

1. All manufacturers, fabricators, assemblers, and importers (MFAI) shall secure a Certificate of Conformity (CC) from the Bureau of Agricultural and Fisheries Engineering (BAFE) which guarantees that their agricultural and fisheries machinery conforms with PNS/BAFS PABES or other relevant standards identified by BAFE. More information about the application for CC can be found at <http://bafe.da.gov.ph/index.php/certificate-of-conformity-of-manufacturers-fabricators-assemblers-distributors-dealers-importers-and-exporters/>.
2. All MFAI shall employ an Agricultural and Biosystems Engineer (ABE), as mandated by RA 10915 (ABE Law), who shall facilitate all activities and concerns pertinent to AMTEC testing and BAFE requirements. Do you currently have an ABE in your roster of employees?  Yes  No