ACR 038:2023 CHECKLIST AND REMINDERS FOR THE AMTEC TEST CONDITIONS AND REQUIREMENTS FOR Agricultural and Fishery Commodity Dryer

■ 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 344:2022
- ☐ 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 agricultural and fishery commodity dryer shall be ready for actual performance testing. The officially designated representative and/or the operator of the test applicant shall operate, demonstrate, adjust, repair, and decide on matters related to the operation of the machine. The operator shall be skilled in operating an agricultural and fishery commodity dryer

■ Running-in of the Machine

A test run shall be conducted prior to the official test to check its condition and make necessary adjustments to the machine. No other adjustments shall be permitted while the official test is on-going.

■ Test Material

- ☐ The material to be used for testing AFC dryer shall be fresh commodity. The amount of material shall be sufficient for one full load of the dryer to be tested.
- ☐ Fruit to be dried shall be single variety and the minimum moisture content shall be 75%. The fruits shall be prepared as necessary before drying:
  - ☐ Tea to be dried shall be newly harvested mature and healthy leaves.
  - ☐ For drying salted fish, *danggit*, and anchovies, the fish shall be fresh, wholesome and fit for human consumption. Salt should be of food grade quality and should meet the purity requirements of standards for iodized salt as per RA No. 8172 (ASIN).
  - ☐ Seaweed to be dried shall be fresh and of one species only. Sea cucumber shall be appropriately processed prior to drying. Each sea cucumber should be at least 300 g in weight.

■ Other Test Necessities

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

- ☐ Fuel sufficient for the entire duration of the test for the burner, prime mover, and generator set, if applicable;
- ☐ Fuel that conforms to the specification supplied by the manufacturer;
- ☐ Stable electric power supply, if applicable;
- ☐ Extra weighing scale with at least 50 kg capacity; and
- ☐ Tools for machine repair and adjustments

■ Machine setting

The agricultural and fishery commodity dryer shall be tested at the manufacturer's recommended setting for the following:

☐ Airflow rate, m^3/min: _____ ☐ Drying air temperature, °C: _____

■ Standard tools

Basic tools shall be provided for the agricultural and fishery commodity dryer. These tools shall be suitable to the necessary adjustment operations during maintenance and operation.

■ Performance and/or Fabrication Test Requirements

AMTEC shall conduct various tests and verification on different performance parameters of the machine including the following requirements as per PNS/BAFS 343:2022:

■ Fabrication Requirements

Criteria	Requirement as per PNS/BAFS 343:2022
Stainless steel bars, metal sheet or plate, heavy-duty mild steel, polycarbonate sheets, greenhouse plastics and locally available materials (i.e., bamboo, wood, etc.)	☐ shall be generally used for the manufacture of the different components of the dryer.
Drying racks/trays/bins	☐ Shall be rigid to be able to support its maximum load capacity and shall be perforated. ☐ There shall be a provision for ease of handling of the drying trays in and out on the walls of the dryer and/or on the tray cart.
Wall and floorings of the drying chamber, if present	☐ shall be rigid to be able to support the maximum load capacity of the dryer ☐ Floorings shall be perforated or meshed.
Parts of the dryer that are in direct contact to the commodity	☐ should be made of corrosion resistant and food grade materials (British Standards Institution [BSI], 2009). ☐ They shall be made of non-toxic materials and designed to withstand the environment of their intended use and the action of food, and, if applicable, cleaning compounds and sanitizing agents.
For dryers that are intended to process commodities for human consumption, parts in direct contact to the commodity	☐ Shall be made of food grade materials such as but not limited to American Iron and Steel Institute (AISI) 304 and AISI 316 stainless steel. ☐ For drying racks/trays/bins that are not made of food grade materials there shall be a provision for perforated food containers that will be in contact with the commodity. ☐ For commodities that are not intended for human consumption, parts of the dryer in direct contact to the commodity shall be made of corrosion-resistant materials.
Control panel	☐ The dryer shall be provided with a control panel with an on/off switch, temperature sensors and display to measure the actual drying air temperature entering and inside the drying chamber, and a manometer to measure the working static pressure in the plenum if a blower/aspirator is present. This provision shall not apply to solar dryers.

Instruments and controls	☐ Instruments and controls used for measuring, regulating, or recording temperatures, relative humidity, or other conditions that affect the final quality of the commodity shall be accurate and adequate in number for their designated use
Solar dryers	☐ Shall be provided with a monitoring panel that consists of temperature sensors and display to measure the actual drying air temperature, and a manometer to measure the working static pressure in the plenum if a blower/aspirator is present. ☐ Should be composed of air type solar energy collector/panel (Teflon-coated), ducting, inlet of drying air, heat collector, burner (for supplemental heating on rainy days) and roof or top plastic cover.
Bolts and screws to be used	☐ Shall be in accordance to PAES 311:2001 (Engineering materials – Bolts and nuts for agricultural machine – Specifications and applications) and PAES 313:2001 (Engineering materials – Screws for agricultural machine – Specifications and applications).
If necessary for tray/cabinet type dryers, tray carts	☐ Shall be rigid to be able to support the drying racks/trays. ☐ Wheels suited for drying operation shall be installed for ease of transporting the drying racks inside and outside the drying chamber ☐ Cabinet type dryers that use forced-air circulation should be air-tight
Heat collector and drying chamber bed	☐ Shall be made of Galvanized Iron (GI) sheet or locally available materials
Roof of greenhouse-type dryer	☐ Shall be made of clear, solid polycarbonate sheet or other similar material used for roofing.
Top plastic cover for flatbed type dryer	☐ shall be a 0.15-0.20 mm thick plastic sheet ☐ This shall be used to cover the heat collector and the drying chamber

■ Performance Requirements

Criteria	Requirement as per PNS/BAFS 343:2022
Drying capacity, kg/h	☐ Shall be based on the specification of the manufacturer
Drying air temperature	☐ The dryer during operation shall have uniform and equally distributed drying air temperature in the drying chamber
Heating System Efficiency, %, minimum	**Heat source** / **Heat introduction** / **HSE, % min** Petroleum-based fuel / Direct / 90 Petroleum-based fuel / Indirect / 75 Biomass / Indirect / 50
Dried commodity quality specification	**PNS No.** / **Title** / **Quality Specification** PNS/BFAD 04:2006 / Ethnic food products – Dried, salted fish – Specification / Water activity, maximum = 0.78 at 25°C PNS/BFAD 16:2007 / Dried tropical fruits / % Moisture content dry basis,

		–Specification	maximum = 15 Water activity, maximum = 0.70 at 25°C
	PNS/BAFPS 68:2008	Dried *danggit*	Water activity, maximum = 0.75 at 25°C
	PNS/BAFPS 85:2010	Dried raw seaweed – Specification	% Moisture content wet basis for Kappaphycus spp., maximum = 40 % Moisture content wet basis for Eucheuma spp., maximum= 35 Color: definitely not black
	PNS/BAFPS 128:2013	Dried sea cucumber	% Moisture content dry basis, maximum = 15
	PNS/BAFS 176:2016	Dried anchovies	Water activity, maximum = 0.70 at 25°C
	PNS/BAFS 29:2017 Part 1	Dried cassava chips and grates for food purposes	% Moisture content wet basis, maximum=13
	PNS/BAFS 29:2017	Dried cassava chips and granules for feed and industrial use	For feed, peeled: % Moisture content wet basis, maximum=13 For feed, unpeeled: % Moisture content wet basis, maximum=13 For industrial use: % Moisture content wet basis, maximum=14

■ **Safety, Workmanship and Finish**	
Criteria	**Requirement as per PNS/BAFS 343:2022**
Fire and dust control	☐ The biomass furnace shall be free from manufacturing defects that may significantly affect its performance ☐ The dryer shall have provision for prevention of pressure build up, and proper/emergency release of combustion gases directed away from the operator
Guards and insulation	☐ Shall be provided for exposed parts with surface temperature exceeding 60°C

All metal parts	☐ Should be machine bend, pressed, and cut and all rough surfaces should be machine finished and smoothed
All moving parts	☐ The dryer shall have adequate protection from or for all moving parts ☐ All rotating parts shall be dynamically balanced
Design, construction, and use of equipment	☐ Shall prevent the contamination of commodity with lubricants, fuel, metal fragments, contaminated water, or any other contaminants
Seams that come in contact with the commodity	☐ Shall be smoothed or maintained so as to minimize accumulation of commodity particles, dirt, and organic matter and thus minimize the opportunity for growth of microorganisms
Corners and Coved	☐ Corners shall be sealed and coved to minimize accumulation of commodity particles, dirt, and organic matter and thus minimize the opportunity for growth of microorganisms
■ Marking	
Safety/precautionary markings	☐ Shall be provided when appropriate ☐ Shall be stated in English and/or Filipino
Durable bond	☐ The markings shall have a durable bond with the base surface material.
Metal aluminum plate	☐ The markings shall be made of metal aluminum plate.

■ Suspension and Termination of Test

If the test material does not conform with the recommended quantity and characteristics, AMTEC shall not proceed with the test. 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.

☐ AMTEC-OP-F24 (Waiver for Nonconformity to Test Requirements)

If the machine stops due to breakdown or malfunction during the test run affecting the machine's performance, the test may be suspended. If the machine cannot continue the operation, the test shall be consequently terminated.

■ Other Assistance During Test

1. For field and laboratory tests 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.
2. The applicant is requested to assist the AMTEC Staff in looking and/or making arrangements for hotel accommodation and food near the test site.
3. The applicant shall provide drinking water to the AMTEC Staff during the testing activity.
4. 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.
5. 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.

■ Testing Fee

1. The testing fee for Agricultural and Fishery Commodity Dryer is _____.
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, 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