

Standards for Thermal Gasifier Systems

S. N.	Details Regarding	Technical Requirements
1	Biomass gasifier reactor and its accessories	<ul style="list-style-type: none"> - Gasifier operation type: Downdraft or Updraft - Hopper with fuel capacity of at least 50% of the batch processing (operation) time in case of batch fuel feeding system or continuous fuel supply system. - Repairable/replaceable hearth, proper ash collection mechanism (either box or screw). - Presence of gas cleaning (filtering) system based on the requirement of the end use application. - Presence of gas flaring port/chimney or access for flaring at the burner. - Gasifier thermal power control mechanism based on the requirement of the end use application. - Assembly with detachable major components for maintenance or replacement during long run. - Rated Gas Flow: as per the requirement of the end use application. - Gasifier feedstock: woody biomass (wood chips, forest residue, corn cobs) or loose biomass. - Gas cleaning assembly based on the level of purified gas requirement in the end use application specifically for the product processing activities where direct flame will be in contact to the processed product.
2	Biomass fuel preparation/processing equipment	<ul style="list-style-type: none"> - Biomass cutting/ sizing tool or equipment set (if the available biomass is not sized based on the gasifier design) - Accessories for Biomass drying provision if necessary
3	General operation and maintenance tools	<ul style="list-style-type: none"> - The tools supplied should fulfill the requirements of general operation and maintenance to be carried by operator.
4	Guarantee/ Warrantee	<ul style="list-style-type: none"> - The complete mechanical system must be warranted against any manufacturing/ design/ installation defects for a minimum period of 2 years - Other electrical components must be warranted against any manufacturing/ design/ installation defects for a minimum period of 1 year
5	Operator training	<ul style="list-style-type: none"> - On the sites training to operator on thermal gasifier system operation and maintenance as per standard practice. - General operation and maintenance manual of the system.

Biomass Thermal Gasifier Test Protocol (Interim)

In the absence of well-structured protocol for biomass gasifier test protocol, an interim test method is suggested to encourage the thermal application of such systems in Nepal.

As per standard norms and mutual agreement between Purchaser and the Supplier, following tests shall be carried out at the field.

- Verification of technical requirements as per the Technical standards for Thermal gasifier systems. The system should fulfill all the requirements as per the technical standard requirements.
- Full load Continuous Run Test of the gasifier unit shall be conducted at the site for a minimum duration of at least six hours with a maximum allowable downtime of 5% (for any and all reasons cumulatively) of the total test duration. For the end use application having one complete cycle duration more than six hours, the minimum continuous operation time shall be greater than the end use application cycle time by 10%. During the continuous operation test, no indication of failure on any of the components shall occur. Similarly, the functionality of the system as per the requirement of the end use application (drying, processing, heating etc.) shall be evaluated based on the manufacturer claim.
- Gas flame temperature shall be $\geq 900^{\circ}\text{C}$ with no smoke visible.