The Pyrolysis Reactor Buyer's Guide

Concept to Commissioning

Most pyrolysis units that '**don't work**' were never set up to succeed.

This guide covers one specific failure point - buying the wrong machine.
Use it to evaluate any supplier before you commit.

This guide focuses on hardware evaluation only. Feedstock viability, permitting, and project economics are covered separately.

The Basics: Defining Your Process

Before looking at hardware, define the job to be done.

Feedstock Profile

Moisture & Size: Limits determine drying/grinding CAPEX.

Chemistry: Chemical composition dictates reactor metallurgy.

Availability: Is your supply chain guaranteed year-round?

Desired Output

Primary Product: Bio-oil, Syngas, or Bio-char?

Spec-Driven: Reactor settings must hit your buyer's specs.

Pre-Testing: Mandatory to confirm yield before buying.

Throughput Strategy

Batch: Flexibility for variable feedstock/shifts.

Continuous: 24/7 efficiency; requires high consistency.

Staffing: Continuous units require dedicated operators.

Site Constraints

Utility Load: Can your grid handle the start-up peak?

Logistics: Footprint for storage, cooling, and truck access.

Permitting: Are there local limits on flares or emissions?

The Trust but Verify Phase

Ensure you aren't paying to do someone else's R&D and real world testing

- **Operational History:** Can they show a unit with **2000+ hours** of runtime?
- **Open Door Policy:** Will they allow a site visit to their factory and an active client?
- **Pilot Testing:** Can you send 50 - 100 kg of your feedstock for a test run before committing? *You'll need to pay for this testing*
- **Witnessed Verification:** Can you observe the test run (in person or remotely) and verify that the test yields match your Desired Output specs?

Engineering & Quality Control

Due diligence on build quality before the unit leaves the factory

Factory Acceptance Test (FAT)

Insist a formal FAT is written into the contract. You need to see the unit run before it leaves their factory floor.

Build Transparency

Do they provide photo, video, and production updates during fabrication? Silence during the build phase is a warning sign.

Regulatory Compliance

Does the reactor, electrical cabinet, and emissions system meet local standards and best practices? Verify this in writing before purchase. If they are new to your region, you might need to work with them to ensure it does.

Material Specifications

What grade of steel is used? Are seals, gaskets, and heat exchanges rated for your specific operating temperature and feedstock chemistry?

The Day 2 Reality: Support & Logistics

A cheap reactor becomes very expensive the moment the support stops after delivery

Support Proximity

Do they have a dedicated support team in your timezone, or are you relying on a shared inbox with a 48-hour response window?

Documentation Quality

Are PLC interfaces, HMI screens, and all manuals accurately translated into your language? Poor documentation and HMI's lead to operator errors and increased risks.

Commissioning Terms

How many days on-site commissioning support are included? What is the daily rate of overruns? Get this in writing.

Spare Parts Availability

Do they keep seals, gaskets, and heaters in stock locally or are they locally available? A failed seal should take a few hours to fix, not weeks waiting for international freight.

Matching the Machine to Your Team

Lower upfront costs often require higher internal technical expertise

The "Self-Reliant" Operator

The Profile: Best suited for companies with existing industrial footprints, 24/7 maintenance crews, and on-site mechanical engineers.

The Strategy: Trading lower upfront CAPEX for higher internal responsibility. You are comfortable managing the "Day 2" reality yourself.

The Requirements:

- **In-House Fabrication:** Ability to repair or modify components like seals, gaskets, or screw feeders locally.
- **Technical Sovereignty:** A team capable of troubleshooting PLC code or HMI errors without waiting for an overseas response.
- **Spare Parts Buffet:** Willingness to invest in an on-site spare parts inventory to mitigate shipping delays.

The Reality: You save on the purchase price, but the project's success rests entirely on your team's ability to keep the "pipes clean" and the reactor spinning

The "Turnkey" Partner

The Profile: Best for new market entrants, waste-to-energy startups, or firms focused purely on throughput and "uptime".

The Strategy: Investing in a "Domestic Support Bridge" to insure against downtime and regulatory friction.

The Benefits:

- **Direct Compliance:** The system is pre-engineered to meet local electrical, pressure vessel, and emission standards.
- **Guaranteed "Proof of Life":** Backed by a formal Factory Acceptance Test (FAT) and performance guarantees tied to your feedstock.
- **Rapid Response:** Access to a dedicated, local support team and a regional warehouse of critical components.

The Reality: You pay a premium upfront to de-risk the commissioning phase and ensure your "Day 2" support is only a phone call away.

The Final Verdict

Don’t go in blind

Buying the wrong hardware is a $500k+ mistake that rarely gets fixed after the unit is on-site.

Most pyrolysis units that "don't work" were never set up to succeed during the procurement phase.

Whether you need a technical audit of a supplier’s spec, commissioning oversight, or a second set of eyes on a mass balance, we are here to help.

Let’s de-risk your project. Visit LYNTRA.COM.AU

About Lyntra

Lyntra partners with clients to accelerate growth in renewable energy, bio-based carbon, and emerging technologies by combining strategic business advisory with expert engineering and project management. We help businesses navigate complexity, aligning market insights, technology selection, and operational execution to deliver scalable, sustainable impact. Our flexible, senior-level support bridges strategy and delivery, empowering clients to capture premium opportunities and lead transformation in evolving markets.

— Travis Mays, Founder & Managing Director, Lyntra

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March 2026