

ILLUSTRATED STEPS / SAVE IT. FIND IT. BUILD IT.

GASOLINE

How plastic becomes fuel: conversion, separation, upgrading and testing.



START HERE

01

GET READY

Tools + clickable build map

02

FOLLOW THE STEPS

One clearly numbered stage at a time

03

FIND IT AGAIN

Quick reference + PDF bookmarks

A research-based explanation of manufacturing plastic-derived fuel, with a real laboratory case. It describes the process, not a buildable household reactor or a validated recipe for your car.

NUKE ON TIKTOK

MORE FREE BUILD GUIDES

SOURCES / Kecsmar: engine study · EPA: plastic conversion

BUILD MAP

NEXT

YOUR BUILD MAP

Tap a step to jump there. The printed page numbers work offline too.

HAVE THESE READY

- Identified, documented plastic feedstock
- Engineered thermal-conversion equipment
- Qualified operators and approved procedures
- Controlled product recovery and gas management
- Fuel laboratory and target specifications
- Instrumented engine test facility
- Batch records and test reports

BEFORE YOU START

Six manufacturing stages, not a household operating procedure. Reported study values do not specify a safe reactor. No car-fuel suitability is established without testing.

KEEP THIS COPY

Save the PDF with its guide ID. Use the build map, bookmarks, or your PDF reader's search to find a step later. Video and source links need internet; the instructions do not.

READ IN ORDER

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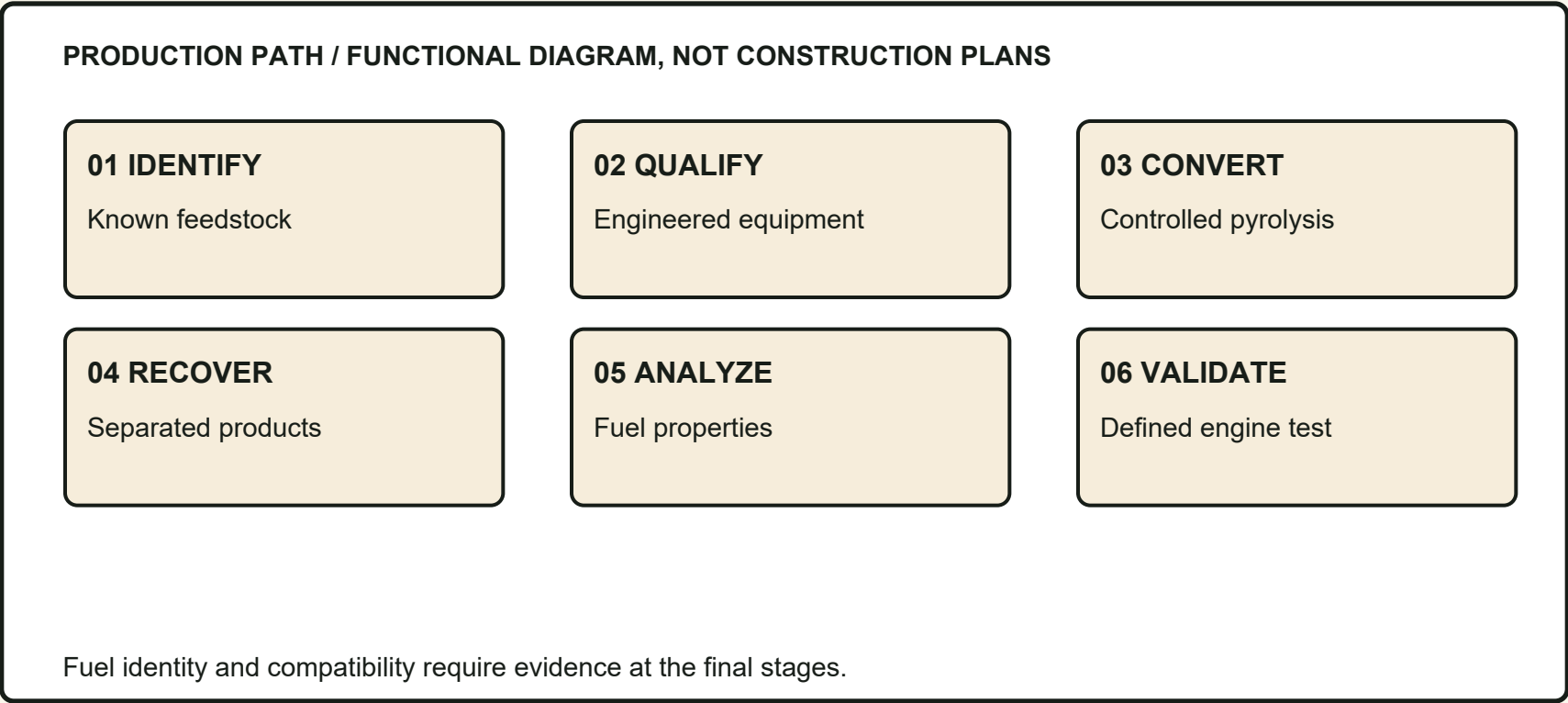
SETUP

What you are actually making

READ BEFORE STEP 01

PREP

Pyrolysis oil is intermediate, not finished gasoline.



- BREAK THE POLYMER CHAINS

 - Heating suitable plastics without oxygen breaks their long molecular chains into smaller products.
 - The output includes condensable oil, gases and solid residue.
 - Different polymers and process conditions change that mixture.
- FINISH THE FUEL

 - Gasoline needs the right composition and properties.
 - Separation, upgrading and blending contribute to that goal.
 - Measurements determine suitability; the first liquid is not automatically gasoline, nor is the last residue diesel.

SOURCES / EPA: plastic conversion · EIA: refining

STEP

Identify and prepare the feed

1 OF 6 / READ IN ORDER

01

Manufacturing starts with known material.



DOCUMENT THE POLYMERS

- **Identify the feedstock and record its composition.**
- Polyethylene, polypropylene and polystyrene have been studied, but they do not produce identical oils.
- Reject unknown material from a defined experimental batch.

SET ACCEPTANCE CRITERIA

- **A qualified process team specifies sorting, contamination screening and preparation for its equipment.**
- A resin symbol alone does not establish purity.
- Avoiding PVC is not a complete feedstock specification; additives, mixed materials and contamination still matter.

SOURCES / EPA: plastic conversion · RSC: plastic fuel study

[BUILD MAP](#)[PREVIOUS](#)[NEXT](#)

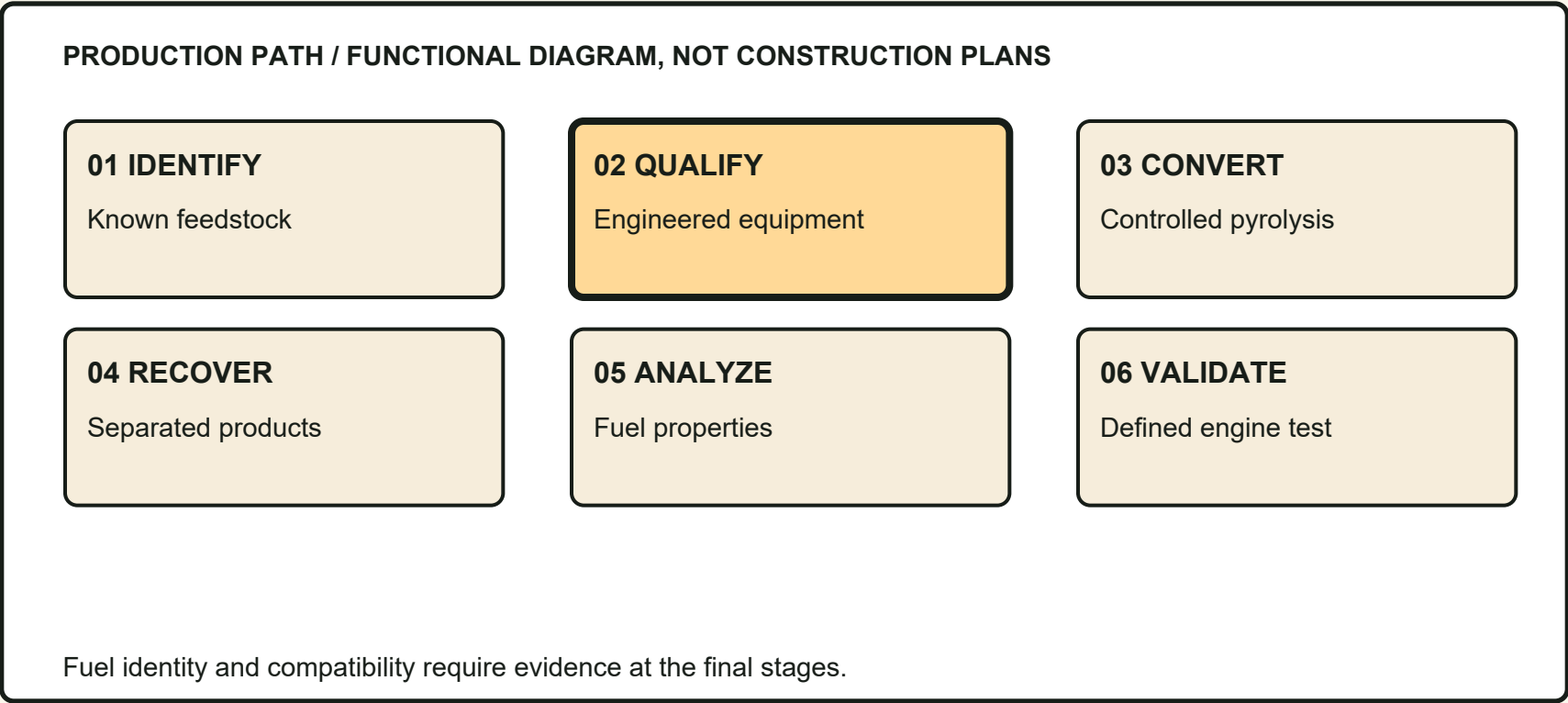
STEP

02

Qualify the process equipment

2 OF 6 / READ IN ORDER

A trained team qualifies engineered equipment.



- KNOW EACH PART'S JOB
- **A heated reactor performs conversion; a reflux section returns heavier material; a condenser recovers liquid; a separate system manages residual gas.**
 - These functions are not supplied by sealing a drum.
- APPROVE READINESS
- **Before operation, the team establishes process hazards, operating limits, controls, shutdown procedures and training.**
 - Equipment-specific engineering must address gas generation, cooling loss and blocked flow.
 - This diagram defines functions, not dimensions or a piping plan.

SOURCES / Kecsmar: engine study · CSB: reactive hazards · HSE: engineered protection

STEP

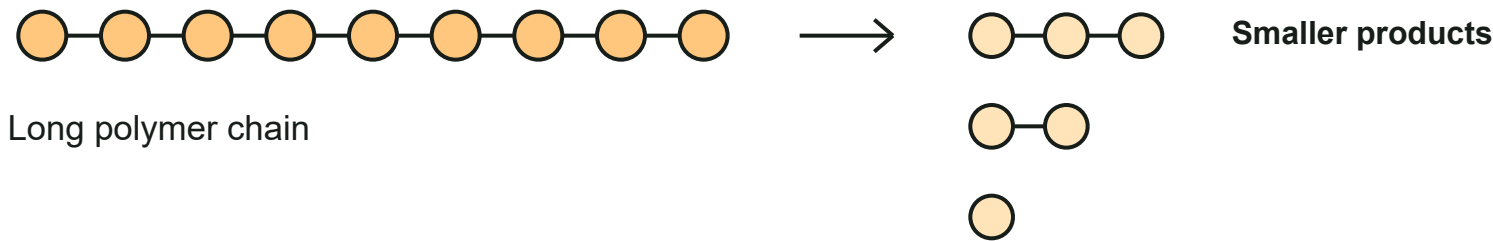
Run controlled thermal conversion

3 OF 6 / READ IN ORDER

03

The operating procedure controls the conversion.

CRACKING / MOLECULAR CONCEPT, NOT A REACTOR PLAN



Oil, gas and residue form a mixture; this sketch does not predict its composition.

MAINTAIN THE DEFINED ENVIRONMENT

- **The qualified operator follows the reactor's approved procedure for its oxygen-excluding environment and controlled heating.**
- Record the batch and operating history.
- There is no universal temperature that makes arbitrary plastic into gasoline.

UNDERSTAND THE CHEMISTRY

- **Thermal cracking breaks chains.**
- A catalyst can change product composition, but catalyst choice and reactor design matter.
- A result from one tested system is not a transferable setting for another vessel.

SOURCES / EPA: plastic conversion · RSC: plastic fuel study · CSB: reactive hazards

BUILD MAP

PREVIOUS

NEXT

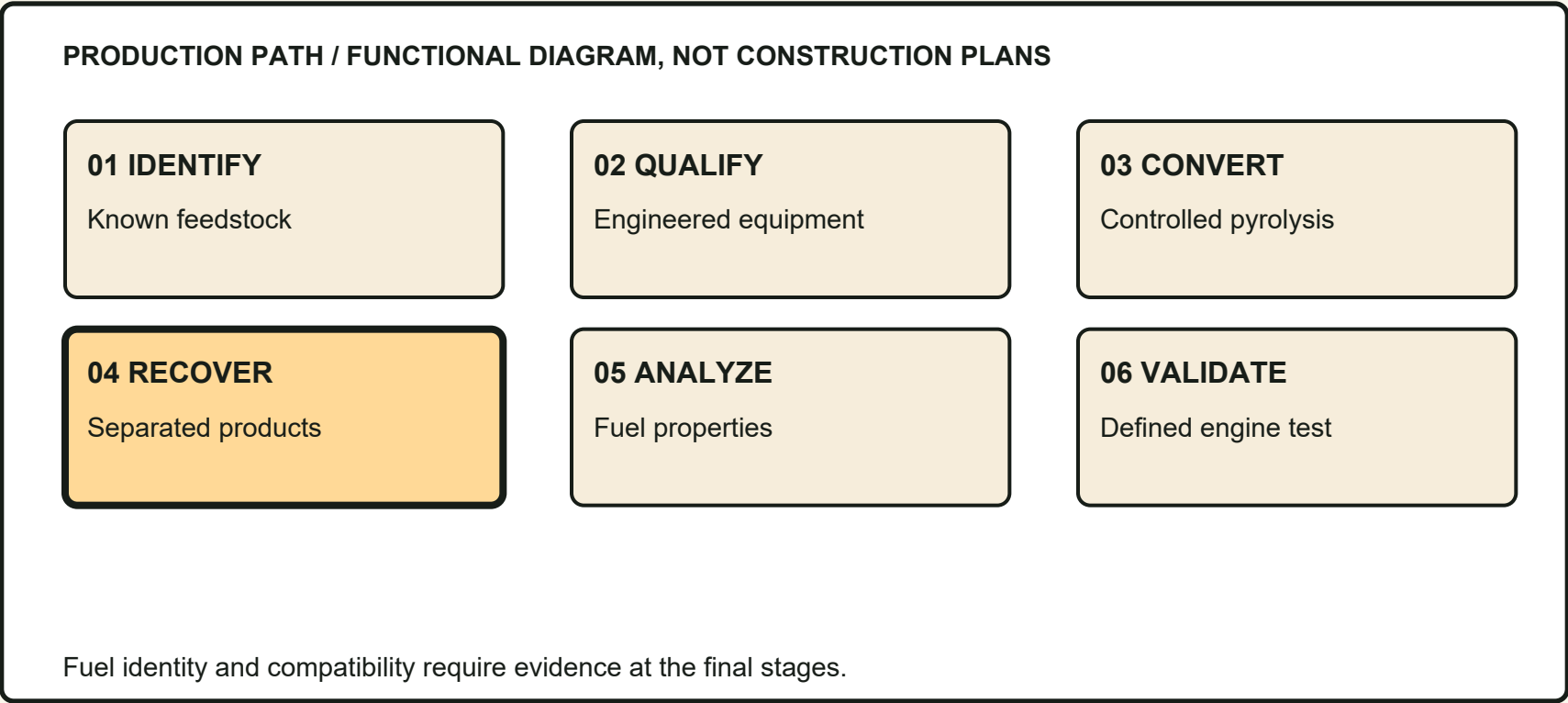
STEP

04

Separate and recover products

4 OF 6 / READ IN ORDER

Track liquid, gas and residue.



CONTROL WHAT IS RECOVERED

- **Reflux returns heavier vapor components for further cracking.**
- Condensation collects part of the remaining vapor as oil; uncondensed gas still requires managed treatment.
- Do not confuse a condenser with complete gas capture.

REFINE THE LIQUID FURTHER

- **Distillation separates boiling-range fractions.**
- Additional conversion or treatment may be needed before blending a target fuel.
- Fraction identity comes from characterization, not drip order.
- Filtering particles twice does not establish composition, octane or volatility.

SOURCES / Kecsmar: engine study · EIA: refining · EIA: octane testing

STEP

Characterize and qualify the fuel

5 OF 6 / READ IN ORDER

05

Keep every sample traceable to its batch.

BATCH RECORD / RESULTS ARE NOT PRE-FILLED

Batch / feedstock identity	
Equipment / procedure ID	
Operating log reference	
Recovered fractions / mass	
Lab report / specification	
Test engine / conditions	
Disposition / reviewer / date	

MEASURE PROPERTIES

- **Researchers have measured density, viscosity, heating value, sulfur and research octane number.**
- Gasoline formulation also depends on volatility.
- A competent laboratory selects the complete specification for the intended product and engine.

RECORD THE DECISION

- **For each test, retain the method, result, applicable limit and pass/fail decision.**
- A short list here is not full certification.
- An off-spec batch requires a defined treatment or rejection decision, followed by appropriate retesting.

SOURCES / UTS: fuel characterization · EIA: refining · EIA: octane testing

STEP

06

Validate on an instrumented engine

6 OF 6 / READ IN ORDER

Qualification still needs application-specific evidence.



- USE A DEFINED TEST PLAN
- **A supervised test compares the candidate with a reference fuel under documented loads and speeds.**
 - Monitor fuel consumption, performance and exhaust; include the intended engine's compatibility and durability questions.
- KEEP THE CONCLUSION NARROW
- **A running engine demonstrates operation under those conditions.**
 - It does not prove long-term reliability, acceptable emissions everywhere or compatibility with every older car.
 - Record exactly what was tested and what remains untested.

SOURCES / UTS: fuel characterization · Kecsmar: engine study

NOTE

A reported laboratory case

KEEP THESE LIMITS WITH THE STEPS

REF

Kecsmar, 2021: reported conditions, not an operating recipe.



PRODUCTION EXAMPLE

- **Reported conditions: 200 g PS/PP/HDPE feed; nitrogen flushing; approximately 520°C reactor endpoint; selected 150°C reflux runs; water-cooled condensation.**

WHAT RAN

- **A carbureted Honda GC-135 drove a 500 W generator load.**
- **It ran, but the resulting oils failed standard transportation-fuel criteria.**

SOURCES / Kecsmar: engine study

NOTE

What this establishes for a car

KEEP THESE LIMITS WITH THE STEPS

REF

Suitability must be demonstrated.



WHAT IS ESTABLISHED

- **Published experiments support the production route and specific engine demonstrations.**
- They do not validate the video's trash-can apparatus, its gasoline/diesel labels or a filter-twice shortcut.

WHAT REMAINS OPEN

- **No particular car is specified here.**
- Its required fuel properties, fuel-system compatibility, emissions and endurance remain unresolved.
- An older carburetor does not settle those questions.
- Keep the batch record, laboratory results and engine report together; do not replace missing tests with a road trial.

SOURCES / Kecsmar: engine study · UTS: fuel characterization · EIA: octane testing

BUILD MAP

PREVIOUS

NEXT

QUICK REFERENCE

Read the full steps first. Tap any row to return to its instructions.

BEFORE STEP 01

Six manufacturing stages, not a household operating procedure. Reported study values do not specify a safe reactor. No car-fuel suitability is established without testing.

01	Define the feed Record polymer identity, composition and acceptance criteria.	P04
02	Qualify the equipment Approve equipment, controls, procedures and trained operators.	P05
03	Control conversion Follow the equipment-specific procedure; retain operating records.	P06
04	Recover and refine Separate product streams and perform the required further processing.	P07
05	Measure and qualify Record laboratory methods, results, limits and decisions.	P08
06	Validate the application Document instrumented tests and all untested conditions.	P09

NUKE SAYS

Prove the product's claim.

SOURCES / Kecsmar: engine study · UTS: fuel characterization · EIA: octane testing