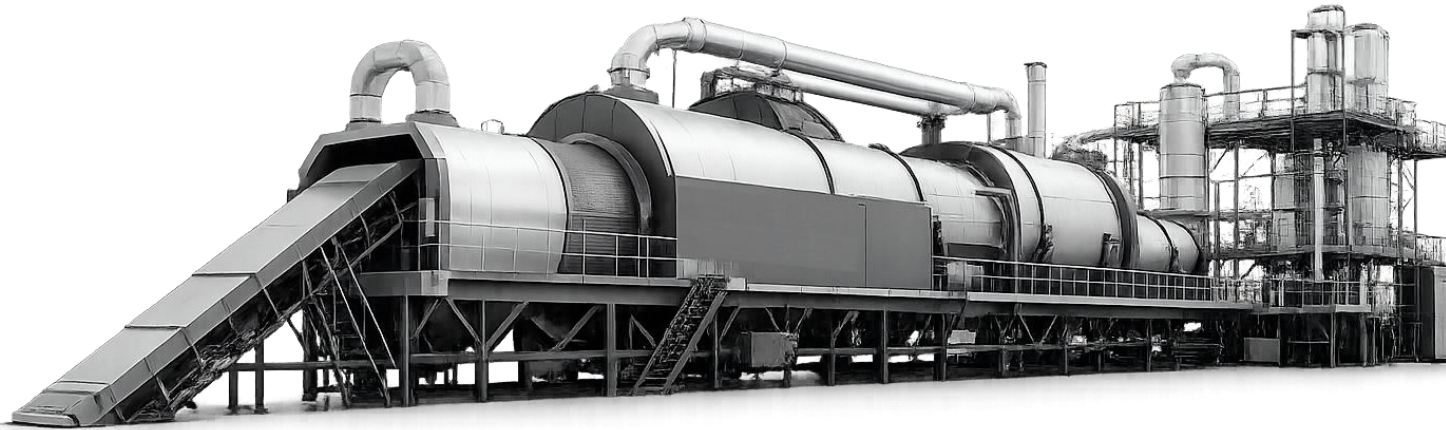




KERONE
Kerone Engineering Solutions Limited

CONTINUOUS TYRE PYROLYSIS



ECO FRIENDLY
CLEAN TECHNOLOGY



CONTINUOUS
OPERATION



HIGH OIL
YIELD



**SAFE &
RELIABLE**

WHAT IS PYROLYSIS?

Thermal decomposition of organic materials at high temperatures in the complete absence of oxygen.

350°C – 500°C

Operating Temperature Range

Process Stages

01

Waste Tyre Feeding

Continuous automatic feed

02

Reactor Heating

Oxygen-free environment

03

Thermal Decomposition

Rubber breaks down

04

Vapor Generation

Oil vapors produced

05

Condensation

Vapors become liquid oil

06

Recovery

Carbon, gas & steel collected

CONTINUOUS TYRE PYROLYSIS

Continuous tyre pyrolysis is an advanced thermal recycling technology that converts waste tyres into valuable products such as Tyre Pyrolysis Oil (TPO), Recovered Carbon Black (rCB), Steel Wire, and Syngas in an oxygen-free environment.

Unlike batch systems, continuous pyrolysis plants operate automatically with uninterrupted feeding and discharge for 24/7 production. These systems offer higher efficiency, lower operating costs, consistent product quality, reduced manpower, and eco-friendly waste tyre management.

Key Features

✓ Internal Rotating Reactor

Special fins ensure uniform heat transfer.

✓ Double Sealing System

Air-tight feed and discharge for safe operation.

✓ PLC-Controlled Automation

One-click startup after preheating.

VALUABLE OUTPUT PRODUCTS

Every tonne of waste tyres generates four valuable by-products

40%

YIELD

Tyre Pyrolysis Oil

Industrial furnace fuel, boiler fuel,
alternative energy

33%

YIELD

Carbon Black

Rubber, pigment & construction
material industries

13%

YIELD

Steel Wire

Recyclable steel scrap for
manufacturing

10%

YIELD

Syngas

Reused as internal heating fuel to cut
energy costs

CONTINUOUS vs BATCH PYROLYSIS

	✦ CONTINUOUS	BATCH
Operation	✓ 24/7 uninterrupted	Limited cycle
Feeding	✓ Fully automatic	Manual operation
Production	✓ High efficiency	Lower capacity
Labor	✓ Minimal crew needed	High manpower
Quality	✓ Consistent output	Product variation
Downtime	✓ Minimal – optimized	Frequent shutdowns
Energy	✓ Optimized, syngas reuse	Higher consumption

PROCESS FLOW



BY-PRODUCTS ALSO RECOVERED

Tyre
Pyrolysis Oil

Carbon Black
Collection

Steel Wire
Recovery

Syngas
Recycling



TYRE PYROLYSIS OIL

40%

Average Yield

(35–45% by weight)

What is Tyre Pyrolysis Oil?

Tyre Pyrolysis Oil (TPO) is a dark, viscous fuel oil produced when rubber vapors condense during the pyrolysis process. It is chemically similar to light fuel oil and diesel, making it a versatile industrial energy source.

Flash Point

~35 – 65°C

Calorific Value

~9,000 kcal/kg

Viscosity

Moderate – similar to diesel

Sulphur Content

0.5 – 1.5%

INDUSTRIAL APPLICATIONS

Industrial Furnaces

Marine Boilers

Power Generation

Cement Kilns

Steel Mills

Ship Engines



RECOVERED CARBON BLACK

33%

Average Yield

(30–35% by weight)

What is Recovered Carbon Black?

Recovered Carbon Black (rCB) is a fine black powder collected from the pyrolysis reactor. It retains many properties of virgin carbon black and can be directly used or further refined for industrial applications.

Particle Size	20 – 200 nm
Carbon Content	80 – 90%
Surface Area	40 – 80 m ² /g
Grade	N330 / N550 equivalent

INDUSTRIAL APPLICATIONS

Rubber Products

Tyre Manufacturing

Ink & Pigments

Plastic Filler

Construction

Paint Industry



STEEL WIRE SCRAP

13%

Average Yield

(10–15% by weight)

What is Recovered Steel Wire?

Steel wire is the reinforcing material embedded in tyres. During pyrolysis, as rubber decomposes, the steel belt is freed and continuously discharged as clean metallic scrap ready for recycling.

Steel Grade

High tensile steel

Purity

~95% clean metal

Form

Wire bundles / coils

Market Value

₹25,000 – ₹35,000 / MT

INDUSTRIAL APPLICATIONS

Steel Smelting

Rebar Production

Wire Drawing

Metal Casting

Construction

Fabrication



PYROLYSIS SYNGAS

10%

Average Yield



SELF-FUELLING

Process Fuel – Zero Extra Cost

What is Pyrolysis Syngas?

Syngas (synthetic gas) is the non-condensable gas fraction produced during pyrolysis. Composed mainly of hydrogen, methane, and other light hydrocarbons, it has a high calorific value and is fed back into the reactor as fuel — making the process nearly self-sustaining.

Main Components

H₂, CH₄, CO, CO₂, C₂H₄

Calorific Value

~3,500 – 5,000 kcal/m³

Temperature

Generated at 400–500°C

Usage

100% recycled as process heat

ENERGY BENEFITS

Reactor Heating

Reduce Fuel Costs

Power Generation

Hot Air Systems

Steam Boilers

On-site Energy

KEY FEATURES

Engineered for maximum output,
minimum downtime, and operator safety.

10 – 30 TPD Capacity

◆ 24/7 Continuous

Uninterrupted automated operation

◆ PLC/SCADA

Full automation & remote monitoring

◆ High Oil Recovery

35–45% oil yield from waste tyres

◆ Low Fuel Usage

Syngas reused as process fuel

◆ Eco-Friendly

Controlled emission management

◆ Advanced Safety

Emergency shutdown & gas detection

TECHNICAL SPECIFICATIONS

PLANT TYPE	Continuous Pyrolysis	CAPACITY	10 – 30 TPD
FEED MATERIAL	Waste Tyres	TEMPERATURE	350°C – 500°C
HEATING	Oil / Gas / Syngas	REACTOR	Rotary Continuous
OPERATION	Fully Automatic	OIL YIELD	35 – 45%
CARBON BLACK	30 – 35%	STEEL RECOVERY	10 – 15%
POWER	60 – 200 kW	CONTROL	PLC / SCADA

ENVIRONMENTAL & ECONOMIC BENEFITS



ENVIRONMENTAL

- ◆ Reduces tyre landfill waste
- ◆ Prevents open burning pollution
- ◆ Converts waste into clean energy
- ◆ Supports circular economy
- ◆ Reduces fossil fuel dependency
- ◆ Lower greenhouse gas emissions



ECONOMIC

- ◆ High return on investment (ROI)
- ◆ Revenue from 4 by-products
- ◆ Reduced fuel consumption
- ◆ Low operational expenses
- ◆ Profitable recycling business
- ◆ Growing alternative fuel market

SAFETY & AUTOMATION



Emergency Shutdown

Instant auto-stop on abnormal conditions



Temp & Pressure Mon.

Real-time continuous sensor monitoring



Gas Leak Protection

Automatic gas detection and alert system



Fire Prevention

Fire suppression and prevention systems



PLC Automation

Fully automated operation with PLC control



Real-Time Monitoring

Live process dashboards and alerts



Auto Feed & Discharge

No manual intervention required



Data Logging

Process history and performance tracking

INDUSTRIAL APPLICATIONS

8 key sectors benefit from continuous
pyrolysis technology.



Waste Recycling

Tyre waste management



Fuel Industry

Alternative furnace fuel



Cement Industry

Fuel replacement



Power Plants

Energy generation



Chemical Industry

Raw material recovery



Steel Industry

Steel recycling



Rubber Industry

Carbon black reuse



Environmental

Sustainable waste disposal

CONCLUSION

The Future of Waste Tyre Recycling

Continuous tyre pyrolysis converts discarded tyres into valuable products, reducing environmental pollution while generating strong economic returns.

✦ Continuous 24/7 operation

✦ Efficient energy recovery

✦ Eco-friendly waste management

✦ High industrial profitability



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THANK YOU

Questions & Discussion

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