

# FULLY MECHANIZED RICE AND WHEAT PRODUCTION WITH A FOCUS ON LOSS REDUCTION



## PART.06



# Mechanization of Grain Drying



# Low-Temperature Circulating Grain Dryer

## Equipment Composition

- Heating unit, automatic grain temperature control system, main drying chamber.

## Scope of Application

- Drying grains such as paddy rice, wheat, maize, and soybeans.

## Core Features

- Low-temperature, high-airflow, and thin-layer circulation.

## Advantages

- Precise **temperature control** (usually below 50°C) and **evenly distributing airflow** prevent grain overheating and damage.
- Ensure the **quality** and **germination rate** of dried grains.
- Particularly suitable for drying **high-moisture grain** or **seeds**.
- **High efficiency** and **environmental benefits**.





# Box-Type Ventilation Dryer

## Equipment Parameters

- **Ventilation Method:** Axial-flow fan ventilation with an airflow speed of 0.5 m/s.
- **Grain Layer Thickness:** 30 - 45 cm.
- **Batch Processing Capacity:** 500 - 1,500 kg.
- **Drying Time:** 12 - 18 hours.

## Advantages

- Simple structure and low cost.
- Versatility in drying agricultural by-products.
- Suitable for smallholder farmers.

## Limitations

- Uneven drying, with a **moisture difference** of **4 - 5%** between the **top and bottom layers**.
- **Manual turning** or **intermittent unloading** is required to improve uniformity.

## Suitable Scenarios

- Small-scale or emergency drying situations.



# Vertical Bin Ventilation Dryer

## Equipment Composition and Function

- **Equipment Composition:** Storage bin, ventilation panels, fan system.
- **Functional Features:** Combines thick layer drying with storage functions.

## Core Advantages

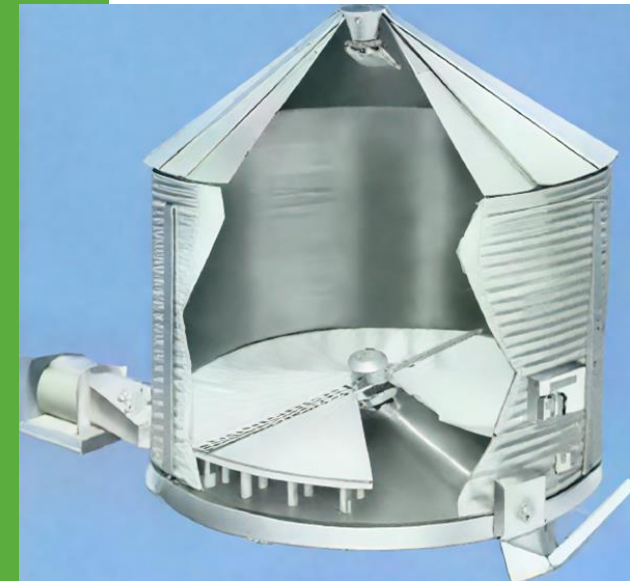
- Simple structure, large capacity, and low energy consumption.
- Uniform ventilation and effective moisture removal, ensuring good quality of the dried grain.
- Suitable for large-scale operations.

## Limitations

- Uneven drying and slower speed.
- High power consumption and susceptibility to weather conditions.

## Improvement Measures

- Optimize the drying effect through grain turning or staged operation.



# Internal Circulation Mobile Dryer

## Innovative Design

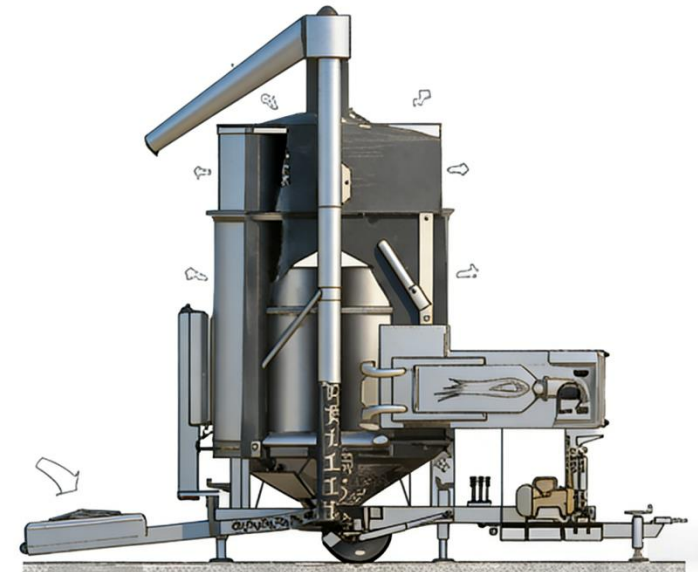
- Shortens the drying section + enables high-speed grain circulation → replaces slow-drying towers + reduces machine height.
- Eliminates the bucket elevator → compact, lightweight design + smaller footprint at the same productivity.

## Core Advantages

- Efficient and uniform drying.
- High mobility, allowing for towing.
- Fast unloading and convenient feeding.

## Suitable Scenarios

- Suitable for flexible farm operations.
- Widely used in rural areas of Europe and North America as a modern, user-friendly grain drying solution.



# Mobile Rotary Grain Dryer

## Drying Principle

- Uses hot air as the medium.
- Adopts a recirculating drying process → ensures uniform moisture reduction + drying quality.

## Scope of Application

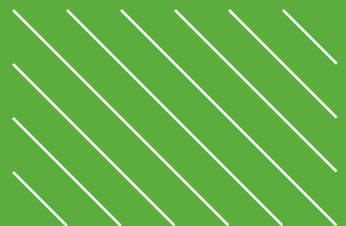
- **Grain Types:** High-moisture rice, wheat, maize, etc.
- **Target Users:** Farms, grain depots, and professional users.

## Advantages and Features

- **Flexible Fuel Options:** Supports coal, wood, straw; produces **clean, pollution-free hot air**.
- Smart Monitoring: **Automated temperature & humidity monitoring** ensures drying quality.
- Economical & Portable: **Compact structure, easy mobility**, and **low investment and low operating costs** for small/medium farms.

## Equipment Positioning

- An efficient, economical, and environmentally friendly grain drying solution.



# Energy-Saving and Eco-friendly Grain Drying Methods



## ■ Straw Fuel Briquettes

Agricultural waste recycled into renewable energy.



## ■ Underground Cage Drying

Utilizes subsurface ventilation for natural dehumidification.



## ■ Functional Drying Silos

Integrates ventilation, temperature, and humidity control.



## ■ Above-Ground Aeration Systems

Circulates surface airflow for enhanced ventilation.



# Future Directions for Mechanized Drying for Rice and Wheat

The mechanization of rice and wheat drying focuses on five key areas

1. **Improved Adaptability:** Optimize processes for varying moisture levels and crop varieties.
2. **Efficiency-Cost Balance:** Adopt multi-fuel options and reduce energy consumption.
3. **Environmental performance:** Cut emissions and promote clean energy use.
4. **Advanced Automation:** Integrate intelligent temperature and humidity control systems.
5. **Centralized drying centers:** Integrating temporary storage, drying, and warehousing into effective hubs.

## Vision

- Drive **technology integration** and **large-scale application** to establish an **efficient, green, and sustainable post-harvest grain processing system**.