

# PRODUCTION OF FOUNDRY MATERIALS FOR AGRICULTURAL MACHINERY

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## Abstract

This article discusses the manufacture of agricultural machinery parts by casting. Agricultural machinery casting parts are the most important component of modern agricultural equipment. That different types of castings depend on different application requirements. Each type serves a unique purpose and is vital for the efficient operation of agricultural machinery.

**Keywords:** agricultural machinery, casting materials, sand molds, modeling, sand, carbon steel, stainless steel, manganese steel, gray cast iron, ductile iron.

## Introduction

One of the main methods of manufacturing parts of agricultural machinery is sand casting.

Sand casting is one of the main production methods for various agricultural castings. A typical sand-casting process involves creating parts and placing the molten metal in a sand mold. The process then allows the mold to cool and solidify. Finally, it shows the hardened part, removing the sand from the mold.



Rice. 1.

Rice. 1. Casting mold is a device for obtaining castings.



Fig. 2.

Rice. 2. The detail is sand casting for the machine.

The process of making a casting mold is called molding. A casting mold includes a system of elements that form a working cavity, in which, after pouring the melt and solidifying it, a casting is formed.



The sand casting method is widely popular in the production of agricultural parts. This method makes it possible to produce large and complex parts of various geometries. As a result, sand casting is the best method for casting agricultural machinery parts.

However, the sand casting method can be difficult to achieve smooth and accurate tolerances. In addition, the sand used in the mold wears out quickly. As a result, you may have to constantly replenish your inventory, resulting in additional costs and losses.

Despite these limitations, sand casting techniques remain popular.

Agricultural machinery and equipment require different types of parts from different materials. Each of these materials has unique properties and advantages. Some are good for durability, and some are good for wear resistance and corrosion resistance.

Popular materials are carbon steel, stainless steel, manganese steel, gray cast iron, and ductile iron. These materials are widely used in the production of agricultural machinery parts.

### **Carbon Steel:**

This material is highly durable, durable, and versatile. As a result, carbon steel is prevalent in agricultural parts. Common carbon steel parts include plowshares, cultivator tips, and tillage equipment. In addition, combine harvester components, seed drills and harvesting equipment are noteworthy. Carbon steels are a cost-effective solution compared to other materials.



Rice. 3. Sand casting parts for the machine.

**Stainless Steel:** When your application requires high corrosion resistance, stainless steel is the best option. This material is known for its excellent corrosion resistance. In addition, it is a durable and reliable material, ideal for casting agricultural machinery.

**Manganese steel:** This casting material is also famous for its high strength and toughness. Shares, cultivator blades, tillage equipment, and wear liners are usually made of manganese steel.

**Grey cast iron:** Widely distributed in many areas. These include ploughshares, cultivators, disc knives and tillage equipment. Transmissions, gearbox housings, cylinder blocks and pumps are typical parts of grey cast iron agricultural machinery.

However, gray cast iron is brittle and prone to cracking or shattering when suddenly struck or stressed.



**Ductile iron: This casting material is also known as nodular cast iron. Ductile iron is also popular for making agricultural machinery parts due to its excellent properties.**

Ductile Iron: Widely used in the casting of many agricultural machines. Special applications include gearboxes, hydraulic pumps, valve components, cylinder blocks, and cylinders.

Agricultural machinery casting is the most important component of modern agricultural equipment. We have already mentioned that different types of casting depend on different application requirements. Each type serves a unique purpose and is vital to the efficient operation of agricultural machinery. Below are some common types of agricultural machinery casting:

- 1. Turnbuckles:** Provide tension to cables or ropes. Ductile iron or steel are typical materials for these agricultural machinery parts.
- 2.Studs:** A type of fastener used to fasten various components of machines. Their typical materials are ductile iron, steel, and aluminum.
- 3. The pins of the rotary cultivator** usually prevail in soil preparation. Their typical materials are steel or ductile iron.
- 4. Implements parts and equipment** common when attaching agricultural implements to various machines. Typical materials for them are ductile iron or steel.
- 5. Agricultural manifolds** are commonly used in engines to distribute fuel and air. Their typical materials are cast iron, ductile iron, and aluminum.
- 6. Enclosures:** Agricultural machinery enclosures protect the components of the device. Typical materials for them are ductile iron or steel.
- 7. Valve parts** regulate the flow of liquids and gases. Typical materials for them are ductile iron or stainless steel.
- 8. Agricultural Brackets Auxiliary Equipment Components** These brackets are made of ductile iron, steel, or aluminum.
- 9. Covers** protect the components of agricultural machinery from dirt, dust and other environmental factors. As a rule, they are made of ductile iron or steel.
- 10. Axle support** is a critical component of agricultural vehicles for proper functioning.
- 11. Tractor gearbox:** Agricultural vehicles such as tractors use gearboxes. It transmits power from the engine to the wheels.
- 12. Pulleys:** Belt pulleys transmit power from one component to another. Typical materials for them are ductile iron or aluminum.

### References

1. S.A. Rasulov., Design and Production of Casting Products, Tashkent 2017.
2. Peter Beeley, Foundry technology., London, 2003.
3. Sh.N.Saidhodjayeva., Technology of Craftsmanship, Sh.N.Saidhodjayeva., Tashkent, 2020
4. A. I. Valter, A. A. Protopopova "Fundamentals of Foundry" — 2019 333 p.
5. "Cast parts. Textbook for Secondary Vocational Education" – 2021, 182 pages.
6. O.V. Ivochkina, L.G. Znamensky "Theoretical Foundations of Sand Casting" – 2023, 157 p. Infra-Engineering.

