دانشکده فنی و حرفه ای انقلاب اسلامی
زبان تخصصی ریخته گری

حمزه نخعی نیا
زمستان ۹۹

References and useful websites:

- Casting (John Campbell)
- Design for Manufacturing(chapter 6)
- English for Materials Science and Engineering
- www.afsinc.org
- www.amc.aticorp.org
- www.asm-intl.org

محتوای هر جلسه

- تدریس ۲۰ کلمه کاربردی مختص ریخته گری
- بررسی و تحلیل متون و مقالات مربوطه
- تدریس گرامرهای مورد نیاز

نحوه ارزیابی

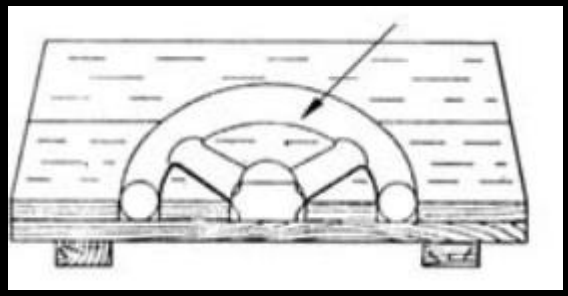
- کوییز هر جلسه (۵ نمره)
- ارائه سمینار به صورت فردی(۵ نمره)
- امتحان پایانی(۱۰ نمره)

محتوای درس

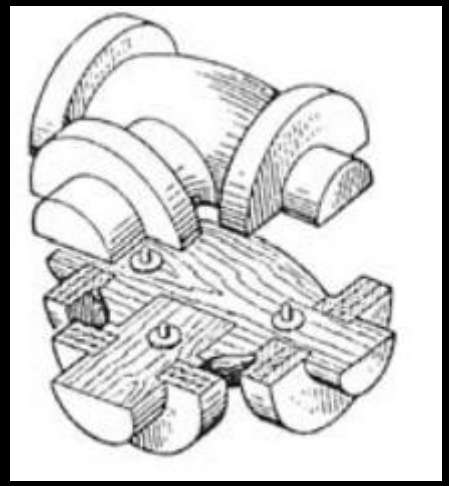
- انواع مدل ها، عیوب ریخته گری، و یادگیری کلمات مربوط به ریخته گری
- ریخته گری و انجماد
- بررسی انواع روش های ریخته گری
- طراحی سیستمهای ریخته گری

Patterns:

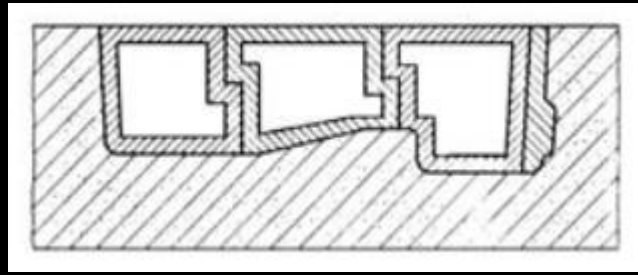
solid pattern, unsplit pattern, single piece pattern, one-piece pattern



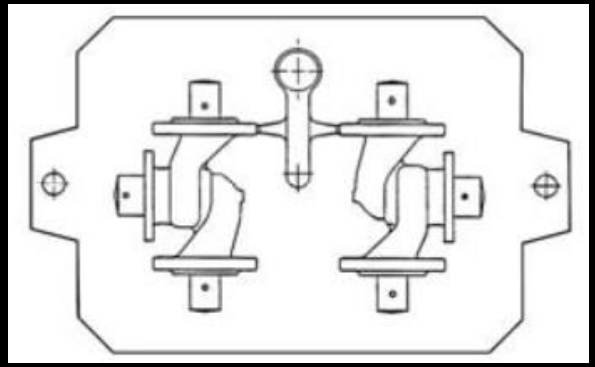
cope and drag pattern, two-piece pattern



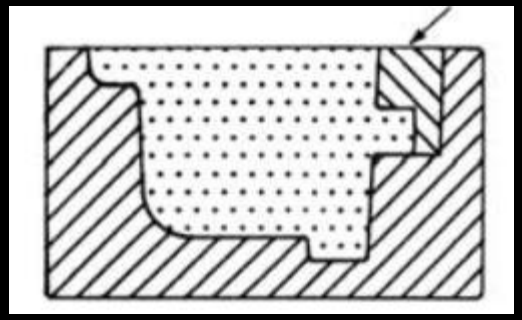
- split pattern, parted pattern, divided pattern
- built-up pattern, multiple-piece pattern, multiple-part pattern



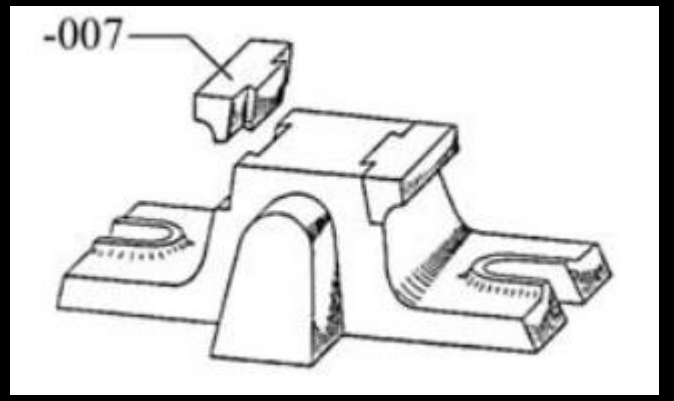
- mounted pattern



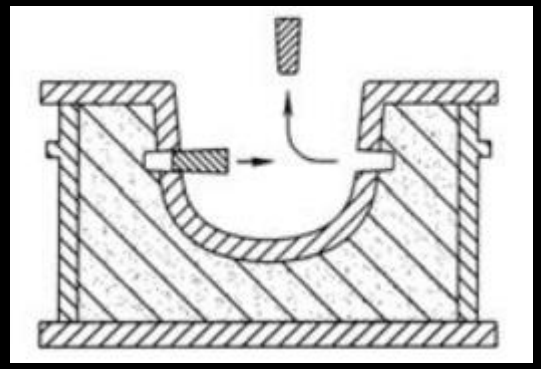
- loose pattern, unmounted pattern
- loose piece, loose part



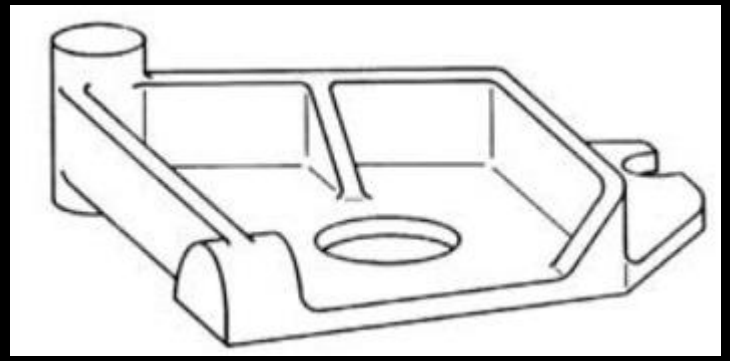
- loose-piece pattern



- **Drawback**

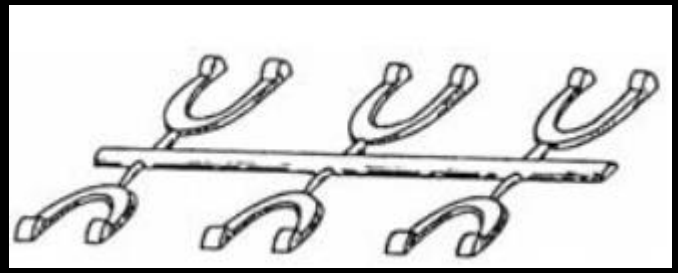


- **natural pattern**

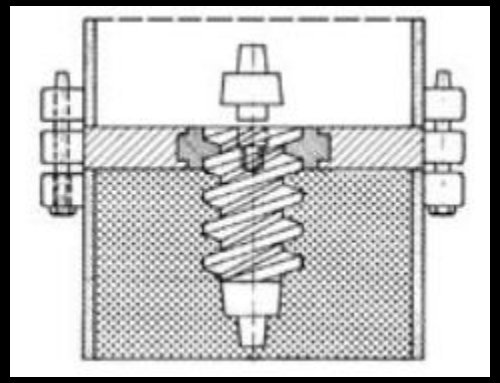


- Double contraction pattern, master pattern
- single contraction pattern, production pattern, working pattern

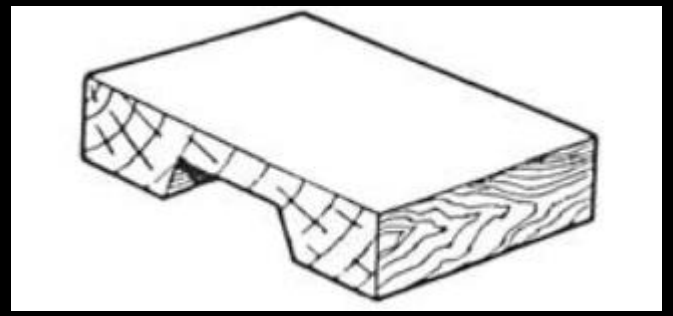
- **standard pattern**
- **temporary pattern**
- **simplified pattern**
- **gating pattern**
- **gated pattern**



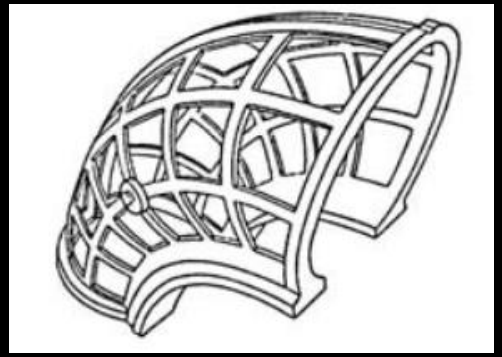
- screw pattern



- flat(-back)pattern



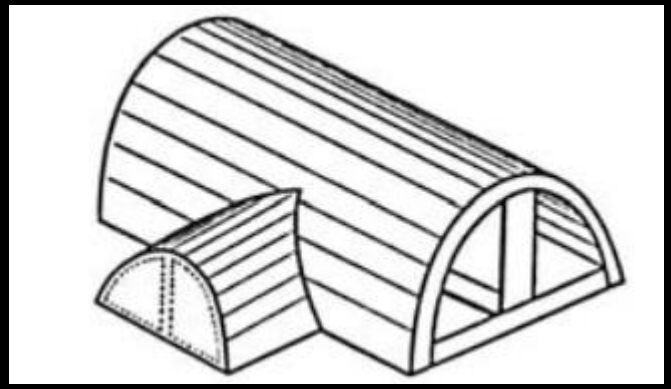
- skeleton pattern



جلسه دوم

Pattern

- **faked pattern**
- **slatted pattern**



- heat disposable pattern, fusible pattern

Alloys

- Brass
- **standard brass**
- cast brass
- Yellow brass
- **alpha brass**
- **aluminium brass**
- **silicon brass**
- **naval brass, navy brass**
- **leaded brass**
- **nickel brass**

Alloys

- **tungsten brass, wolfram brass**
- **high-tensile brass**
- **german silver, nickel silver**
- **Monel (metal)**
- **gilding metal**
- **red brass, red metal**
- **light (metal) alloy**
- **silumin**
- **modified silumin**

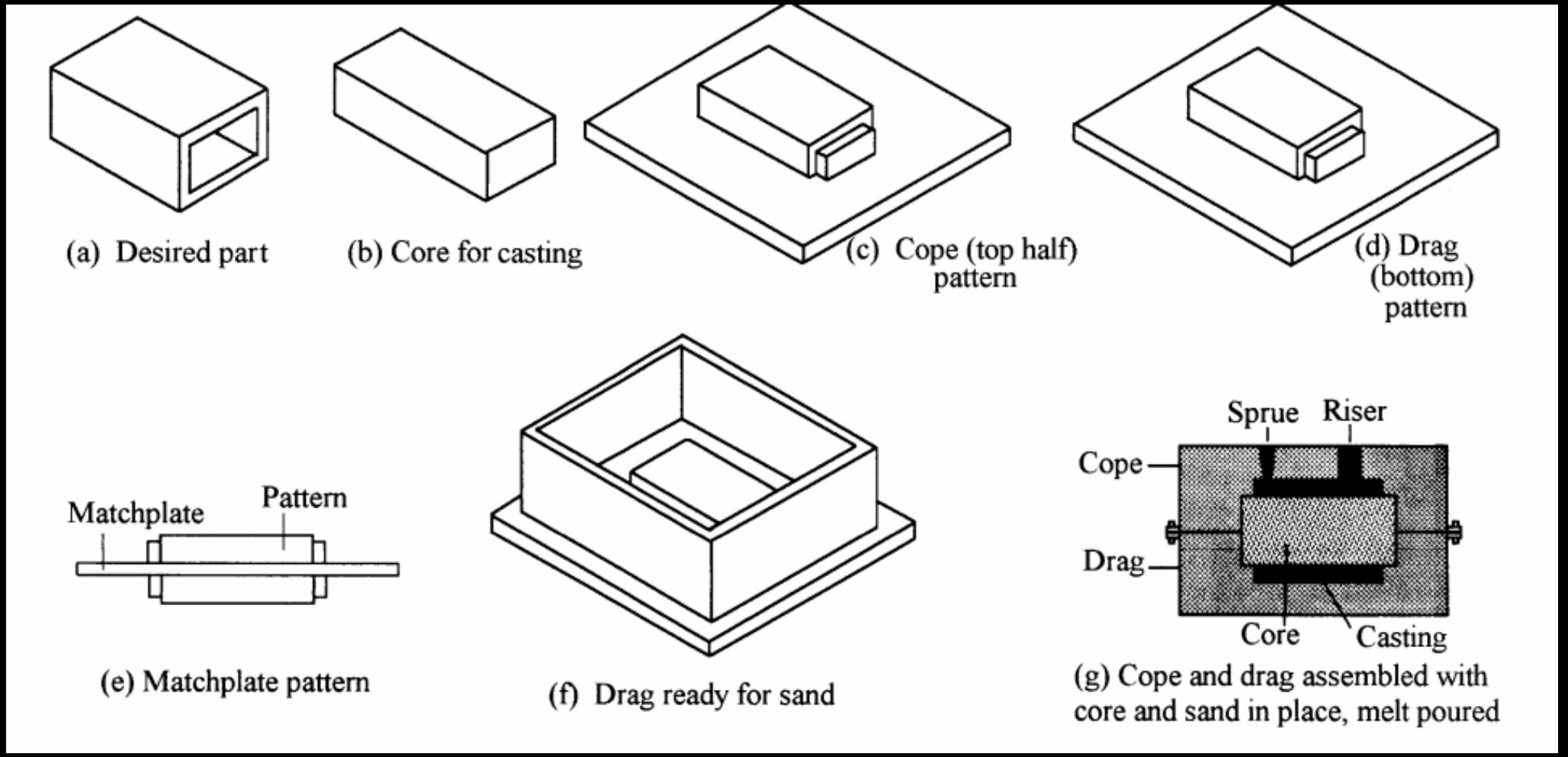
SAND CASTING

- Sand casting is a process in which a sand mold is formed by packing a mixture of sand, a clay binder, and water around a wood or metal pattern that has the same external shape as the part to be cast. A pattern can come in two halves: a top half (called a cope) and a bottom half (called a drag)

SAND CASTING

- Each half is placed in a molding box, and the sand mixture is then poured all around the pattern. After the sand is packed, holes, which are used to pour the molten metal into the mold (sprue) and to be used as a reservoir of molten metal (risers), are formed in the sand. Vents are also created in order to allow the escape of gases from the melt.

SAND CASTING



جلسه سوم و چهارم

SAND CASTING

- Then the pattern is removed and a runner system or small passageway is created inside the die through which the melt can flow and be distributed. Gates are the sections where the melt enters the impression. Thus, sprues feed the runners, and the runners feed the gates.

To facilitate removal of the pattern from the sand mold, the pattern must be provided with an angle or taper called *draft*. If possible, parts should be designed so that natural draft is provided (Figure 6.2).

If the part to be cast has one completely flat surface, then the pattern can be made in one piece (Figure 6.2). If the production volume is sufficiently large, the two halves of the pattern are usually mounted on opposite sides of a single board or metal plate to form what is called a match-plate (Figure 6.1e). To avoid the necessity of forming the runner system by hand, the patterns that form the runners can also be mounted on the match-plate. For large castings a match-plate would become too large and heavy for convenient handling and the cope and drag half approach shown in Figure 6.1 is used.

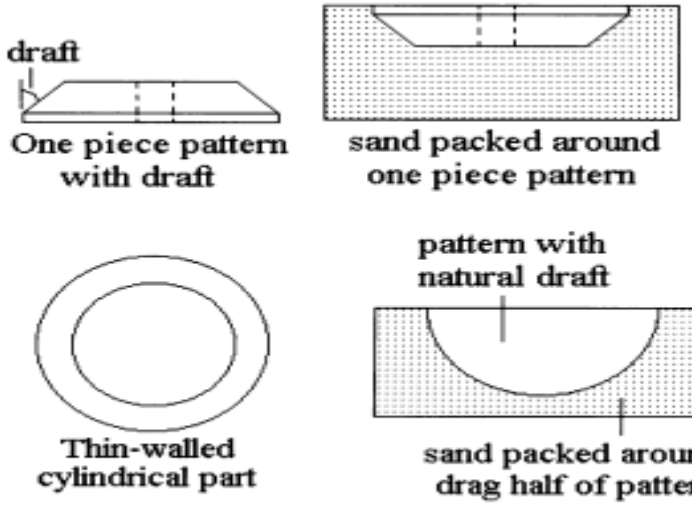


FIGURE 6.2 *An illustration of parts with draft and pattern ready for removal.*

INVESTMENT CASTING

- Investment casting, as well as die casting (which is discussed in the next section), can produce parts of similar geometric shapes and size. Since, as you will learn below, the disposable pattern is made by injecting wax into a mold, features that are difficult or costly to injection mold or die cast (e.g., undercuts) are also costly to investment cast.

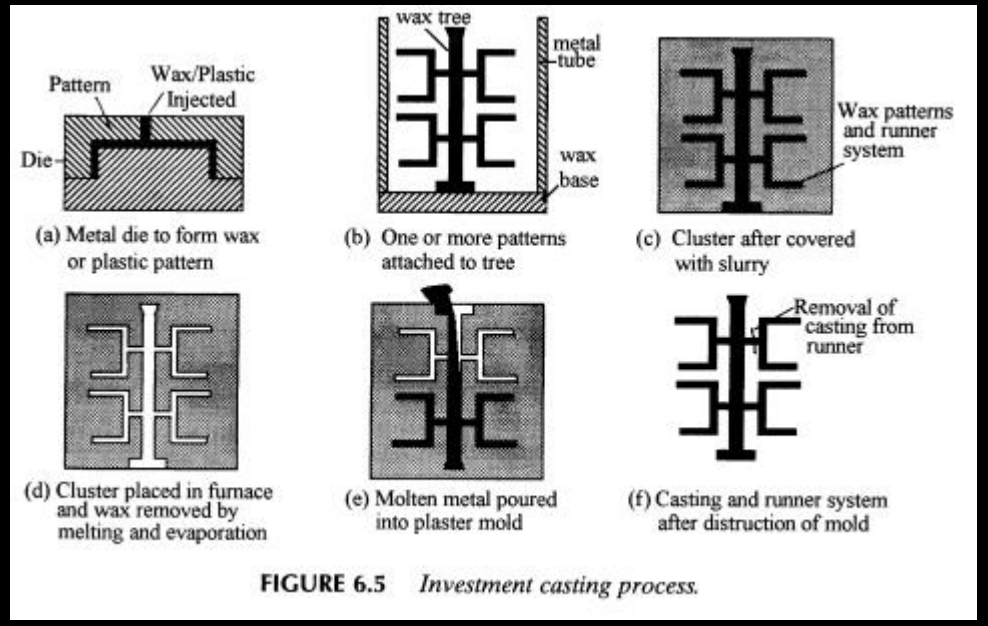


FIGURE 6.5 *Investment casting process.*

Investment casting

- Investment casting is typically used when low production volumes are expected (e.g., less than 10,000 pieces), whereas die casting tends to be used when high production volumes are expected.
- Investment cast parts can be made of a wide range of metal alloys including aluminum and copper alloys, carbon and low alloy steels, stainless steels, tool steels, and nickel and cobalt alloys. Die castings, as you will learn in the next section, must be restricted to metals with relatively low melting temperaturesm primarily zinc and aluminum.

Investment casting

- In investment casting (Figure 6.5), a metal die or mold is made by either machining or casting. The more complicated the shape (because of undercuts, for example), the more costly the metal dies.
- After the mold is formed, wax is injected to form a pattern. The external shape of the wax pattern resembles the internal shape of the mold. The wax pattern is removed from the mold and attached to a wax base that contains a gate. If the production volume is large enough several wax patterns are attached to a tree that contains the runners, gates, and other features that will feed and distribute the molten metal. A metal hollow tube is now placed over the wax patterns and a slurry--such as plaster of Paris--is poured to entirely cover the patterns. The completed mold is placed in an oven and the wax removed by melting and evaporation. Following this the mold is usually placed in a second oven to cure for 12 to 24 hours.

Investment casting

- To make parts, the mold cavity is filled with molten metal that is allowed to solidify. To facilitate filling of the mold the melt is poured while the mold is still hot. When the part has cooled, the mold is destroyed and the part removed. The tolerances and surface finishes achievable by investment casting are such that machining is not generally required.

DIE CASTING

- Like injection molding, die casting is a process in which a melt is injected under pressure into a metal mold. The melt then cools and solidifies, conforming to the internal shape of the mold.
- As in injection molding, as the part geometry becomes more complex, the cost of the mold increases. Also, as the wall thickness increases, the cycle time required to produce the part also increases. While the thin film, called flashing (Figure 6.6), that extrudes out through the spaces between parts of a mold is easily removed by hand in the case of injection-molded parts, the same cannot be said for die-cast parts. Hence, because of the difficulty of flash removal, internal undercuts are not generally die cast. Nevertheless, both injection molding and die casting can economically produce parts of great complexity.

- There are two types of die casting machines: a hot chamber machine (Figure 6.7) and a cold chamber machine (Figure 6.8).
- Both have four main elements: (1) a source of molten metal, (2) an injection mechanism, (3) a mold, and (4) a clamping system.

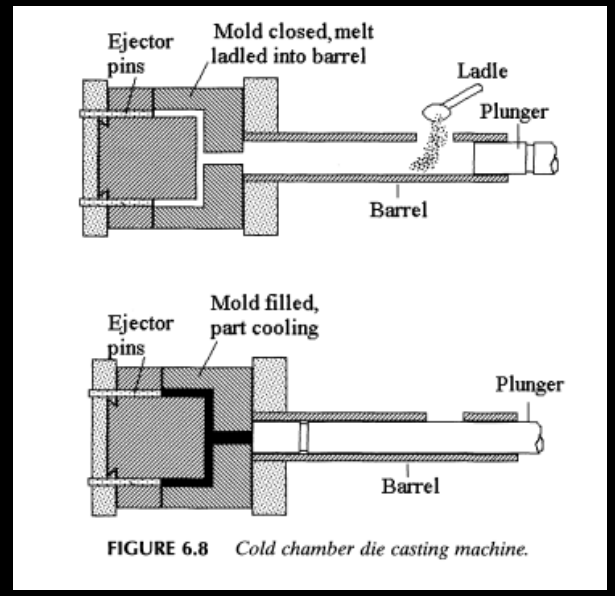


FIGURE 6.8 *Cold chamber die casting machine.*

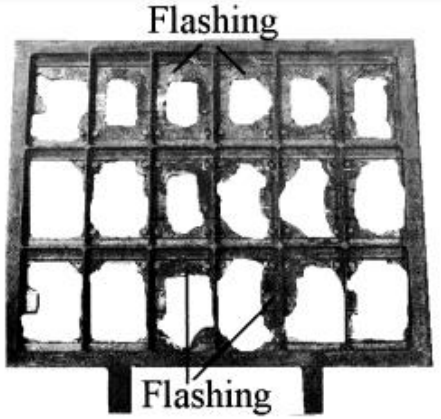


FIGURE 6.6 *Die cast part with flashing.*

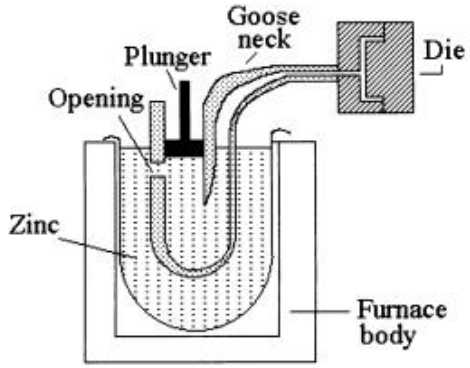


FIGURE 6.7 *Hot chamber die casting machine.*

جلسه پنجم و ششم

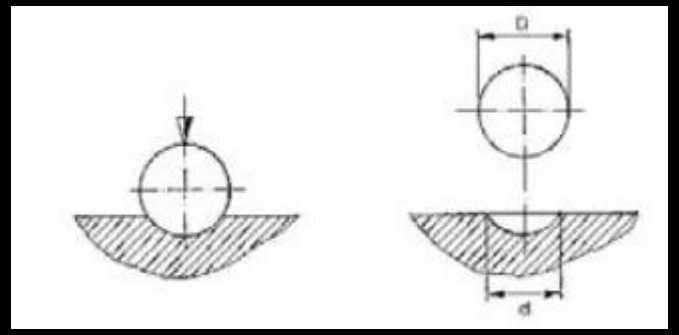
Vocabulary

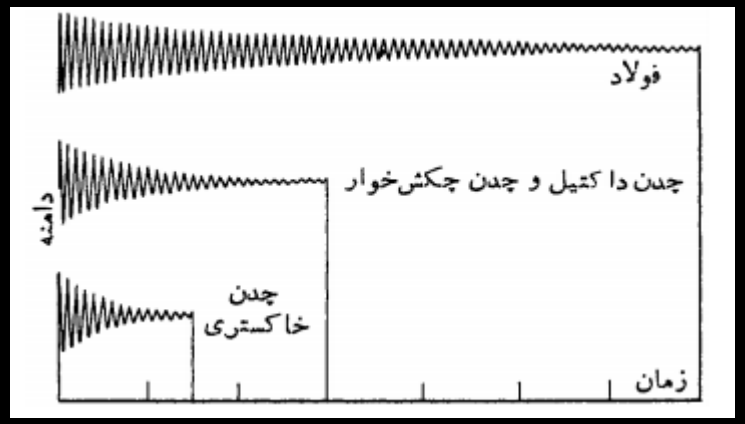
- **Duralumin**
- **Antimonial lead, hard lead**
- **antifriction metal**
- **scrap (metal)**
- **bought scrap**
- (foundry) returns, return scrap, remelt, home scrap

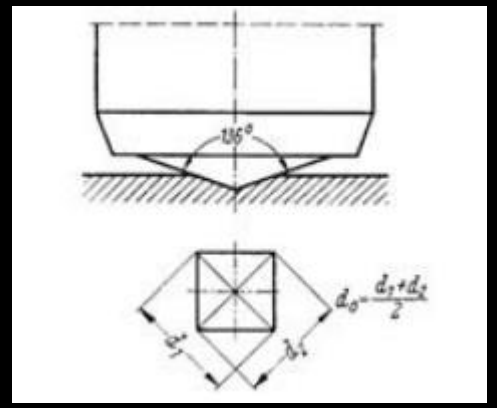
Vocabulary

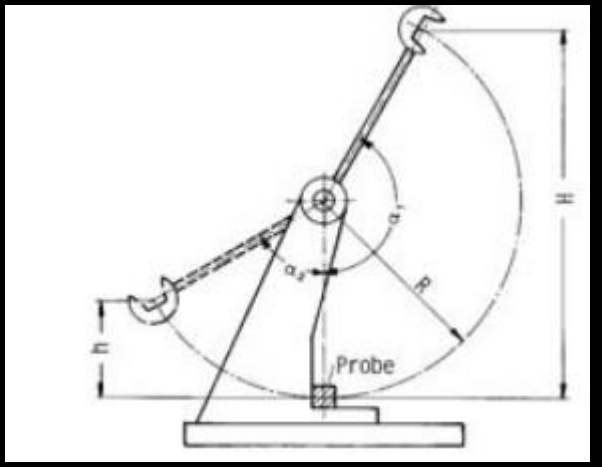
- Briquetted scrap, bundled scrap, packeted scrap, baled scrap
- **sprue**
- **Turnings**
- **borings**
- **Swarf**
- **runouts**
- **splashings**
- Steel scrap, scrap steel
- (cast) iron scrap, scrap iron, foundry iron

- file hardness test
- brinell hardness
- Vickers hardness, diamond pyramid hardness
- rockwell hardness
- hardness tester, hardometer
- indenter, penetrator
- standard hardness block
- damping capacity
- Impact test
- Charpy (impact) test
- Izod (impact) test









Present simple

1.1 THE PRESENT SIMPLE

To make the present simple of most verbs, use the base form (the infinitive without "to").

I eat lunch at noon every day.

The base form of the verb "to eat."

Adverbs of frequency are often used with the present simple.

She eats lunch at 2pm every day.

With "he," "she," and "it," add "-s" to the base form.

FURTHER EXAMPLES

We drink coffee every morning.

She drinks coffee every morning.

We start work at 9am.

He starts work at 11am.

They leave work at 5pm.

Rob leaves work at 7pm.

HOW TO FORM

The base form of the verb.

SUBJECT	VERB	REST OF SENTENCE
I / You / We / They	eat	lunch at 2pm every day.
He / She / It	eats	

With "he," "she," and "it," "-s" is added.

1.2 "-S" AND "-ES" ENDINGS

With some verbs, "-es" is added for "he," "she," and "it."
These include verbs ending with "-sh," "-ch," "-o," "-ss," "-x," and "-z."

I go to bed.

↓

He goes to bed.

"-es" is added to verbs ending with "-o."

I finish work.

↓

He finishes work.

"-es" is added to verbs ending with "-sh."

I watch TV.

↓

She watches TV.

"-es" is added to verbs ending with "-ch."

I cross the road.

↓

She crosses the road.

"-es" is added to verbs ending with "-ss."

I fix cars.

↓

She fixes cars.

"-es" is added to verbs ending with "-x."

Their phones buzz all day.

↓

His phone buzzes all day.

"-es" is added to verbs ending with "-z."

COMMON MISTAKES FORMING THE PRESENT SIMPLE

When the present simple is used with "he," "she," "it," or one person's name, it always ends in "-s" or "-es."

An "s" is added to the base form "start."

He starts work at 11am. ✓

He start work at 11am. ✗

"Start" without an "s" is only used for "I," "you," "we," and "they."

There is no need to add the auxiliary verb "do" when forming the present simple. It is only used to form questions and negatives.

I eat lunch at noon every day. ✓

I do eat lunch at noon every day. ✗

"Do" is only used as an auxiliary verb when forming negatives or questions.

1.3 "BE" IN THE PRESENT SIMPLE

"Be" is an important verb with an irregular present simple form.

I am 25 years old.

You are a chef.

"Are" also follows "we" and "they."

He is happy.

"Is" also follows "she" and "it."

HOW TO FORM

SUBJECT	"BE"	REST OF SENTENCE
I	am	happy.
You	are	
He / She / It	is	
We / They	are	

1.4 "HAVE" IN THE PRESENT SIMPLE

"Have" is an irregular verb. The third person singular form is "has" not "haves."

I have a garage.

"Has" is used for the third person singular: "he," "she," and "it."

She has a yard.

HOW TO FORM

SUBJECT	"HAVE"	OBJECT
I You We They	have	a garage.
He She It	has	

FURTHER EXAMPLES

I have a car. 

You have a sister. 

I have a painful back. 

They have the same dress. 

They have a new baby. 

The cat has a new collar. 

He has a cold. 

Thomas has a driving lesson today. 

Jack has a bad headache. 

Sarah has coffee with Tom every Tuesday. 

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Words To Learn This Week

abandon
keen
jealous
tact
oath
vacant
hardship
gallant
data
unaccustomed
bachelor
qualify

Words To Learn This Week

corpse
conceal
dismal
frigid
inhabit
numb
peril
recline
shriek
sinister
tempt
wager

Perposition

In:

in January	in 1980	in summer
in the afternoon	in Iran/Tehran	in the sky
in the morning	in ink	
in order to	in my presence	in my absence
in spite of	in the end	in front of
interested in	believe in	fall in love with

On:

on my birthday	on Friday	on foot
on bicycle	on my vacation	on the whole
on time	on the contrary	insist on
depend on	based on	spend on
rely on	concentrate on	congratulate on
on vacation	on the phone	on business

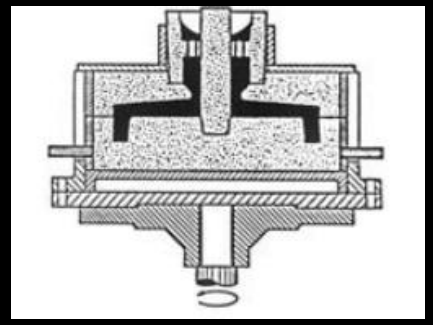
At:

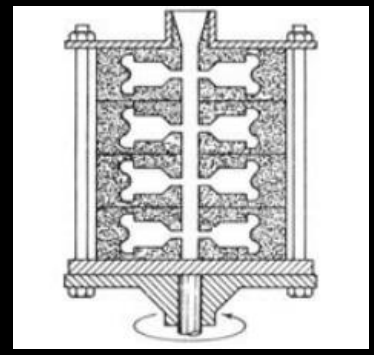
at ten o'clock	at night	at play
at sunset	at Christmas	at first
at full speed	at the table	at the door
at war/peace	at dawn	at sunrise
smile at	look at	laugh at

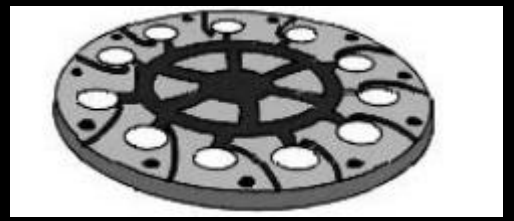
جلسه هفتم و هشتم

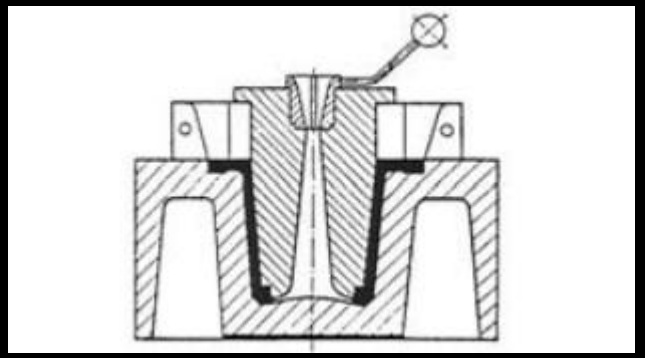
Vocabulary

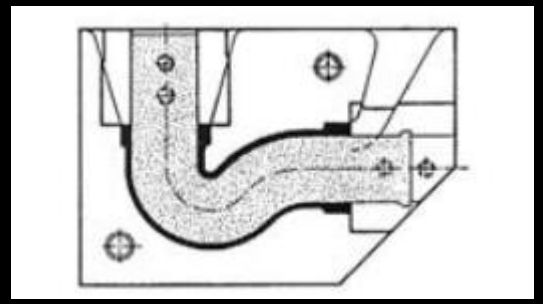
- **semi-centrifugal casting**
- **centrifuge(d) casting, centrifuging, center spinning**
- **spin casting**
- **permanent mold casting, gravity die casting**
- **semi-permanent mold casting**
- **chill casting**





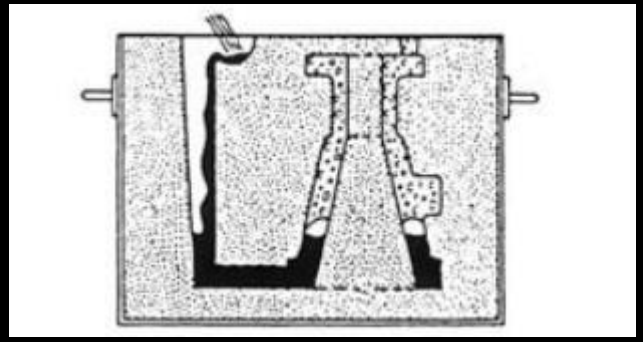






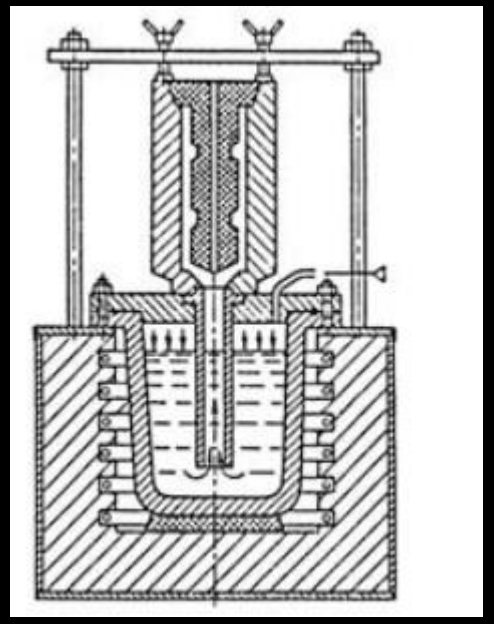
Vocabulary

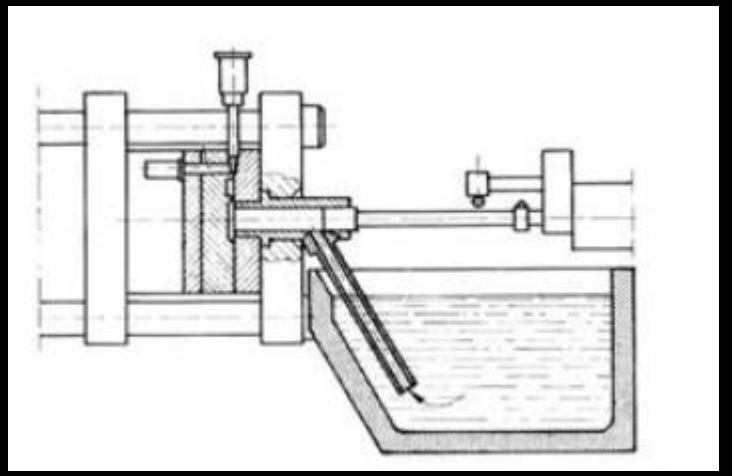
- Graphite mold casting
- Rubber mold casting
- **plaster mold casting**
- **Lost pattern casting, lost foam casting, cavityless casting, full mould casting, full mould process**
- **replicast process**

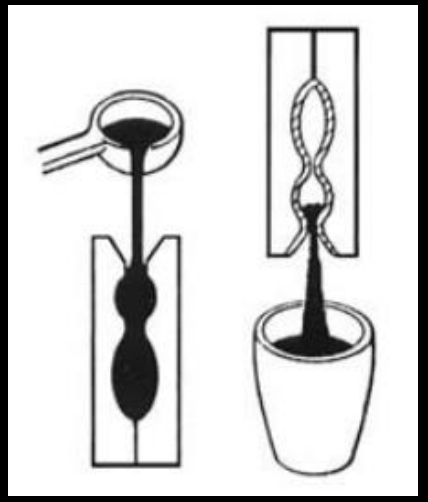


Vocabulary

- **low-pressure die casting**
- **(pressure) die casting**
- **evacuated die casting, vacuum (pressure) die casting**
- **static casting**
- **vibrational casting**
- **vacuum casting**
- Slush casting
- **belt-type disintegrator, belt aerator**
- **centrifugal cutter, centrifuge, centrifugal disintegrator**
- **Royer (sand mixer), Royer sand machine, sand royer**
- **sand cutter**
- **sprinkler**







Casting – John Campell

Grammer

04 The present continuous

The present continuous is used to talk about continued actions that are happening in the present moment.
It is formed with "be" and a present participle.

See also:
Present simple **1** Action and state verbs **50**
Infinitives and participles **51**

4.1 THE PRESENT CONTINUOUS

The present continuous is used to describe a current, continued action.

This is the present simple. It describes a repeated action or situation.

Julie usually wears jeans, but today she is wearing a dress.

The present continuous uses the verb "be."

This is the present continuous. It describes what is happening right now.

HOW TO FORM

SUBJECT	"AM / IS / ARE"	VERB + "-ING"	REST OF SENTENCE
She	is	wearing	a dress.

Present participle

FURTHER EXAMPLES

We are walking the dog.

He is washing the dishes.

They are talking on their phones.

The subject and the verb can be contracted.

They're fighting with each other.

She's relaxing at the moment.

It's raining a lot outside.

4.2 PRESENT PARTICIPLE SPELLING RULES

The present participle is formed by adding "-ing" to the base form of the verb. Some participles have slightly different spelling rules.

wear → **wearing**
Add "-ing" to form regular present participles.

choose → **choosing**
Last letter is an "-e."
Leave out "e."

tie → **tying**
Last letters are "-ie."
Change "-ie" to "y."

shop → **shopping**
Last letters are consonant-vowel-consonant and the final syllable is stressed.
Double the last letter, unless it's "w," "x," or "y."

TIP
Present participles follow the same spelling rules as gerunds.

FURTHER EXAMPLES

They're opening a store next week.
Don't double the last letter because the final syllable is not stressed.

Harry is always lying to his mother.

I am cutting some apples.

My uncle is writing a novel.

Terry is mopping the floor.

My mother is baking us a cake.

4.3 QUESTIONS IN THE PRESENT CONTINUOUS

To ask questions in the present continuous, swap the subject and the form of "be."

"He" is the subject.

He is playing tennis.

Is he playing tennis?

In a question, the verb moves to the start of the sentence.

This action is happening right now.

HOW TO FORM

"AM / IS / ARE"	SUBJECT	VERB + "-ING"	REST OF SENTENCE
Is	he	playing	tennis?

FURTHER EXAMPLES

Are they going to the park?

Is he cycling to work?

Is she eating pizza?

Are they working late?

Question words such as "what," "where," and "how" can be used before the verb to form open questions.

Where are we going today?

Are you coming to the party?

What are you eating for dinner?

Is it raining outside?

4.4 THE PRESENT CONTINUOUS NEGATIVE

To make the negative of the present continuous, add "not" after "be."

He is wearing a tie, but he { is not / isn't } wearing a hat.

Add "not" after "be" to make the negative. Contractions are also possible.

The present participle stays the same when you make the negative.

HOW TO FORM

SUBJECT	"AM / IS / ARE" + "NOT"	VERB + "-ING"	REST OF SENTENCE
He	is not	wearing	a hat.

The present participle doesn't change.

By: (mostly for transportation)

by walk	by mistake	by chance
by my watch	by heart	by check
by the sea	by night	by the air
by bus	by tomorrow	by the way

With: (mostly for tools)

with spoon	with his friend	with eye/ear
with white hair	with blue eyes	with pleasure
satisfied with	happy with	wrong with
trouble with	angry with	covered with
in accordance with	fall in love with	stay/keep in touch with

To:

lead to	belong to	complain to
grateful to	apologize to	next to
listen to	related to	invite to
owing to	send to	introduce to

Until / till / as far as

He studied until/till morning.
She walked as far as her home.

Leave / forget

I have left my bag at home.
She always forgets my phone number.

Beside / besides

He sat beside me. (کنار)
A man besides his friends went into the club. (بعلاوہ)

Remember / remind

I try to remember his name.
Please remind me to take my pill.

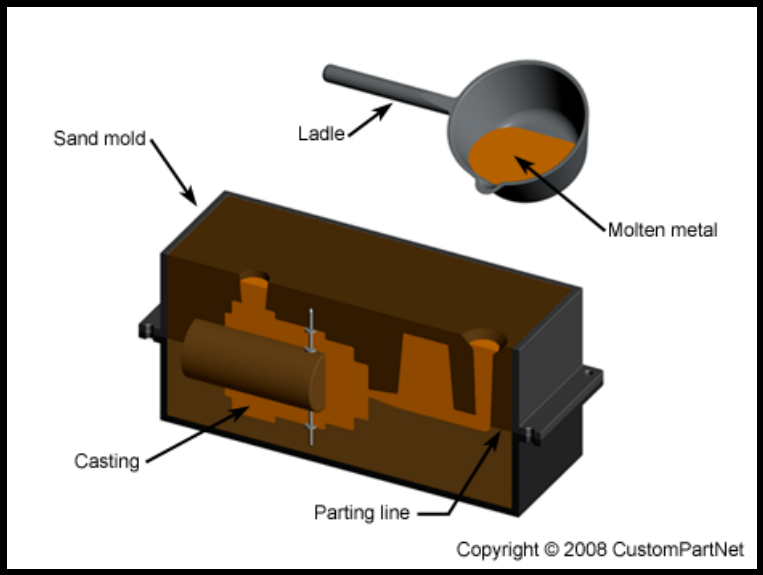
Different Types of Casting Processes Used in Manufacturing

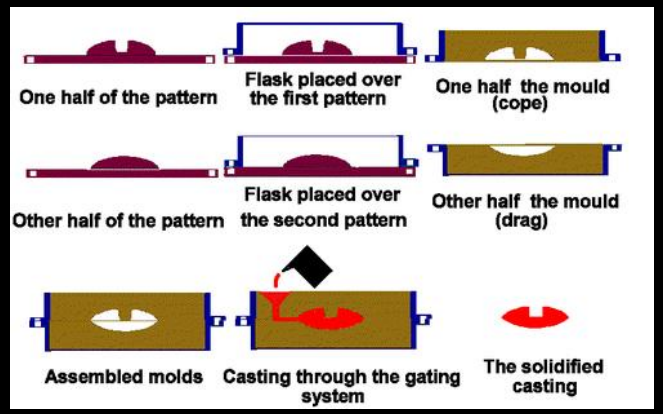
- Casting manufacturing is a process in which liquefied material, such as molten metal, is poured into the cavity of a specially designed mold and allowed to harden. After solidification, the workpiece is removed from the mold to undergo various finishing treatments or for use as a final product. Casting methods are typically used to create intricate solid and hollow shapes, and cast products are found in a wide range of applications, including automotive components, aerospace parts, etc

- Although casting is one of the oldest known manufacturing techniques, modern advances in casting technology have led to a broad array of specialized casting methods. Hot forming processes, such as die-casting, investment casting, plaster casting, and sand casting, each provide their own unique manufacturing benefits. Comparing both the advantages and disadvantages of the common types of casting processes can help in selecting the method best suited for a given production run.

Sand Casting

- Sand casting typically relies on silica-based materials, such as synthetic or naturally-bonded sand. Casting sand generally consists of finely ground, spherical grains that can be tightly packed together into a smooth molding surface. The casting is designed to reduce the potential for tearing, cracking, or other flaws by allowing a moderate degree of flexibility and shrinkage during the cooling phase of the process. The sand can also be strengthened with the addition of clay, which helps the particles bond more closely. Automotive products such as engine blocks are manufactured through sand casting.





Sand Casting

- Sand casting involves several steps, including patternmaking, molding, melting and pouring, and cleaning. The pattern is the form around which the sand is packed, usually in two parts, the cope and the drag. After the sand is compacted enough to replicate the pattern, the cope is removed and the pattern extracted. Then, any additional inserts called core boxes are installed and the cope is replaced. After the metal has been poured and solidified, the casting is removed, trimmed of the risers and gates that were used in the pouring process, and cleaned of any adhered sand and scale.

Sand casting

Sand casting's main advantages as a casting process include:

- Relatively inexpensive production costs, especially in low-volume runs.
- The ability to fabricate large components.
- A capacity for casting both ferrous and non-ferrous materials.
- A low cost for post-casting tooling.

Sand casting

- Despite its benefits, sand casting yields a lower degree of accuracy than do alternate methods and it can be difficult to sand cast components with a predetermined size and weight specifications. Furthermore, this process has a tendency to yield products with a comparatively rough surface finish.
- You can use the Thomas Supplier Discovery Platform to find Sand Casting Companies for your needs

Investment Casting

- Investment, or lost-wax, casting uses a disposable wax pattern for each cast part. The wax is injected directly into a mold, removed, then coated with refractory material and a binding agent, usually in several stages to build up a thick shell. Multiple patterns are assembled onto common sprues. Once the shells have hardened the patterns are inverted and heated in ovens to remove the wax. Molten metal is then poured into the remaining shells where it hardens into the shape of the wax patterns. The refractory shell is broken away to reveal the completed casting. Investment casting is often used to manufacture parts for the automotive, power generation, and aerospace industries, such as turbine blades.

Investment Casting

Some of the central advantages and disadvantages of investment casting include:

- A high degree of accuracy and precise dimensional results.
- The ability to create thin-walled parts with complex geometries.
- The capacity for casting both ferrous and non-ferrous materials.
- Relatively high-quality surface finish and detail in final components.

Investment Casting

Although it is highly precise, investment casting is usually more expensive than other comparable casting techniques and is typically only cost-efficient when sand or plaster castings cannot be used. However, the expense can sometimes be compensated for with reduced machining and tooling costs due to investment castings' quality surface results.

You can use the Thomas Supplier Discovery Platform to find Investment Casting Companies for your needs.

Plaster Casting

- Plaster casting is similar to the sand casting process, using a mixture of gypsum, strengthening compound, and water in place of the sand. The plaster pattern is typically coated with an anti-adhesive compound to prevent it from becoming stuck against the mold, and the plaster is capable of filling in any gaps around the mold. Once the plaster material has been used to cast the part, it usually cracks or forms defects, requiring it to be replaced with fresh material.

Plaster Casting

The advantages offered by plaster casting include:

- A very smooth surface finish.
- The ability to cast complex shapes with thin walls.
- The capacity for forming large parts with less expense than other processes, such as investment casting.
- A higher degree of dimensional accuracy than that of sand casting.

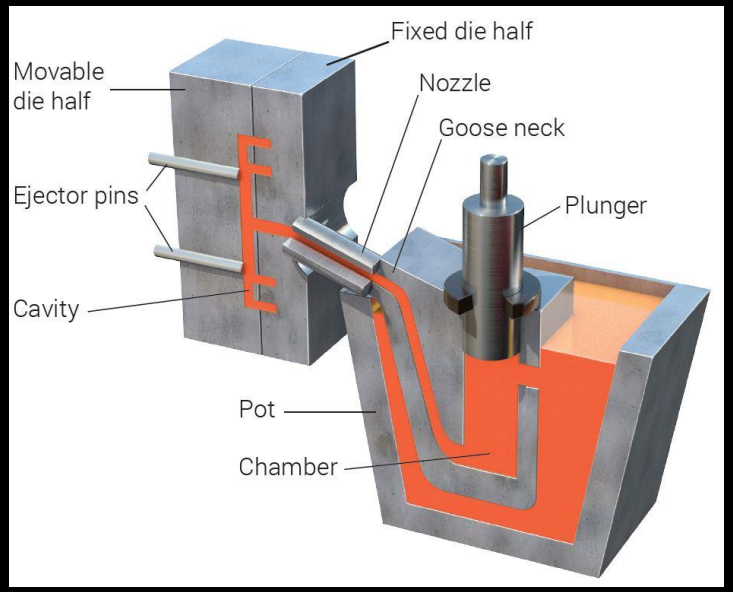
Plaster Casting

This process tends to be more expensive than most sand casting operations and may require frequent replacements of the plaster molding material. It is usually more effective and cost-efficient when the quality of the surface finish is an important requirement. Its application is generally limited to casting aluminum and copper-based alloys.

You can use the Thomas Supplier Discovery Platform to find Plaster Casting Companies for your needs.

Die Casting (Metal Casting Process)

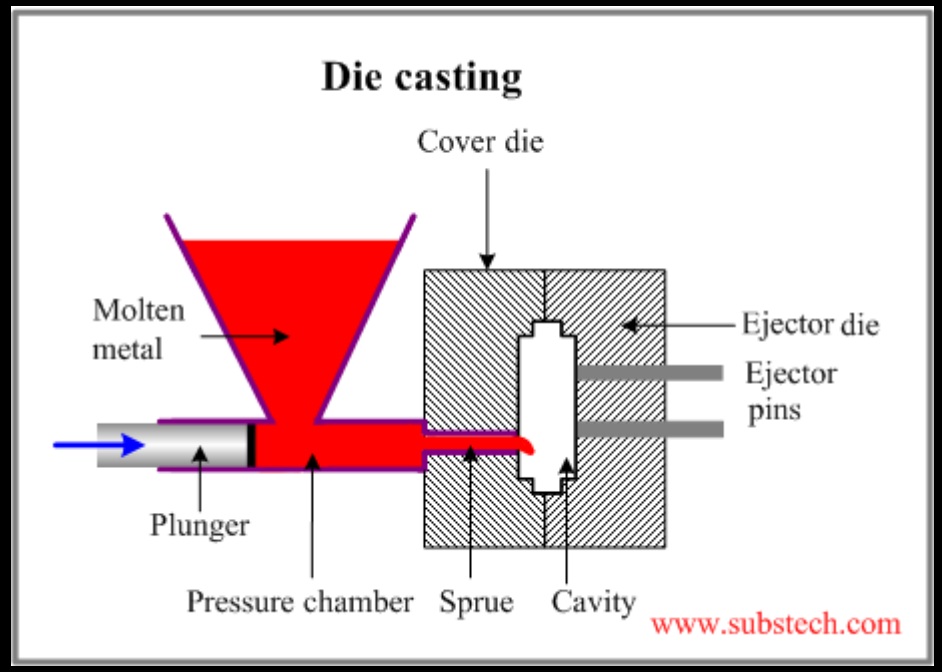
- Die casting is a method of molding materials under high pressure and usually involves non-ferrous metals and alloys, such as zinc, tin, copper, and aluminum. The reusable mold is coated with a lubricant to help regulate the die's temperature and to assist with component ejection. Molten metal is then injected into the die under high pressure, which remains continuous until the workpiece solidifies. This pressurized insertion is rapid, preventing any segment of the material from hardening before being cast. After the process is completed, the component is taken out of the die and any scrap material is removed.



Die Casting

A few of the major advantages provided by die casting include:

- Close size and shape tolerances.
- High component dimensional consistency and uniform design.
- A reduced need for post-casting machining.



Die Casting

- Despite its advantages, die casting as a metal casting process has relatively high tool costs, making it more cost-efficient in high-volume product runs. It can also be difficult to ensure the mechanical properties of a die-cast component, meaning these products usually do not function as structural parts. As the molds are typically two-piece, die casting is limited to products that can be removed from the mold without destroying the mold, as is done in other casting processes.
- For more information on Die Casting, you can review our Types of Die Casting guide, which goes into depth on the various types, alloys, and considerations for choosing a specific process/alloy combination.

- dust extractor, de-silter
- magnetic separator
- magnetic pulley, magnetic drum
- overband magnet, overband (magnetic) seperator
- sand cooler, sand cooling unit
- book mould, book die
- tilt mould
- slab mould

- **chill mould**
- Graphite mould
- **core (assembly) mould, all-core mould**
- **plaster mould**
- **ceramic mould**
- **(Croning) shell mould**
- **loam mould**
- **strickled mould, schabloned mould, swept mould, sweep mould**
- **cement (-bonded sand) mould**

زمان حال ساده:برای بیان کارهایی است که بطور تکراری انجام می شود.

فاعل+فعل ساده حالت + ...

I go to school every day.

They play football every evening.

Do they play football every evening?

She watches TV every night.

Does she watch TV every night?

Yes, she does. No, she does not.

زمان حال استمراری: برای بیان کارهایی است که همین حالا دارد انجام می شود.

فاعل+ **am, is, are**+ فعل + **ing**+ ... + **now**

He is going home.

Is he going home?

Yes, he is. No, he is not.

They are washing their car.

I am doing my homework.

دارم- داریم-

داری- دارید-

دارد- دارند-

زمان حال کامل: برای بیان کارهایی است که قبلا انجام شده و اثر آنها مهم تر از زمان انجام آنها است.

(علامتهای زمان حال کامل عبارتند از : yet, just, since, for, recently, lately, times)

– ام	– ایم
– ای	– اید
– است	– اند

فاعل + **have / has + P.P. +...**

I have seen this film three times so far.

She hasn't left home yet.

He has written the letter since 9 o'clock.

Have you eaten your lunch?

Yes, I have. No, I have not.

زمان حال کامل استمراری: برای بیان کارهایی است که از قبل شروع شده و هنوز تمام نشده است.

فاعل+ have / has been + فعل + ing

It has been raining since this morning.

I have been working here since last week.

زمان گذشته ساده: برای بیان کارهایی است که قبلا انجام شده و تمام شده و در اینجا زمان انجام کار مهم تر است.

قید زمان گذشته + ...+زمان گذشته فعل + فاعل

We worked hard yesterday.

Did you work hard yesterday.

She went to Tehran last week.

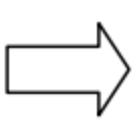
Did she go to Tehran last week?

زمان گذشته استمراری: برای بیان استمرار کارهایی است که در زمان گذشته انجام شده و معمولا با یک زمان گذشته ساده همراه است.

قید زمان گذشته + ...+ing + فعل + **was\were** + فاعل

I was writing a letter last night.

We were reading English yesterday.



While I was washing the dishes, she arrived.

I was washing the dishes when she arrived.

داشتم	–	داشتیم	
داشتی	–	داشتید	
داشت	–	داشتند	

زمان گذشته کامل: برای بیان کارهایی است که در زمان گذشته قبل از کار دیگری انجام شده و معمولا با یک زمان گذشته ساده همراه است.

- بودم	**- بودیم**
- بودی	**- بودید**
- بود	**- بودند**

فاعل + had + P.P. + ...

They had left the station when I went there.

Had they left the station when you went there?

Yes, they had.

زمان گذشته کامل استمراری: برای بیان استمرار کارهایی است که در زمان گذشته انجام شده و طول زمان را هم بیان می کند.

فاعل + **had been** + فعل + **ing** + ...

I had been working for two hours before he came.

Had you been working for two hours before he came?

Fall	fell	fallen	افتادن
Fell	felled	felled	قطع کردن
Feel	felt	felt	احساس کردن
Fill	filled	filled	پر کردن

زمان آینده ساده: برای بیان کارهایی است که قرار است در آینده انجام شود.

قید زمان آینده + ... + حالت ساده فعل + **will** + فاعل

I will go to park tomorrow.

They will buy a house next week.

Will they buy a house next week?

Yes, they will. No, they won't.

زمان آینده استمراری: برای بیان کارهایی است که قرار است در آینده انجام شود و از زمان دقیق انجام آن در آینده اطلاع داریم.

فاعل + **will be** + فعل + **ing** + ...

We will be sitting for exam tomorrow at this time.

I will be driving to Tehran tomorrow at this time.

زمان آینده کامل: برای بیان کارهایی است که قرار است درزمان آینده قبل از کار دیگری انجام شود.

فاعل + **will have + P.P. + ...**

I will have finished this book by Peter come back.

They will have written the letters before tomorrow.

Will they have written the letters before tomorrow?

زمان آینده کامل استمراری: برای بیان کارهایی است که درزمان مشخصی در آینده قرار است کامل شود.

فاعل + **will have been** + فعل + **ing** + ...

By the time we get home, I will have been driving for three hours.

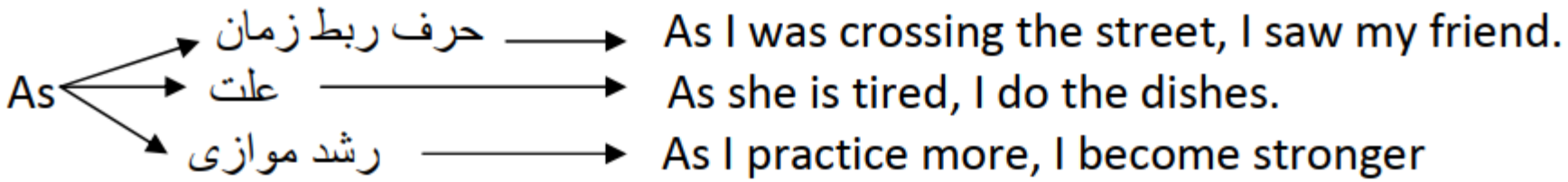
By the end of this week, we will have been working here for six months.

3713 = three thousand, seven hundred and thirteen
(year) 1957 = nineteen hundred and fifty seven = nineteen, fifty seven
1500 BC (before Christ) = one thousand five hundred BC = fifteen hundred
2006 = two thousand (and) six
⅔ = two third
$ 100.99 = one hundred dollars ninety nine
000 = triple oh
0.8% = zero point eight percent

Rob

... rob + sb + from + sth.....	محروم کردن کسی از چیزی

They have robed the women from right of freedom.



As soon as: به محض اینکه
As soon as they arrived, we will leave.

As long as: مادامی که ، تا زمانی که
I will never go there, as long as I live.

As far as:تا آنجایی که
As far as I am concern, they have changed their house.

In addition: به علاوه
They changed their house; in addition they bought a new car.

In addition to: به علاوه + N/ Ing
In addition to teaching, she works in a restaurant as well.

Besides: به علاوه + N/ ing
Ten students besides their teachers went into the class.

Furthermore: جمله + علاوه بر
It is very cold outside; furthermore, it is late.

Raise: بالا بردن ، افزایش دادن ، بزرگ کردن ، مطرح کردن

Raise your hand if you have a question. بالا بردن
They raised their prices. افزایش دادن
I was born and raised in Tehran. بزرگ شدن
You raised a good question. مطرح کردن

Contain: شامل شدن
The library contains a number of valuable books.

Content: محتوا/ راضی
He was a good friend and I was content.
She kept the content of the letter secret.

In other word: به عبارت دیگر
He is economical too much; in other word, he is stingy.

On the other hand: از طرف دیگر
I don't like to eat out; on the other hand, I should save money.

Make

Make an attempt: تلاش کردن

Make a mistake: اشتباه کردن

Make an appointment: نوبت گرفتن

Make a presentation: نطق کردن

Make progress: پیشرفت کردن

Make a speech: سخنرانی کردن

Make a difference: تاثیر گذاشتن/ فرق کردن

Make friend: دوست پیدا کردن

Make money: پول جمع کردن

Make the most of: حد اکثر استفاده را کردن

Make the bed: رختخواب را مرتب کردن

Make noise: سر و صدا کردن

Make a gesture: ایماء و اشاره کردن

Make a decision: تصمیم گرفتن

Concern: نگرانی

Growing concern: نگرانی رو به رشد

Major concern: نگرانی عمده/ اصلی

Express concern: ابراز نگرانی کردن

Concern about: نگران چیزی بودن

come about: اتفاق افتادن

come across: بطور تصادفی برخورد کردن

come back: برگشتن

come from: اهل جایی بودن

come out: منتشر شدن

Role

Have a role: نقش داشتن

Play a role: ایفا کردن نقش

Important role: نقش اساس

Key role: نقش کلیدی

Major role: نقش عمده

Central role: نقش مرکزی/ اصلی

contact

close contact: تماس نزدیک

direct contact: تماس مستقیم

face to face contact: ارتباط رو در رو

in contact with: در تماس با

keep in contact: در تماس بودن

Plan: طرح/ تصمیم داشتن
Plane: هواپیما
Plant: گیاه/ کاشتن
Planet: سیاره
Plain: دشت/ جلگه
Plate: بشقاب

consist of
to be composed of
Include= contain
to be made up of

شامل شدن
تشکیل شدن از

In relation to: در ارتباط با	raise an issue: مساله ای را مطرح کردن
In comparison to: در مقایسه با	avoid an issue: از مساله ای اجتناب کردن
In contrast to: در تضاد با	important/key/major issue: مساله مهم، کلیدی
In favor of: به نفع	complex issue: مساله پیچیده
In accordance with: مطابق با	political issues: مسایل سیاسی
In contact with: در تماس با	social issues: مسایل اجتمایی
In spite of: علی رغم	environmental issues: مسایل محیطی

Extreme: شدید
Extreme poverty: فقر شدید
Extreme care: مراقبت شدید

extreme: غیر معمول
extreme example:مثالهای غیر معمول
extreme condition:شرایط غیر معمول

In spite of = despite

They went to the beach in spite of rainy weather.
Despite our effort, they decided to close the school.

Provide + sth + for + sb

Provide + sb + with + sth

چیزی را برای کسی فراهم کردن

This library is made to provide new books for students.
This library is made to provide students with new books.

Customer/ client/ patient

Customer به مشتری مغازه گفته می شود، client به مراجعین بانکها و قضات می گویند و patient به بیماری که به دکتر مراجعه می کند، گفته میشود.

Business/ work/ job

Business به معنی مطلق گرفتاری یا سرگرمی است، خواه شغل باشد یا غیر شغل، مثلا خواندن روزنامه از این قبیل است، work به معنی کار است، خواه شغل باشد و خواه بدون مزد و به صورت تفریحی باشد ولی job شغل است مانند شغل قصابی برای قصاب.

Latter/ late

Later به معنی «دیرتر» ولی latter به معنی « دومی» از دو چیز است و در مقابل former (اولی از دو چیز) قرار دارد.

I have two friends, Mary and Jack, the former is a student and the latter is an engineer.
See you later.

Under the condition: تحت شرایط
Under the pressure: تحت فشار
Under the observation: تحت نظر
Under the supervision: تحت مراقبت
Under the protection: ثحت حمایت
Under the construction: در دست ساخت
Under the impression: تحت تاثیر
Under the influence: زیر نفوذ
Under the discussion: تحت بررسی
Under the control: تحت کنترل
Under the education: تحت تعلیم

steal: دزدیدن
rob: سرقت کردن/ دستبرد زدن
mug: کیف قاپیدن
pilfer: دله دزدی کردن
burgle: دزدی از خانه
hijack: دزدیدن هواپیما
pirate: دزد دریایی
abduct: آدم دزدیدن
abduction: آدم ربایی
kidnap: آدزدیدن
kidnapper: آدم ربا

thief:دزد
mugger:کیف قاپ
pilferer:دله دزد
burglar:دزد خانه
hijacker:هواپیما ربا

صفت مطلق/متساوی	صفت تفضیلی (تر)	صفت عالی (ترین)
Good/ well	better	The best
Bad/ ill	worse	The worst
little	less	The least
Much/ many	more	The most
far	Farther further	The farthest The furthest