

Introduction of Drum Flaker



Contents

1、 Company Profile about FUJI KOKI CO.,LTD.

1 - 1、 Company profile of FUJI KOKI CO.,LTD.

1 - 2、 The outline of the business

2、 The merit to flake

2 - 1、 The purpose of flaking

3、 Summary about Drum Flaker

3 - 1、 Summary about Drum Flaker

3 - 2、 Supply system of melting liquid

3 - 3、 The advantage of leveling roll

3 - 4、 Cooling system in the drum

3 - 5、 Safety design



Contents

4、Parameter and the tendency of the product

4 - 1、Parameter and the tendency of the product

4 - 2、Rotation speed of the drum

4 - 3、Temperature of the cooling water

4 - 4、Clearance of the drum and the leveling roll

4 - 5、The table about parameter and the tendency

5、An example

5 - 1、Flow drawing for reference

5 - 2、Arrangement drawing for reference

6、Experimental unit

1 - 1、 Company Profile of FUJI KOKI CO.,LTD.

- **Company name** : FUJI KOKI CO.,LTD
- **Establishment** : March 26, 1963
- **Capital** : 95,000,000 JPY
- **Employees** : 100
- **Head quarters** : Ichinomiya-Shi,
Aichi-ken, Japan
- **Branch office** : Tokyo, Osaka, Kyusyu
- **Overseas base** : Korea





1 - 2、 The outline of the business

We are always concentrating our knowledge and Technology into the product by means of the newest facilities under the best condition.

In particular, we have excellent technology in the following business.

- 1) Dust Collecting**
- 2) Powder Handling**
- 3) Chemical Machinery**
- 4) Plant Engineering**

1 - 2、 The outline of the business

Environment dust collector



Double Disc Dryer



Fixed quantity discharge machine



Flow Conveyor



Dust collector For pneumatic conveying system



Double Drum Dryer



POW Pump for low pressure sanitary use

2 - 1、 The purpose of flaking

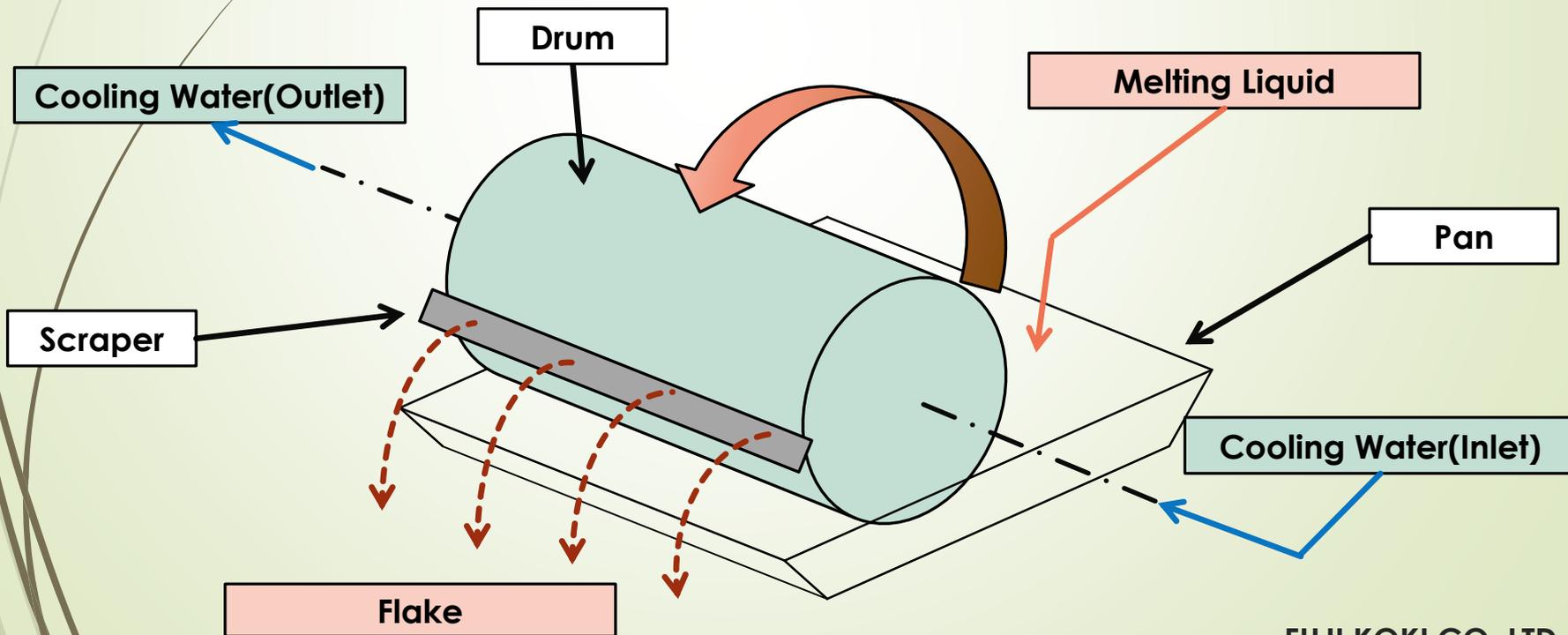
The purpose of flaking is to cool and solidify fusion liquid. The solidified product is shaped thin flake. The flake is capable of conveyance, safekeeping, transportation, and discharging.

| | Fusion liquid | Flake |
|----------------|---|--|
| Handling | × There is a possibility that the product hardens in the pipe. | ○ It's possible to carry that by an ordinary conveyer. |
| Safe Keeping | × The fusion liquid is easy to oxidize. | ○ Because it's a solid, it's difficult to deteriorate compared with liquid. |
| Transportation | × Fusion liquid hardens by heat-radiation. Re-heating | ○ It's possible to put the flake in a flexible container bag. |
| Discharging | × Heat-resistance is requested of the filling machine. | ○ Because a handling is easy to do, the flake is easy to discharge. |

3 - 1、 Summary about Drum Flaker

Cooling water is supplied inside the drum.

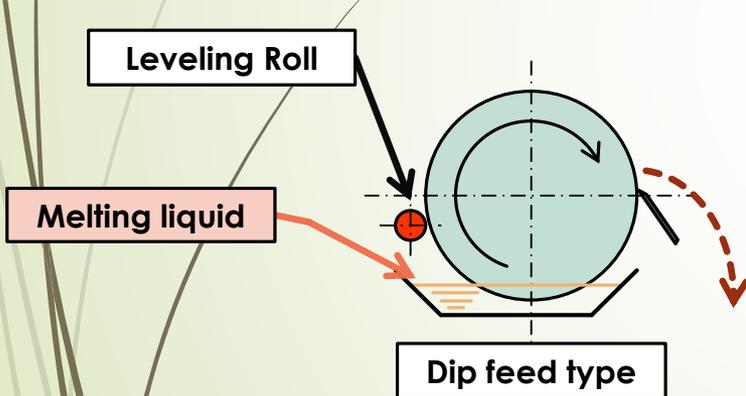
Melting liquid is stuck in the surface of the drum, is cooled and solidify. The production thing which is Solidified is scratched with a scraper and it is taken.



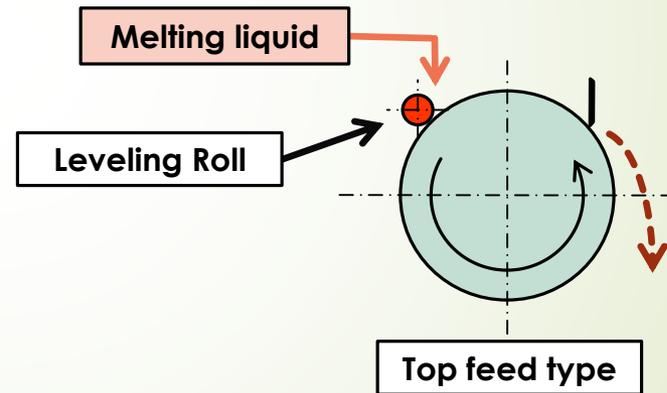
3 - 2、 Supply system of melting liquid

There are 2 ways of supplying system of melting liquid. We recommend easy “Dip feed” of operation control.

It's possible to put the roll for “Top feed” as an option for high viscosity liquid.



Melting liquid is poured into the pan. This is standard way and operation control is easy compared with the Top feed type. You can put a liquid level sensor on the pan and adjust the provision.



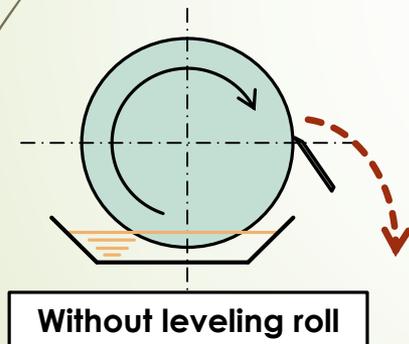
The Dip feed type can't dispose of high viscosity liquid. When viscosity liquid is inserted between the drum and the roll, the high viscosity liquid is stuck in drum. An adjustment in a clearance of the drum and the roll takes time and effort.

3 - 3、 The advantage of leveling roll

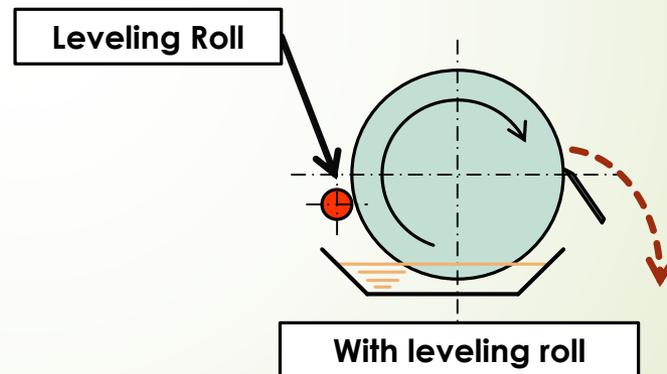
When the leveling roll is put on this machine, the thickness of flake can be controlled.

When controlling the thickness of the flake, it's easy to handle low polymer. And the smash is also good.

It's easy to correspond to a change in the viscosity.



The thickness of the flake is decided by the viscosity. When the viscosity changed, the thickness of the flake changes. There is bad influence in a handling.



The thickness of the flake becomes uniform by the leveling roll.

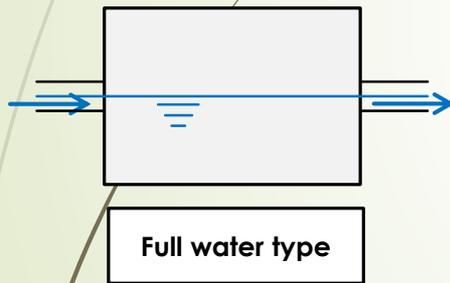
It's possible to make a product of the same thickness with the different viscosity.

3 - 4、 Cooling system in the drum

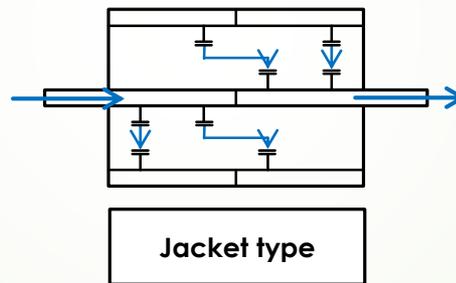
There are 3 ways of cooling system of drum flaker.

When the tarnish of the pipes is jammed into a sprayer nozzle, large-scale repairing is needed.

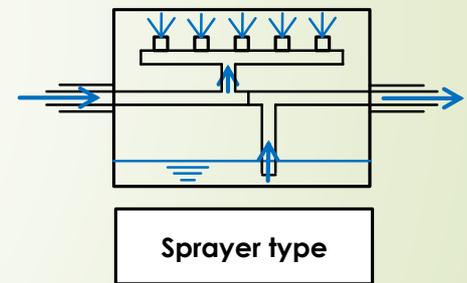
So we adopt the jacket type.



Cooling water is filled in the lower half Inside the drum. The structure is easiness, but because the water which became lukewarm is left, the cooling ability falls.



Cooling water flows in the jacket. Without being left, lukewarm water will be Discharged immediately.



Cooling water is sprayed in the drum. The ability is high, but refuse is sometimes Jammed into a sprayer nozzle.

Compressed air is needed.

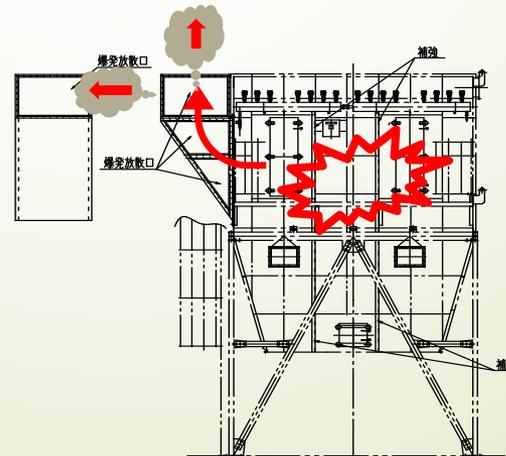
3 - 5、 Safety design

We incorporate the following item into a design for fine particle explosive prevention.

- 1) Air-tightness drum cover
- 2) N₂ gas purge
- 3) The earth connection lug
- 4) The scraper made of resin
- 5) The equipment which misses the explosive power



A reference example
(For Dust Collector)





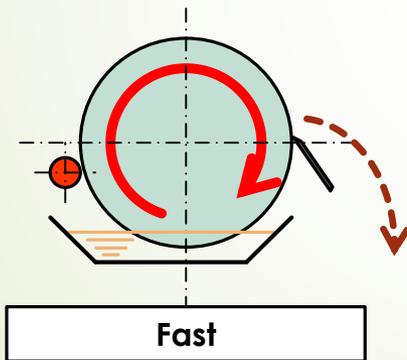
4 - 1、 Parameter and the tendency of the product

When the following parameter is changed, it's possible to change the several conditions of the flake.

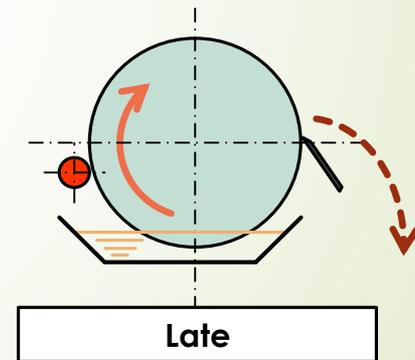
- Rotation speed of the drum**
- Temperature of the cooling water**
- Clearance of the drum and the leveling roll**

4 - 2、 Rotation speed of the drum

When the rotation speed of the drum is become faster, the amount of the production becomes a lot more. Rotation speed is the same meaning as cooling time. When the rotation speed is become faster, so the temperature of the flake rises.



- Amount of the production ↑
- Temperature of the flake ↑

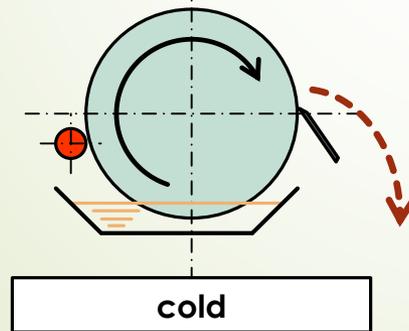


- Amount of the production ↓
- Temperature of the flake ↓

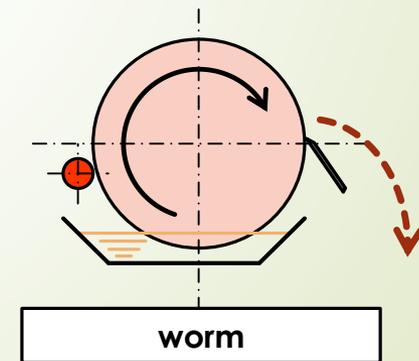
4 - 3、 Temperature of the cooling water water

When the temperature of cooling water is low, the amount of the production rises. The temperature of a flake also become low.

But, the liquid of high viscosity isn't sometimes stuck in a too cold drum. When cooling water is changed to warm water at that time, it becomes easy to stick to the drum.



- Amount of the production ↑
- Temperature of the flake ↓



- Amount of the production ↓
- Temperature of the flake ↑

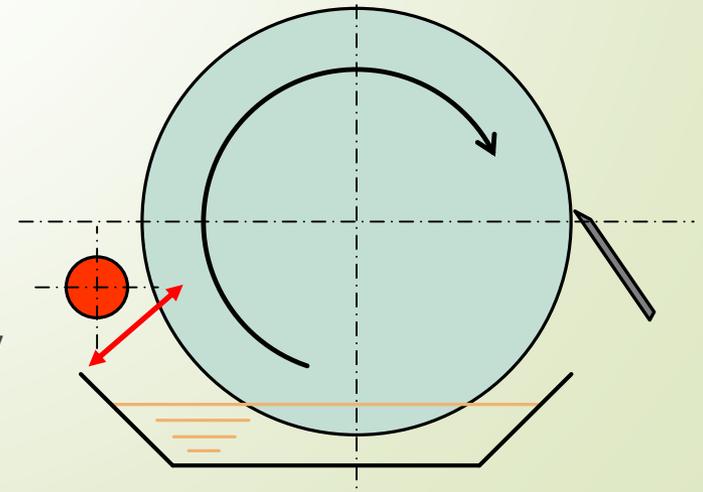
4 - 4、 Clearance of the drum and the leveling roll

When the clearance of the drum and the leveling roll is made wide, the flake becomes thick. Because it's difficult for a thick flake to break, there are few fine dust.

When the clearance is made small, the flake tends to become thin and the temperature fall. When a flake is thin, it's easy to break, and handling ability is good.

When the clearance is changed, the thickness of the flake can be adjusted.

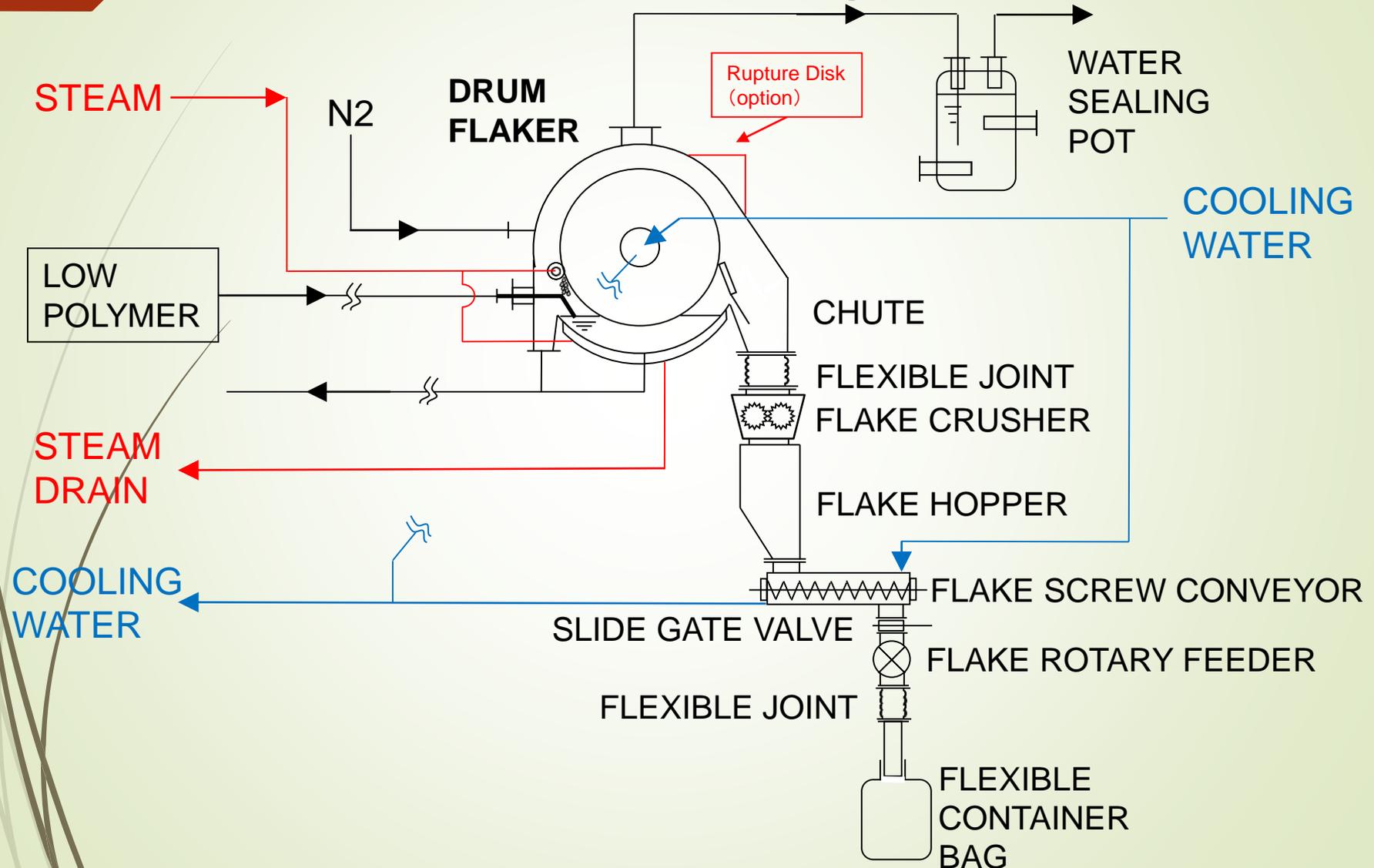
It can correspond to various kinds of low polymers (the viscosity)



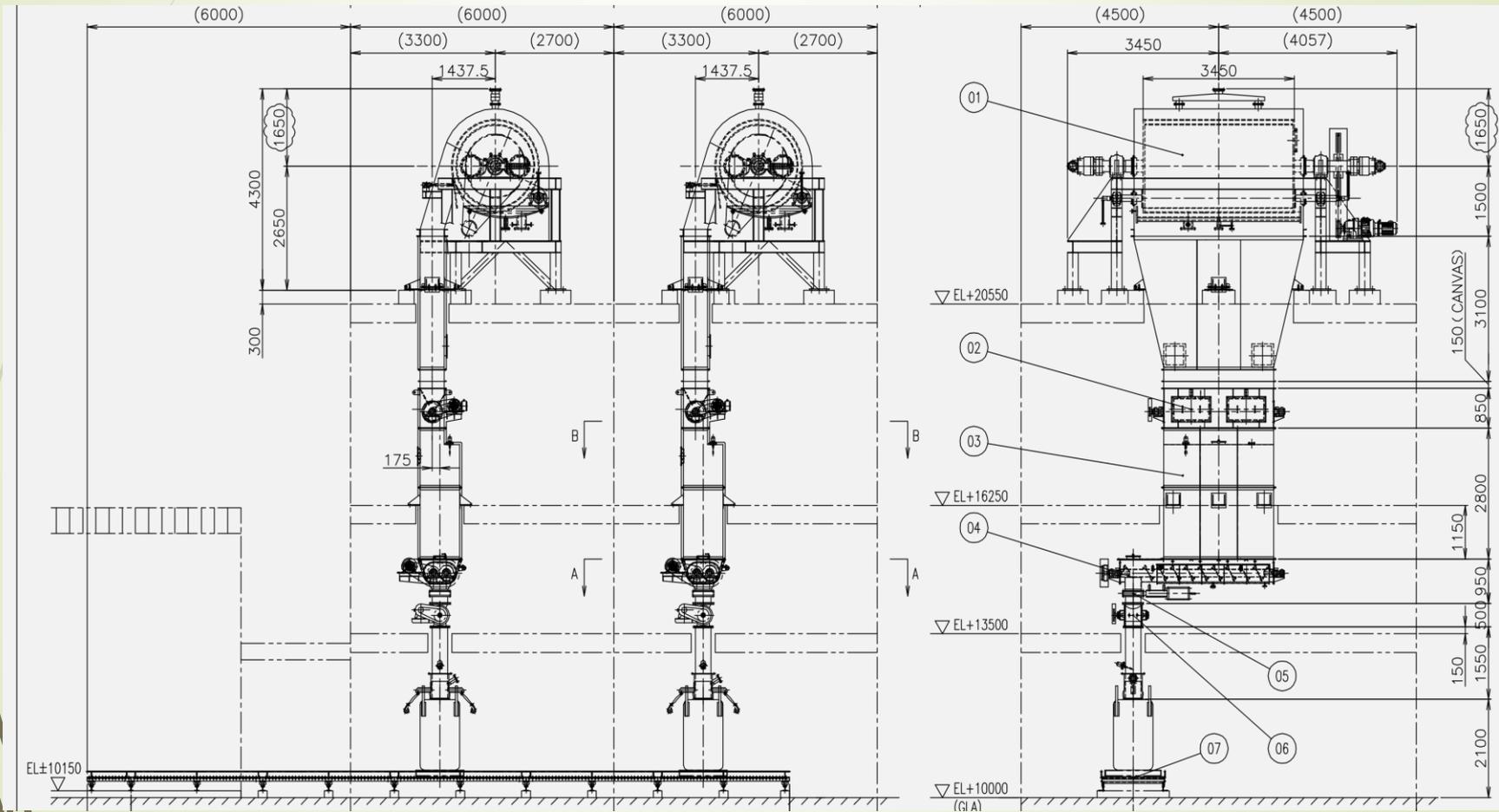
4 - 5、 The table about parameter and the tendency

| Parameter | Influence | |
|---|---|---|
| Rotation speed of drum | Fast ←————→ <ul style="list-style-type: none"> • Amount of the production ↑ • Temperature of the flake ↑ | —————→ Late <ul style="list-style-type: none"> • Amount of the production ↓ • Temperature of the flake ↓ |
| Temperature of cooling water | Low ←————→ <ul style="list-style-type: none"> • Amount of the production ↑ • Temperature of the flake ↓ | —————→ High <ul style="list-style-type: none"> • Amount of the production ↓ • Temperature of the flake ↑ |
| Note: The melting liquid with the high viscosity isn't stuck in a too cold drum. | | |
| Clearance of the drum and the roll | Wide ←————→ <ul style="list-style-type: none"> • Thickness of the flake ↑ | —————→ Small <ul style="list-style-type: none"> • Thickness of the flake ↓ |

5 - 1、 Flow drawing for reference



5 - 2、Arrangement drawing for reference



6、 Experimental unit

We have an experimental unit of a Drum Flaker in our factory.

You can do a cooling experiment and confirm the material feature of the flake and the powder.



【The specification of the experimental unit】

- Size of drum : $\phi 630 \times 300L$
- Surface area of drum : $0.6m^2$
- Material of drum : SB410 +
Hard chrome plating