



**Wuhan Jian Heng Industry Technology Co.,Ltd**

## **Cast steel castings by V-process casting**

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# V-process casting Application Field on Cast Steel

railway castings

engineering machinery castings

mining machinery castings

heat treatment equipment castings

coal mine machinery castings

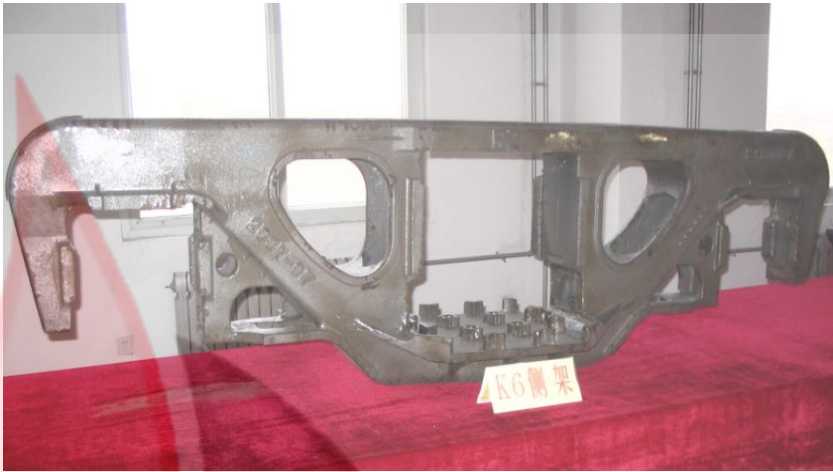
public construction castings

metallurgy field castings

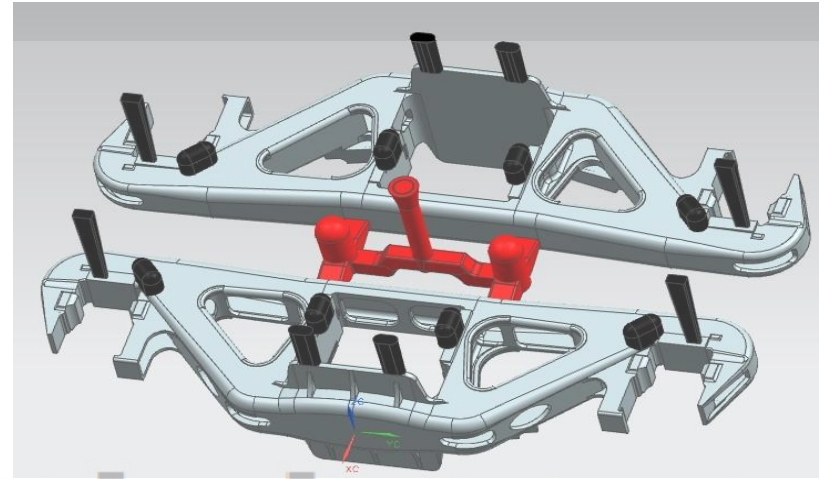
valves industry castings

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# railway castings-side frame



casting dimension:  $2386 \times 625 \times 440\text{mm}$   
casting weight: 480kg



the design of gating system



2018/4/8 Sunday  
core setting



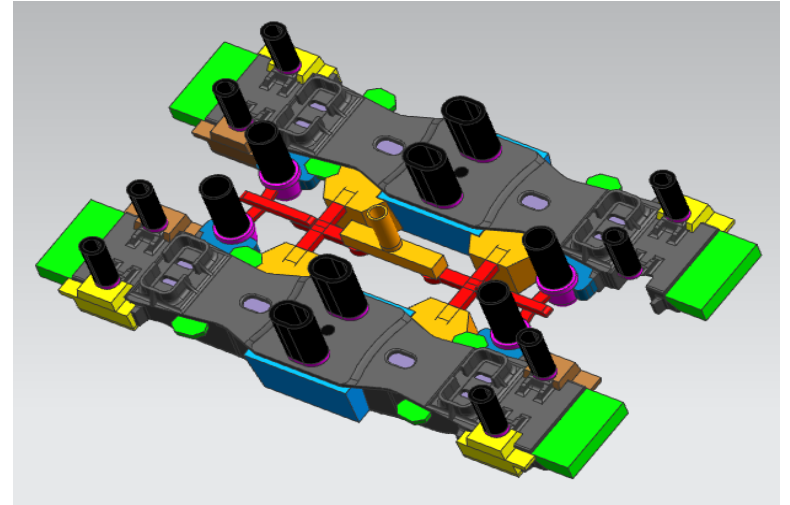
casting after shaking out



# railway castings-bolster



casting dimension:  $2429 \times 508 \times 427$   
casting weight: 880kg



the design of gating system



2018/4/8 Sunday  
setting cores



the casting after shake out

# railway castings-coupler



train coupler casting, weight: 190kg

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mold with cores



castings after shaking out



# railway castings-frog

Length:6300mm

Weight:1.3t.

Material :Maganese steel



flask size:7100×780×300/300mm.  
the mold which is coated with  
forsterite sand coating is also made  
of forsterite sand ,and the cores are  
made of silicate bonded sand.

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# Engineering Machinery castings-axle box



machined casting



casting after shaking out



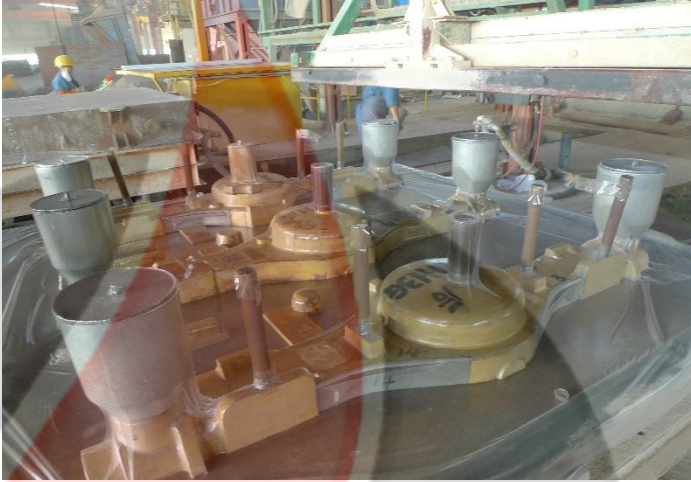
surface after shaking out



gas pressure test



# Engineering Machinery castings-axle box



molding procedure:film covering



molding procedure:core setting



as-cast casting



machining procedure



# Engineering Machinery castings

## -Axle box cover



drag mold



machined castings



cope mold

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# Engineering Machinery castings

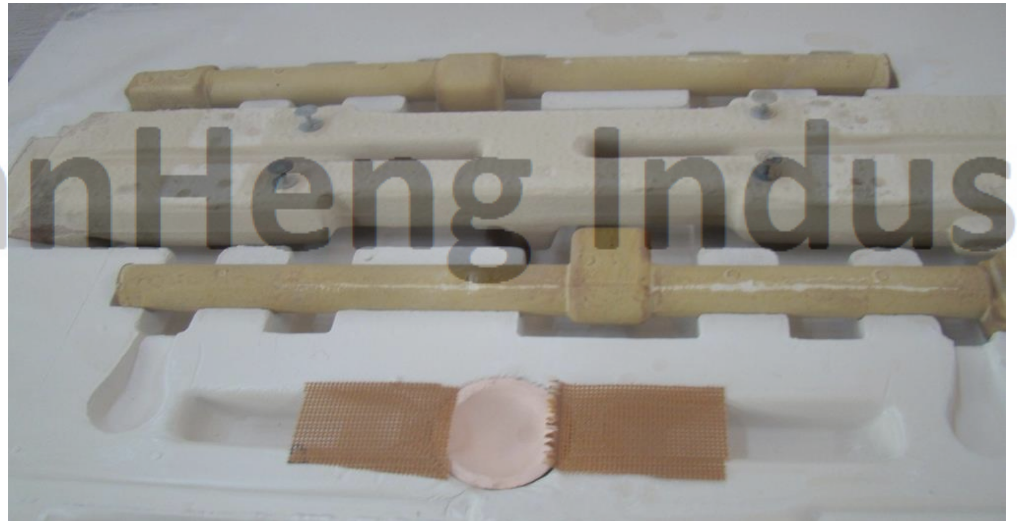
## -track shoe



track shoe by V-process are widely used in track-belt engineering machinery; high surface quality contributes its life



Top pattern (single riser)



Bottom pattern(filter screens and cores)



# NASA crawler-transporter track shoe

Length: 90 inches, width 25 inches  
weight 2100 pound (about 953Kg)

Chemical component: AISI 4320 (0.17-0.23C, 0.40-0.70 Mn, 0.15-0.30 Si, 0.35-0.65Cr, 1.55-2.00 Ni, 0.20-0.30 Mo and some others)



**Crawler Drive Unit** (NASA Photo)



Pattern for Top Half (Cope) of the Mold



Pattern for Bottom Half (Drag) of the Mold



2018/4/8 Sunday Track Shoe Casting



**NASA Crawler Transporter with Space Shuttle** (NASA Photo)

# Mining Machinery castings -bucket tooth

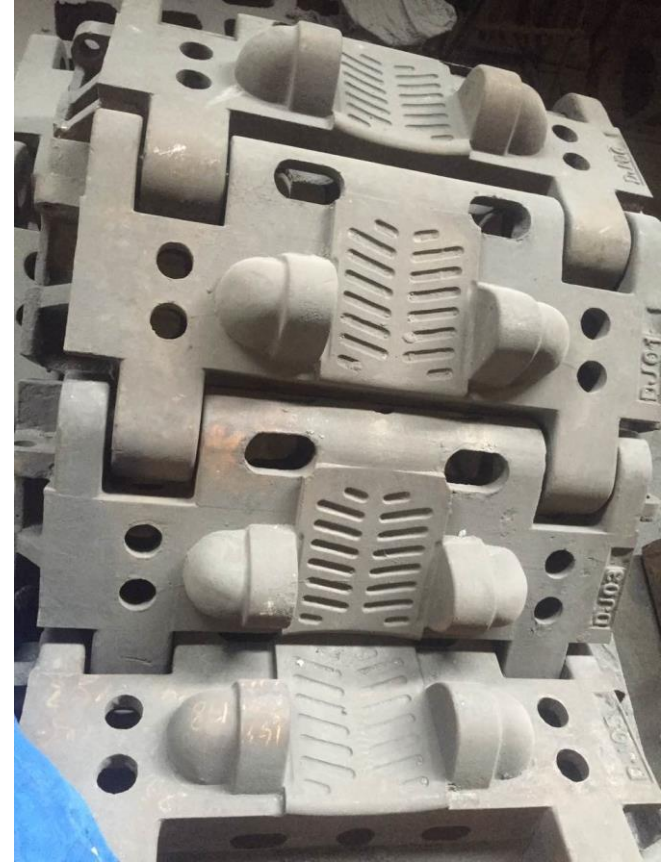


material:high maganese steel  
weight:over 200kg  
working condition:mining field





# Mining Machinery castings-bucket tooth



Electric shovel ZGMn13Cr2-3

weight:295kg

size:1052mmx441mmx260mm

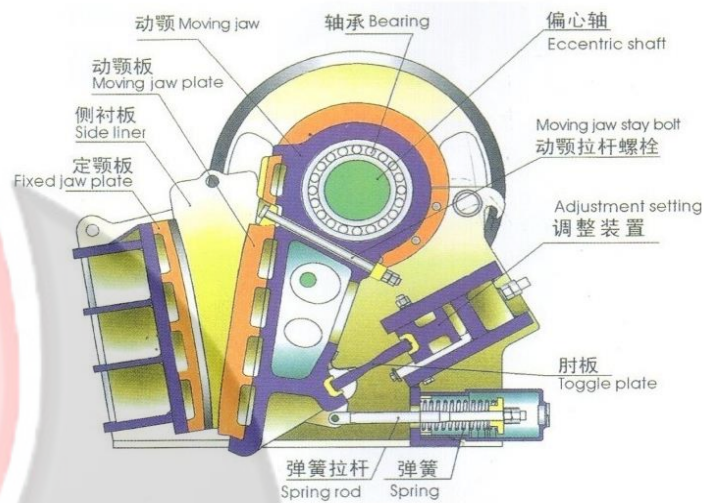
This track shoe is applied in mining shovel-trucks.



Track shoes are a kind of quick-wear chassis parts for construction machinery.

# Mining Machinery castings

## -jaw plate



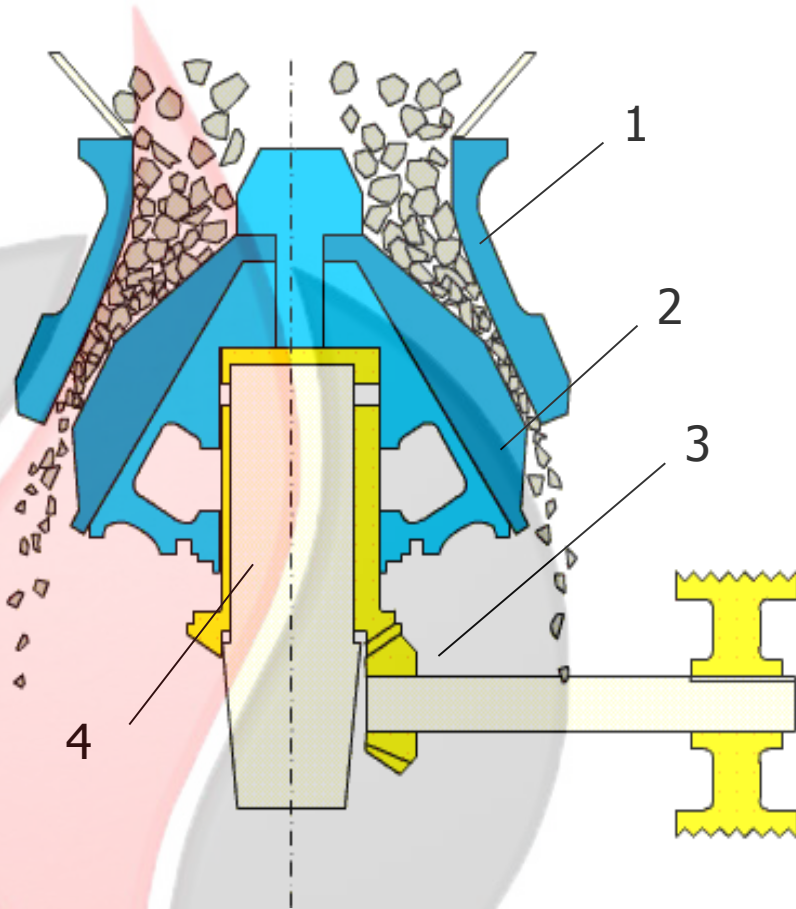
cooling procedure



casting after shaking out



# Mining Machinery castings-concave



working principle diagram

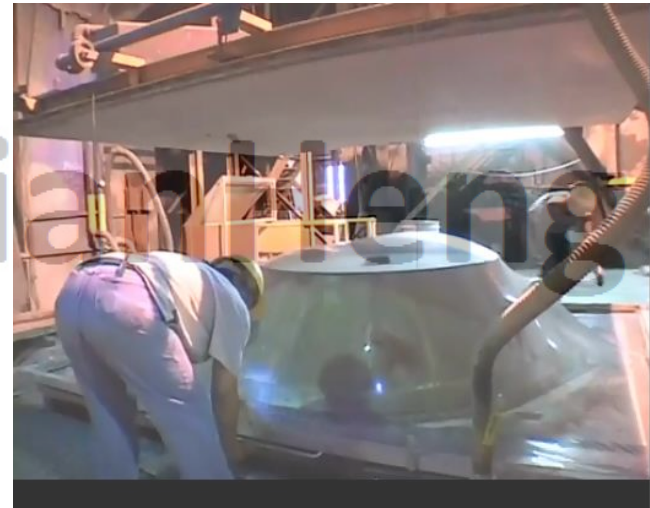
1-rolling mortar wall 2-crushing wall

3-transmission with cone pulley

4-eccentric swing mechanism



machined casting

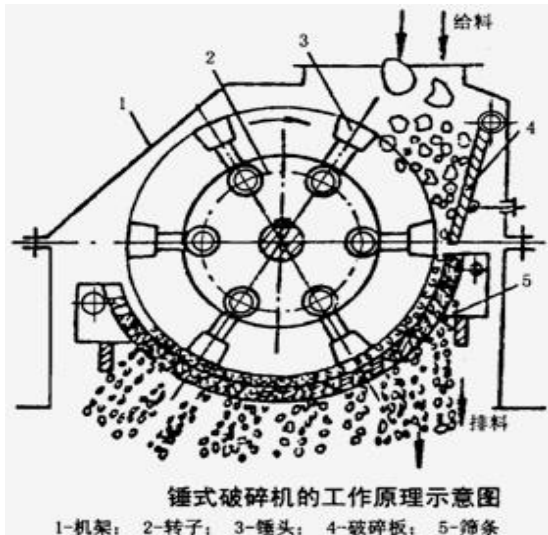


film covering procedure

# Mining Machinery castings-hammer



molding process



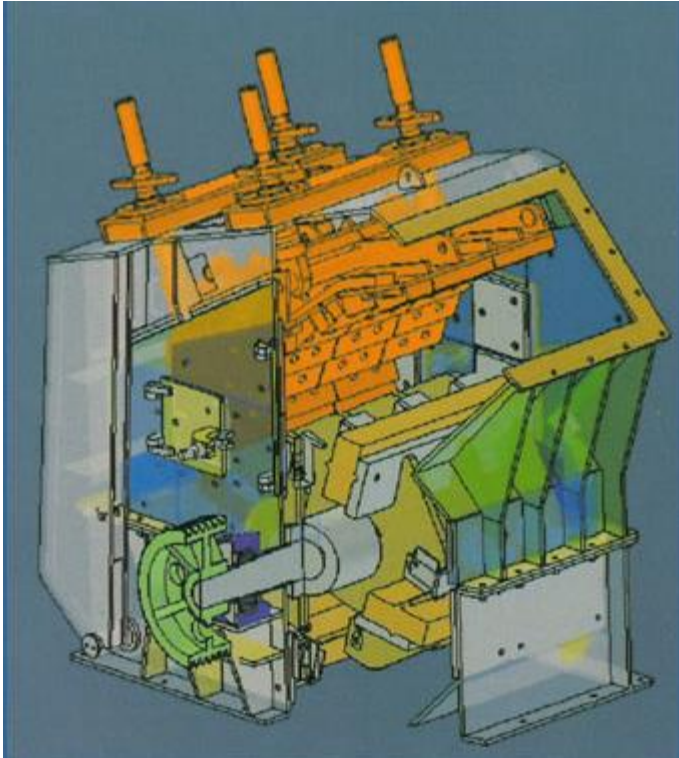
working theory



casting after shaking out



# Mining Machinery castings -flat hammer

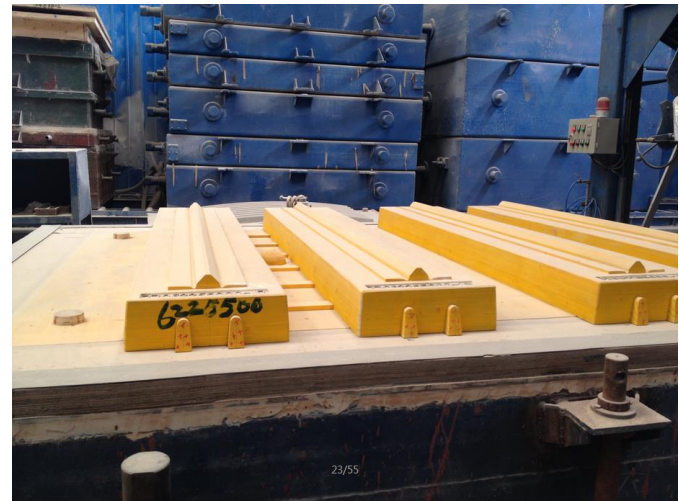


working theory

The shape of flat hammer is simple so it is easily formed by V-process molding;

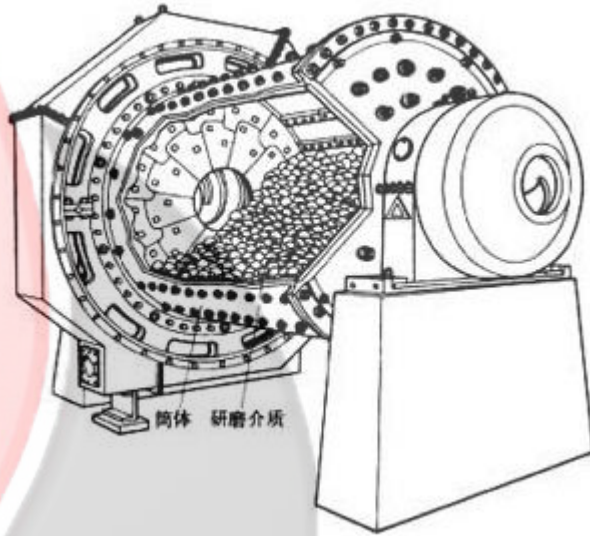


flat hammer casting



molding pattern

# Mining Machinery castings-liner plate



waiting pouring



different kinds of liner plate



# Heat treatment equipment parts-trays&basket



heat treatment trays casting  
because of the structure, it is difficult  
to cover the film. so we need good  
film and film heater, also should have  
long distance between casting and  
flask.

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up pattern after covering film



bottom pattern after covering film

# Heat treatment equipment parts

## -trays&basket

the castings shall bear frequent heating&cooling shock  
so the castings have high requirement on the materials and structure.  
such as the Japanese material standard SCH12、SCH13、SCH21、SCH24.



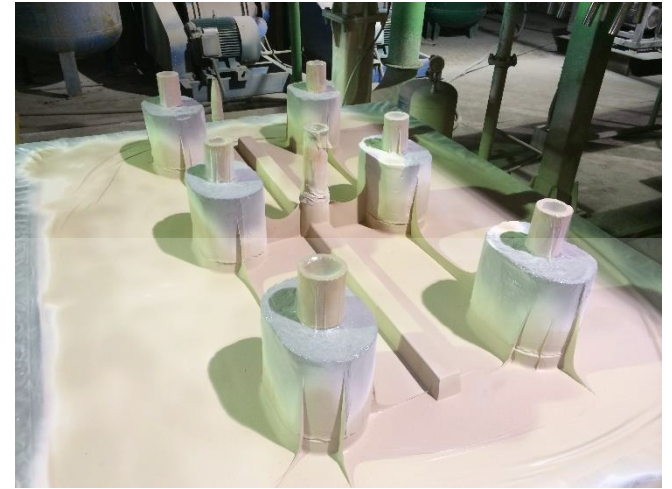
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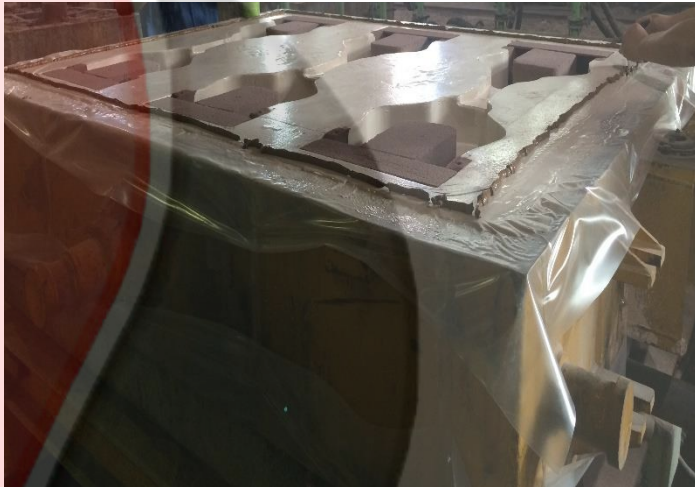
# Coal Mine Machinery-pillar nest casting



as-cast casting



cope mold molding

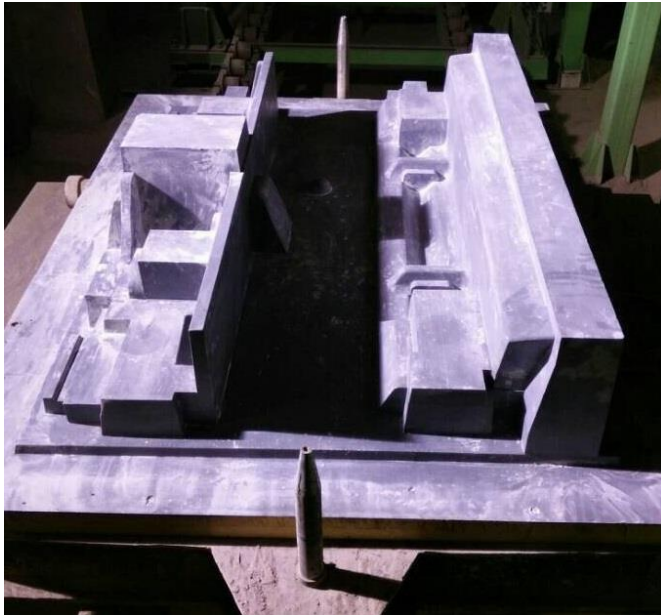


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core setting



drag mold molding

# Coal Mine Machinery-scraper blade



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pattern for molding



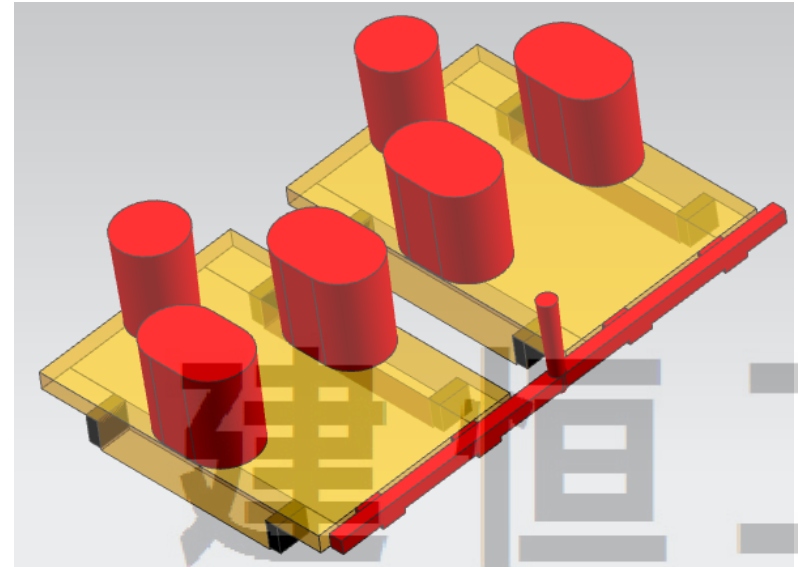
setting cores



# public construction -Bridge support



sets of bridge support



designing of gating system and chilling



casting after shaking out

# metallurgy field-mould



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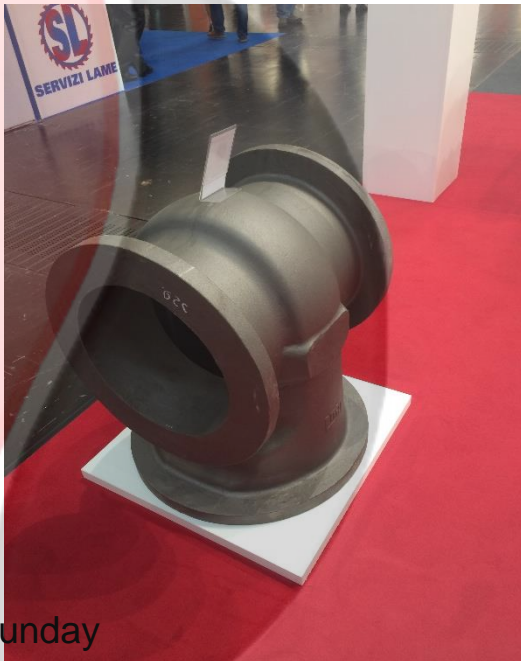


# metallurgy field-anode joint



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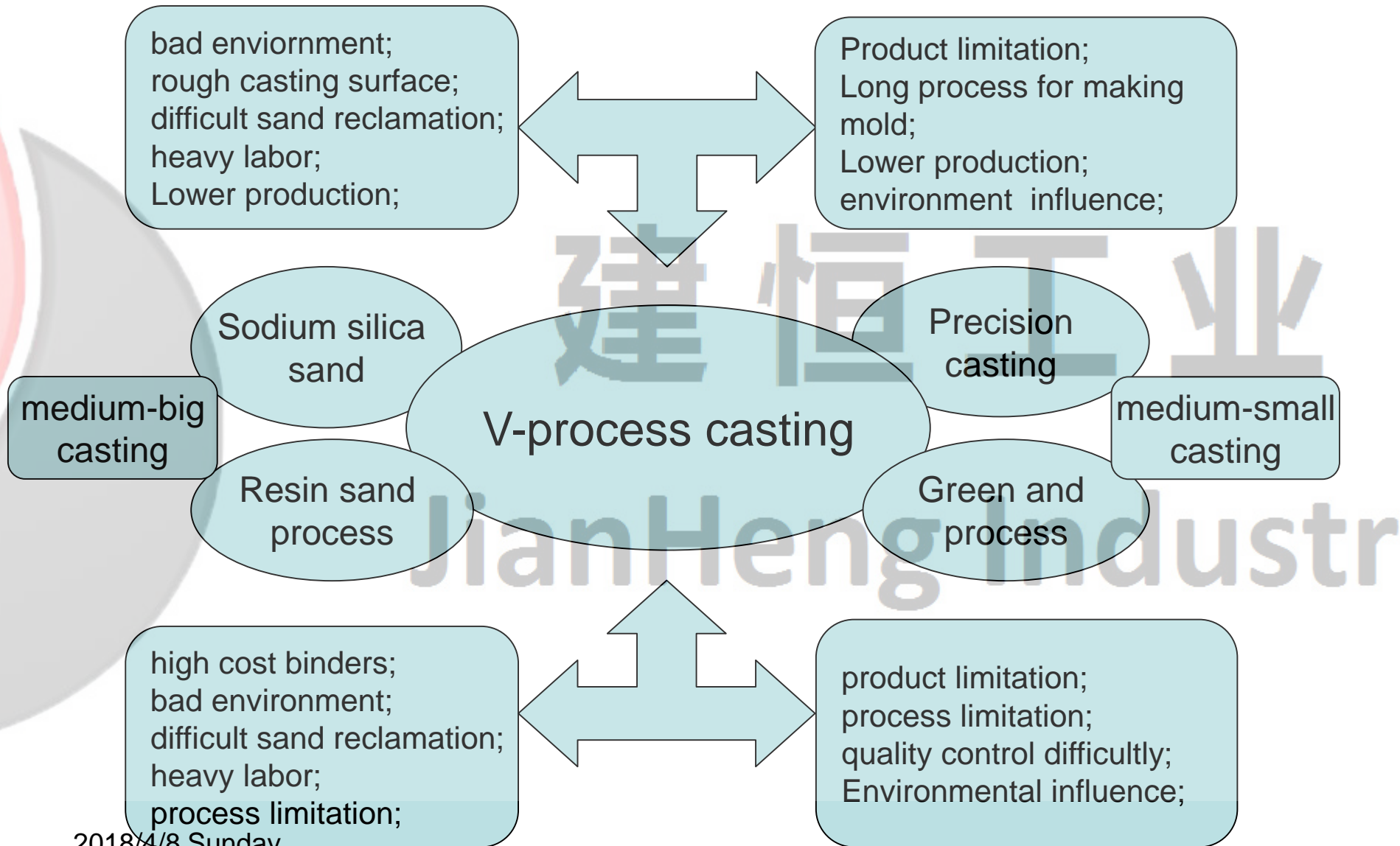
# valves industry-valve body castings



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# comparision among different casting method



# railway casting by different casting method

items	resin sand	green sand	water glass sand (CO <sub>2</sub> )	ester-hardening water glass	VRH process	V-process
requests for binder	high	high	high	high	common	none
mold strength	high	medium	high	medium	medium	medium
shaking out	easy	easy	difficulty	common	common	easiest
sand reclamation	simple	simple	simple	complicated	complicated	simplest
mold stability	good	common	common	common	common	good
surface quality	common	common	common	common	common	good
tear trend	high	low	low	low	low	low
molding cost	lower	lower	lower	low	lower	lowest
flexibility	good	better	better	better	better	common
environment influence	midium	lower	low	low	low	lower



# Reasons for Selection and Application

high quality—— good surface quality

low coarse improve tired life and assembling accuracy



if controlled well, V-process casting surface quality can be good as investment casting

# Reasons for Selection and Application

high quality—— less defects and low casting stress  
for thin wall cast steel casting with complicated structure



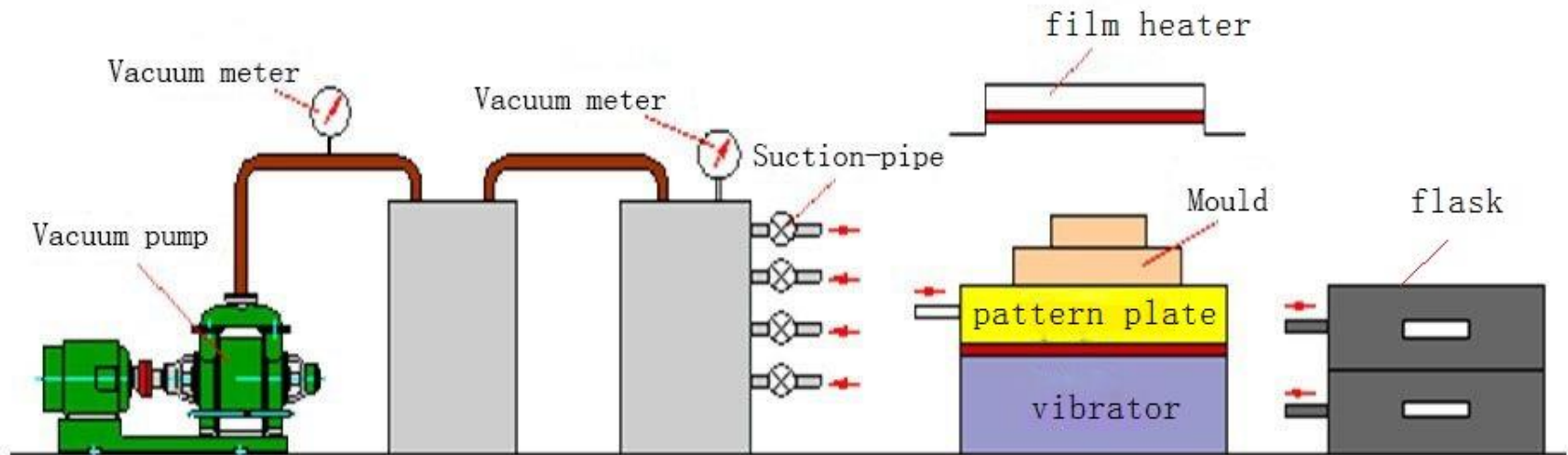
V-process casting offers better solution than resin sand and sodium silica sand comparing all factors for some castings;

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# Reasons for Selection and Application

low cost—request of market competition  
dry sand no binders ,sand circulation easily  
and little waste;  
low labour strength lead low labour cost;  
low wear make pattern cost low;  
low environmental cost



# Reasons for Selection and Application

environmental—request of modern industry

no harmful gas and wastes;

dust from dry sand and noise from vacuum pump are main pollution factors, but easily controlled;





# Reasons for Selection and Application

—low labour strength: molding relaxedly and shaking out easily;



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武汉建恒工业技术有限公司

Wuhan Jianheng industrial technology Co.,Ltd

## **Brief introduction:**

Wuhan Jianheng industrial technology Co.,Ltd is an integrated service company committed to the development of foundry industry. The company owns a team with professional knowledge and rich practical experience in casting technology and management, engaging a number of senior foundry experts as consultant; the company will strive to become a modern service industry enterprises focusing on foundry consulting, research, technology, production, supplyment, trade, human resources and other service .

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Wuhan Jianheng industrial technology Co.,Ltd

## Service scope:

1. V-Process casting process designing and optimization of castings;
2. Designing and manufacturing of V-Process patterns;
3. Analysis and solutions of casting quality problems;
4. Designing and selection of V-Process casting equipment ;
5. Evaluation and improvement of V-Process casting equipment;
6. Procedure instruction and operation guidance of V-Process casting production;
7. Production management and quality controlling of V-Process casting workshop;
- 8.Planning and designing of V-Process casting projects;
9. Guidance and supervising of V-Process casting projects;
10. Technical communication and personnel training of V-Process casting ;
11. Establishing ,optimization and improvement of V-Process production system.
12. Supplying of foundry assistant material on V-process casting production;
- 13.designing and optimization of casting structure and material;

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