LINER

CITIC IC
中实重机

CITIC IC LUOYANG HEAVY MACHINERY CO., LTD

BEST

B——Benefit
E——Efficiency
S——Standard
T——Technology

Liner Presentation

Liner

Liner is to protect shell from direct impact and frication of grinding materials and also used to modulate motion of grinding material. It could improve grinding efficiency and productivity, as well as reduce liner wear.

CITIC IC
中实重机

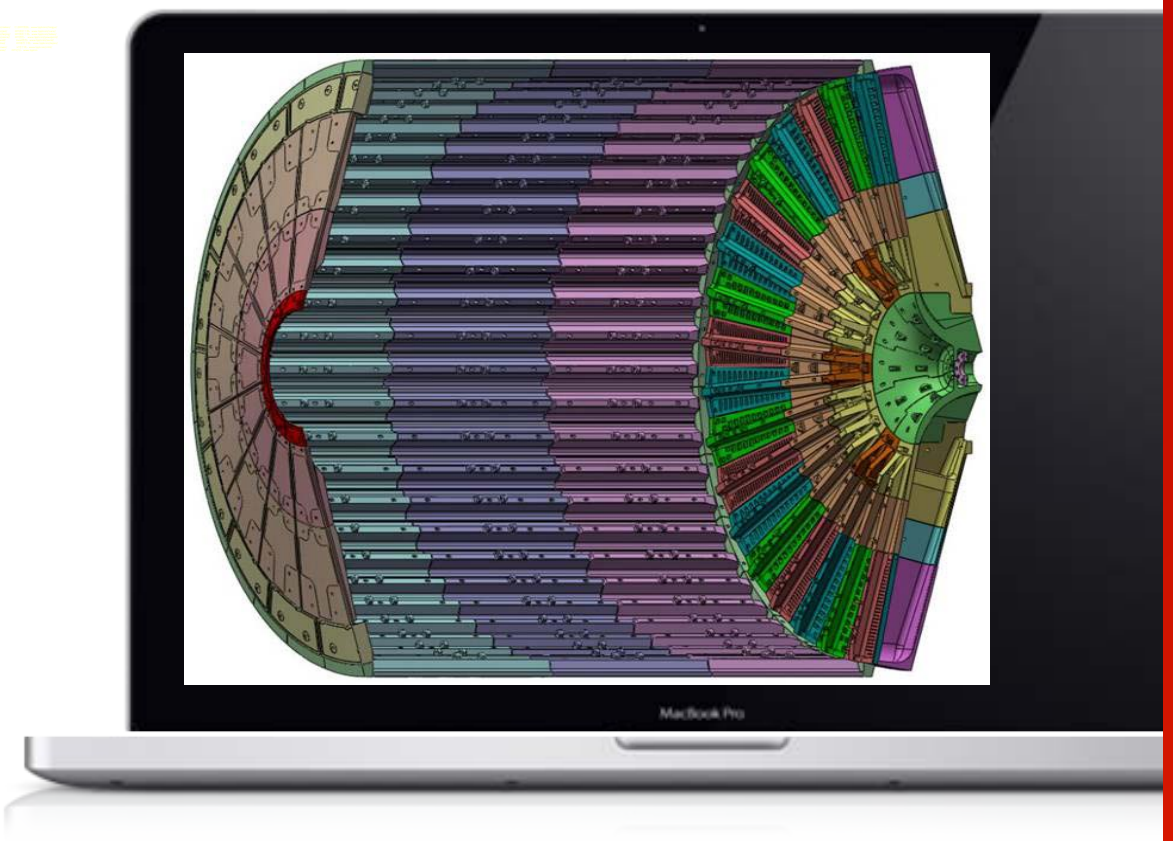
Our advantage：

1. Pre-sales design, After-sales process tracking & Improvement
2. Equipments and Matching system
3. Quality control & Inspection methods
4. Package & Delivery—Last mile is also essential
5. Cases—Design optimization
6. Service—With 64 years experience of industry service

01

Pre-sales design,
After-sales process tracking
& Improvement

Design



Software

1. Simulation casting software (MAGMA, Intecast CAE）
2. Discrete element Method (DEM)
3. Finite element Method (ANSYS)
4. 3D CAD (Solid Works)
   (assembly simulation, drawings& design check)

Design experience

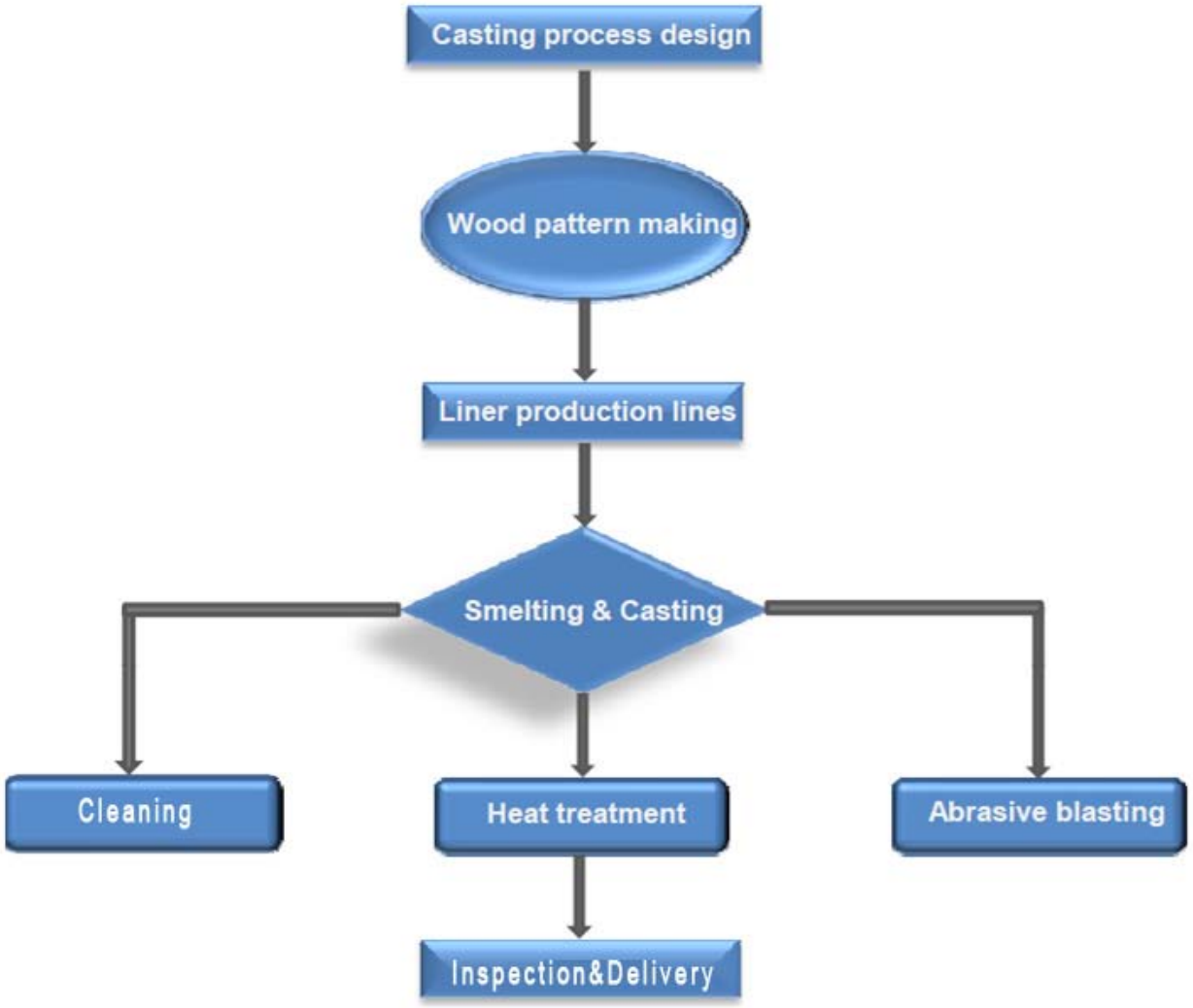
1. 64 years experience in mining machinery.
2. Various types of mill liners design & reform.
3. Ability to convert national and international standar
4. Life-cycle service conception & ability.

Purpose

Optimize material, Optimize structure, Optimize techn
Extend liner life, Improve efficiency, Lower cost.

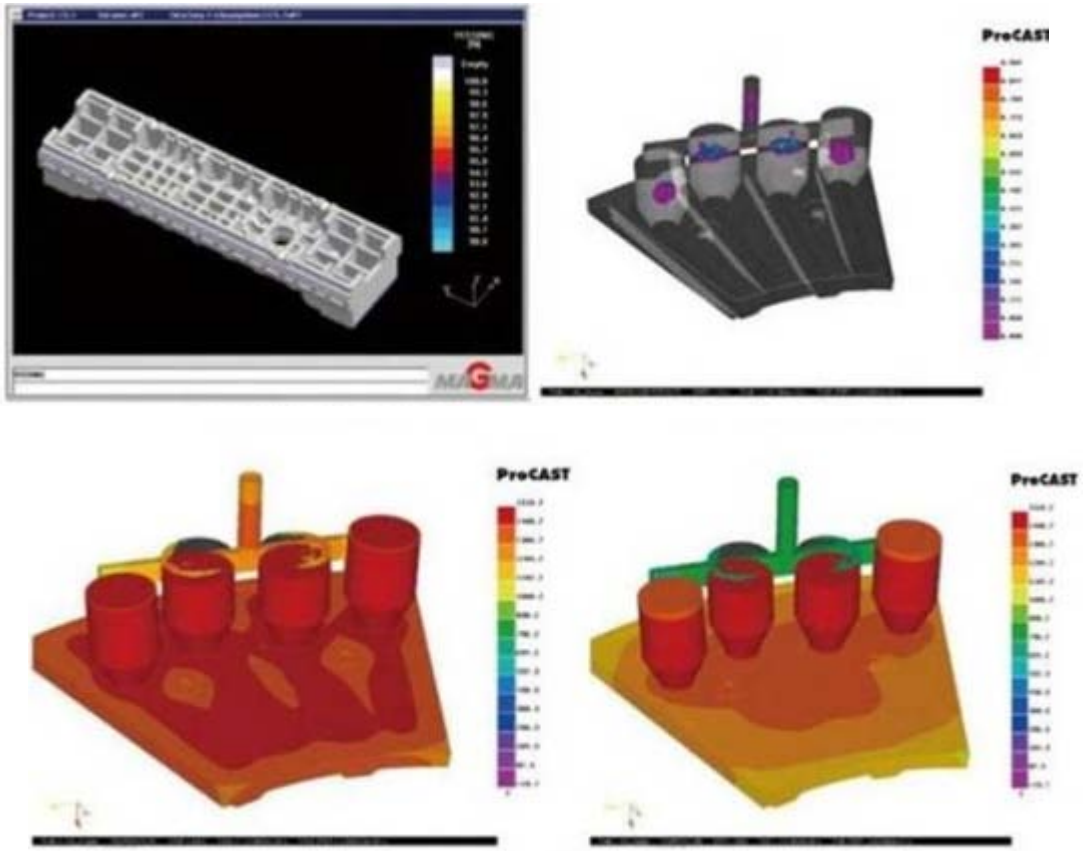
Production technics design

Production flowchart

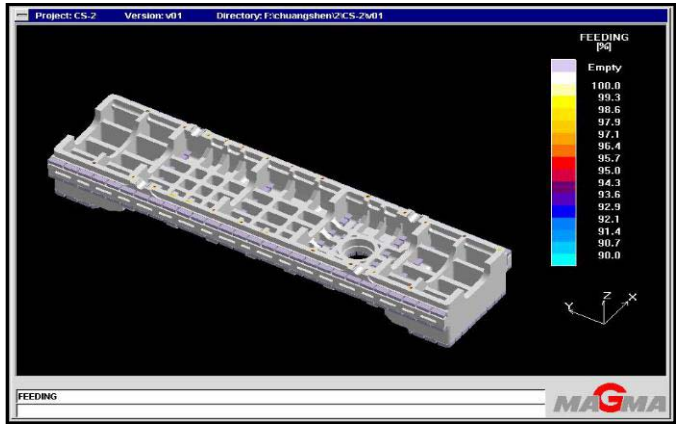


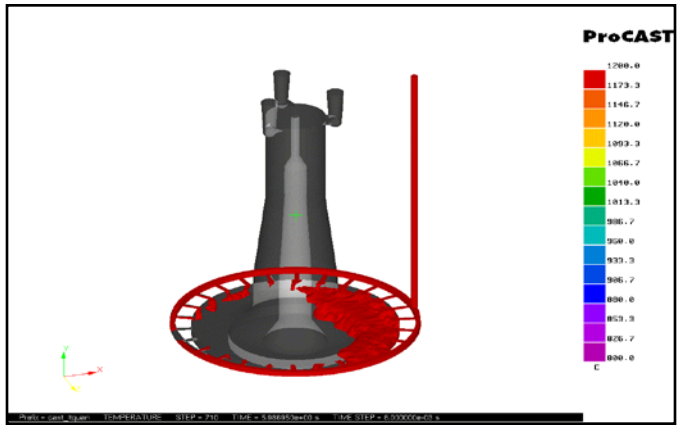
High-tech

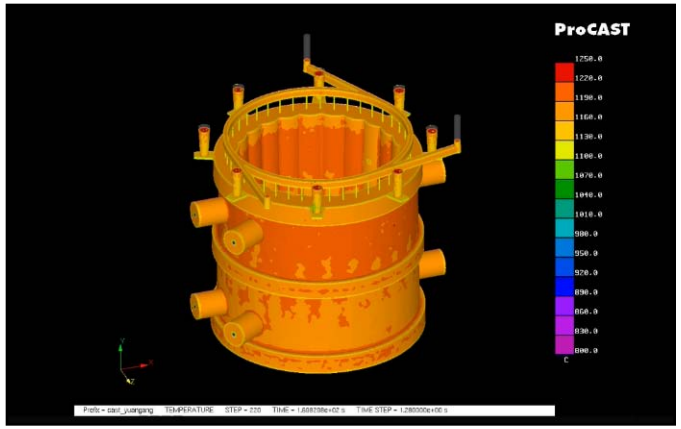
Adopting advanced software (material software, casting software, heat treatment software, etc.). These software could improve liner properties greatly.

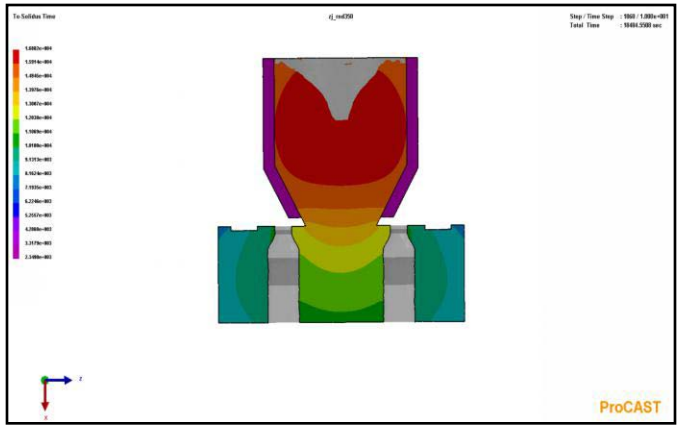


Production technics design



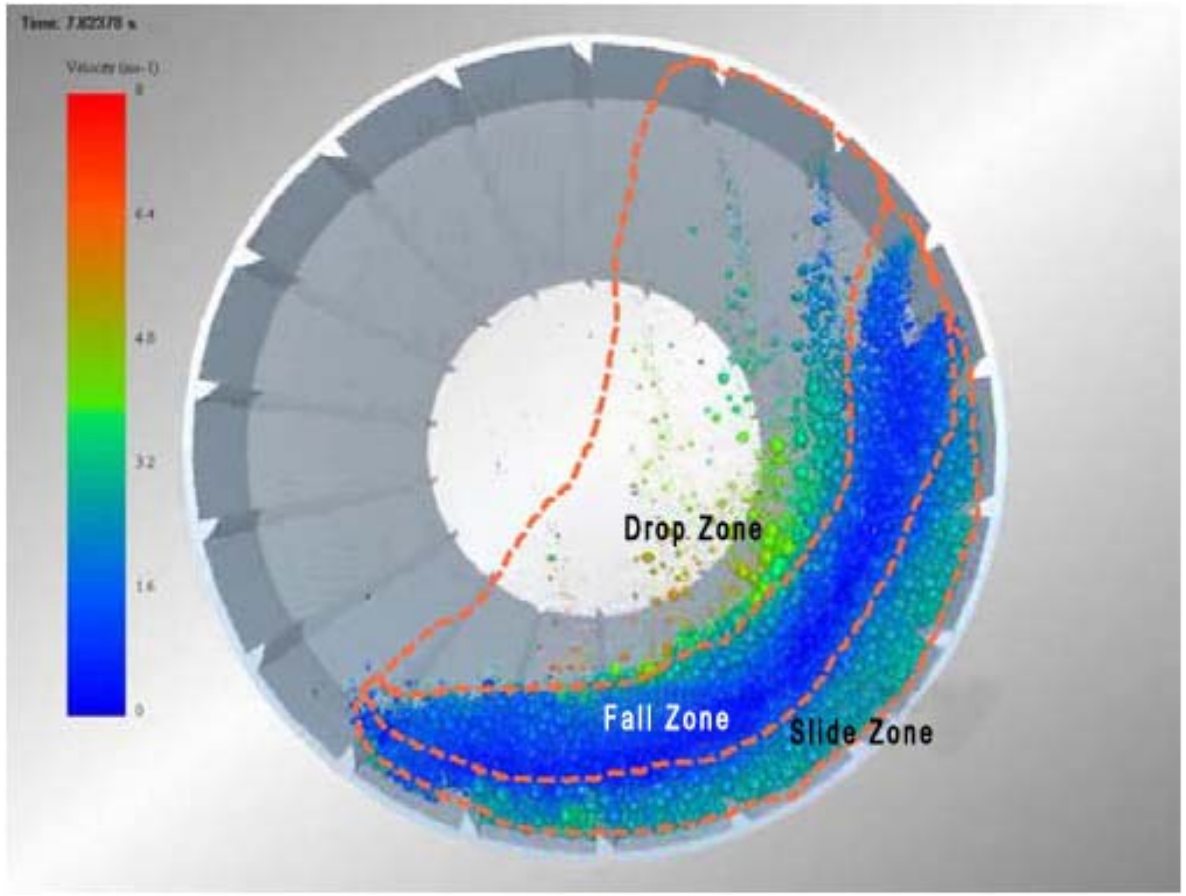






Liner optimization through multiple simulation of casting process.

Production technics design



Simulation of mill working condition

Reform & optimize

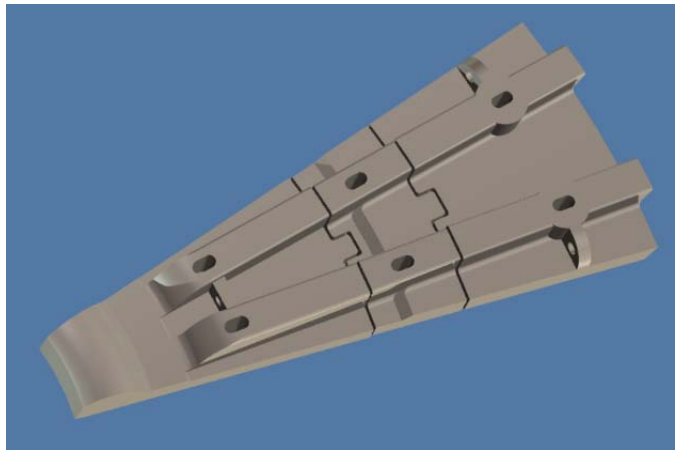
Poor Design :Liner Yield Deformation by Direct Smash of Balls Due

Reasonable Design: The plate of SAG gradually and evenly worn out

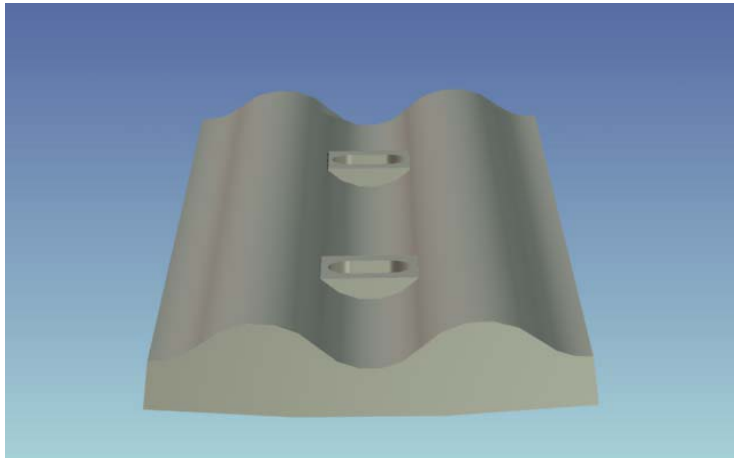
Poor Design : SAG liner’s fragmentation

Reasonable Design: The plate of SAG gradually and evenly worn out,and the shape does not change

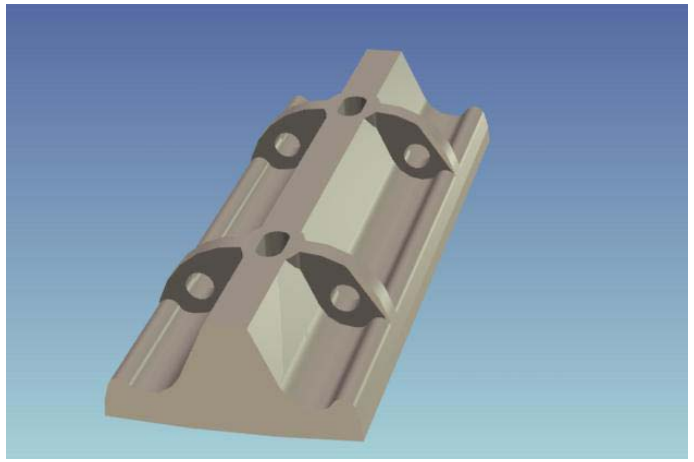
Reform & optimize



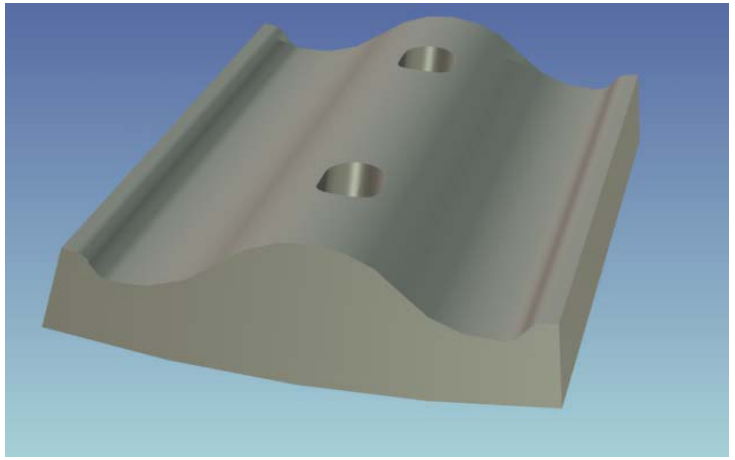
Segment design according to different abrasion degree



Double wave crest design of overflow mill liner



Trapezoidal design of liner to improve strength



Balance upstream design & downstream produce --- improve liner strength & mill efficiency by big data analysis

02 Equipments and Matching system

Production equipments

Equipments

* 5T, 12T, 30T smelting furnaces
* VRH molding line
* 2x5m Auto control gas heat treatment furnace
* 2x5m Auto control gas heat treatment furnace for tempering
* 1.3x1.6m Medium temperature electric heat treatment furnace
* 350T brine quenching pool
* 50T water-based quenching cooling system

Our production ability: molding, smelting, casting,sand cleaning, heat treatment, polishing and warehousing after quality inspection . DF-100 direct read-out spectrometer,MLD-10 dynamic load wear tester and other testing devices could test, comparation, analysis of physical and chemical property index and abrasion resistant index . Our annual production capacity of wear-resistant castings can reach 10000 tons.

Production equipments

Pattern

Modeling workshop

Medium-frequency induction furnaces

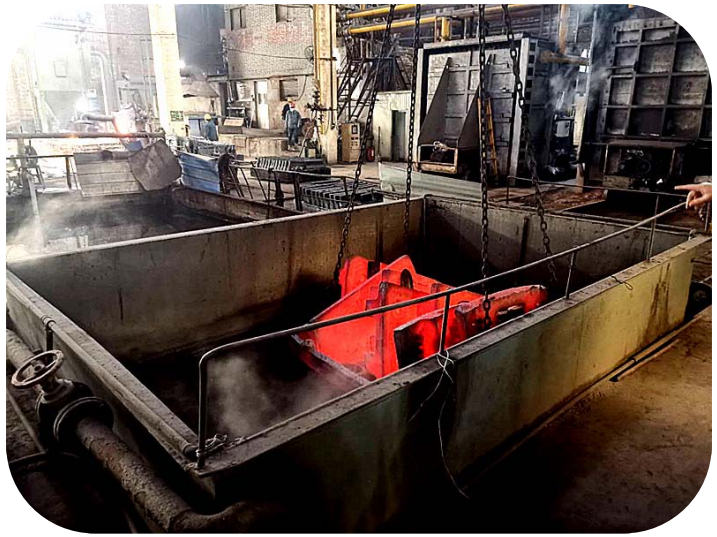
Mobile-Continuously sand mixer

Production equipments

VRH modeling line

2x5m Auto control heat treatment furnace

Casting line



Water-based quenching pool

Brine quenching pool

03 Quality control & Inspection methods

Quality Control

64 years experience accumulation and cultural heritage from Luoyang Mining Machinery Factory(CITIC nowadays)

Perfect equipment management experience

Complete Inspection standards —— before production- after production, test and report in all links of production, finished product quality acceptance.

Experience of QC and delivery to international famous companies.

Quality Control

1.Founded in 1956,Luoyang Mining Machinery Factory is one of the key enterprises in China’s first Five-Year plan, After 64 years reformation and development,we have made many excellent achievements in the design and manufacturing of heavy machinery and accumulated rich first-hand experience.

Quality Control

2.Complete manufacturing equipments, Periodic review and maintenance system, Stable manufacturing capacity.

Quality Control

3.Complete test standards:

Before Production: Molding Sand Test—Fuel Examination—IQC—Precious Metal Test

During production: Wood Pattern Inspection—Molding Test—Liquid Steel Test—Heat treatment Test—Visual Inspection—Hardness Test—Mechanical Properties Test

Quality Control

4. Experience of matching standards of international famous enterprises and Long-term relationship of cooperation.

CODELCO

metso

CITIC

HUMBOLDT WEDAG

SINOMA 中国中材

FLSmidth

Rio Tinto

Inspection

Sand detector

DF100 direct-reading spectrograph

Sand detector

Carbon sulfur analyzer

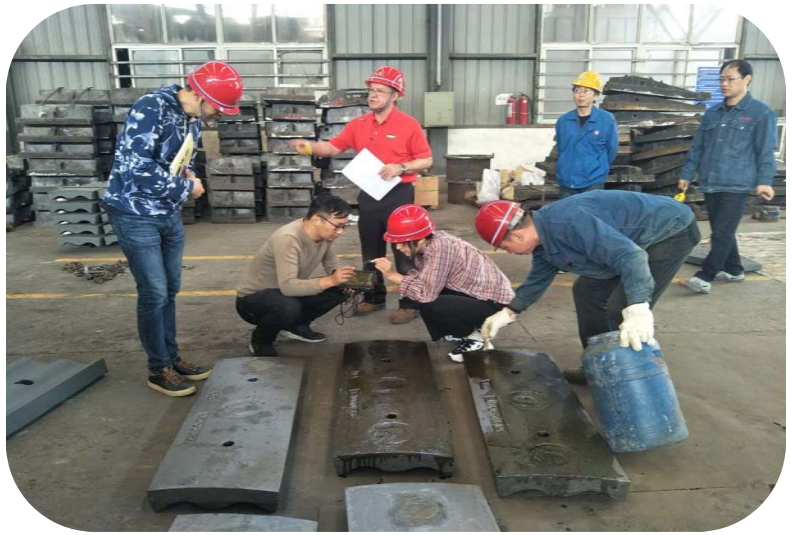
Inspection

Mechanical impact tester

IQC Instruments

Mechanical tensile tester

Inspection



Visual Inspection

Hardness test

Ultrasonic test

Dimension test

04 Package & Delivery—Last mile is also essential

Package& Delivery —Multimodal Transport

Package& Delivery

05 Case—Design optimization

Typical product

Φ9.75×4.57m SAG feed inlet liner

Φ3.2×11m Cement mill shell liner

Φ8.8×4.8m SAG Grid

Φ6.7×11.58m Ball mill shell liner

Typical product

Chromium-molybdenum alloy steel

Low carbon martensite alloy steel

Unique chemical composition, Super mechanical properties

Typical product

Trial Installment of mill liner

Case

CITIC IC

Improvement

LINER

Optimization scheme of mill linings for Turkey DAL Cement Engineering Company

Based on the data analysis of in-service raw material mill and cement mill liner, the material and structure design of liner are improved to solve the problem of fracture, enhance grinding efficiency and improve efficiency.

Russian Emperor Gold Mine liner optimization and improvement design scheme

By optimizing the structure and improving the material of the liner, the fracture problem was solved and the service life was extended by at least 3 months.

Tanzania LAKE Cement Company liner optimization and improvement design scheme

The material and structure was changed the service life was extended through the mapping and analysis of the original liner.

Case

On-site

LINER

Tanzania 3.6×15m cement mill liner Surveying & mapping

Case

On-site

LINER

Case

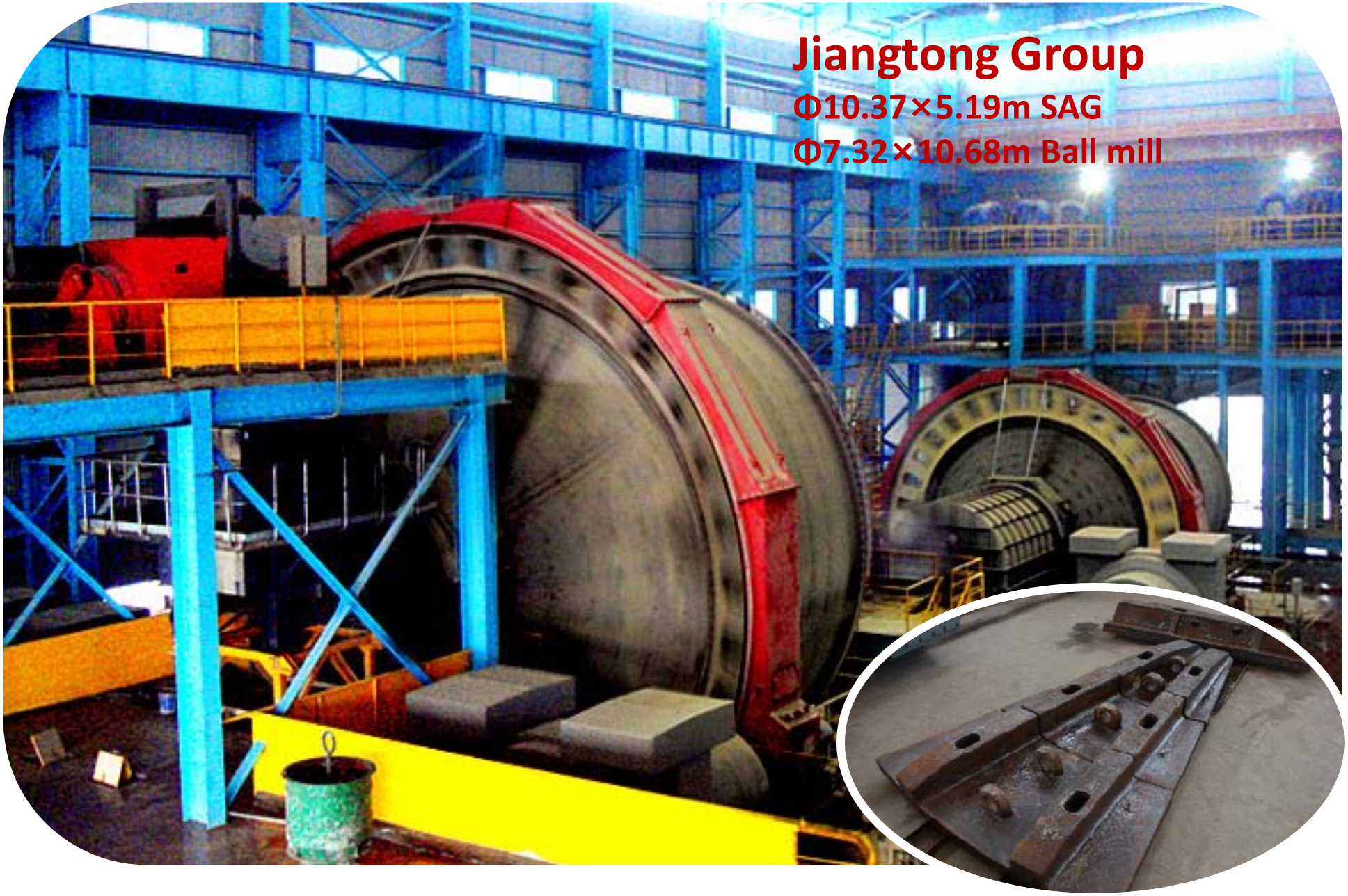
On-site

LINER

Case

On-site

LINER

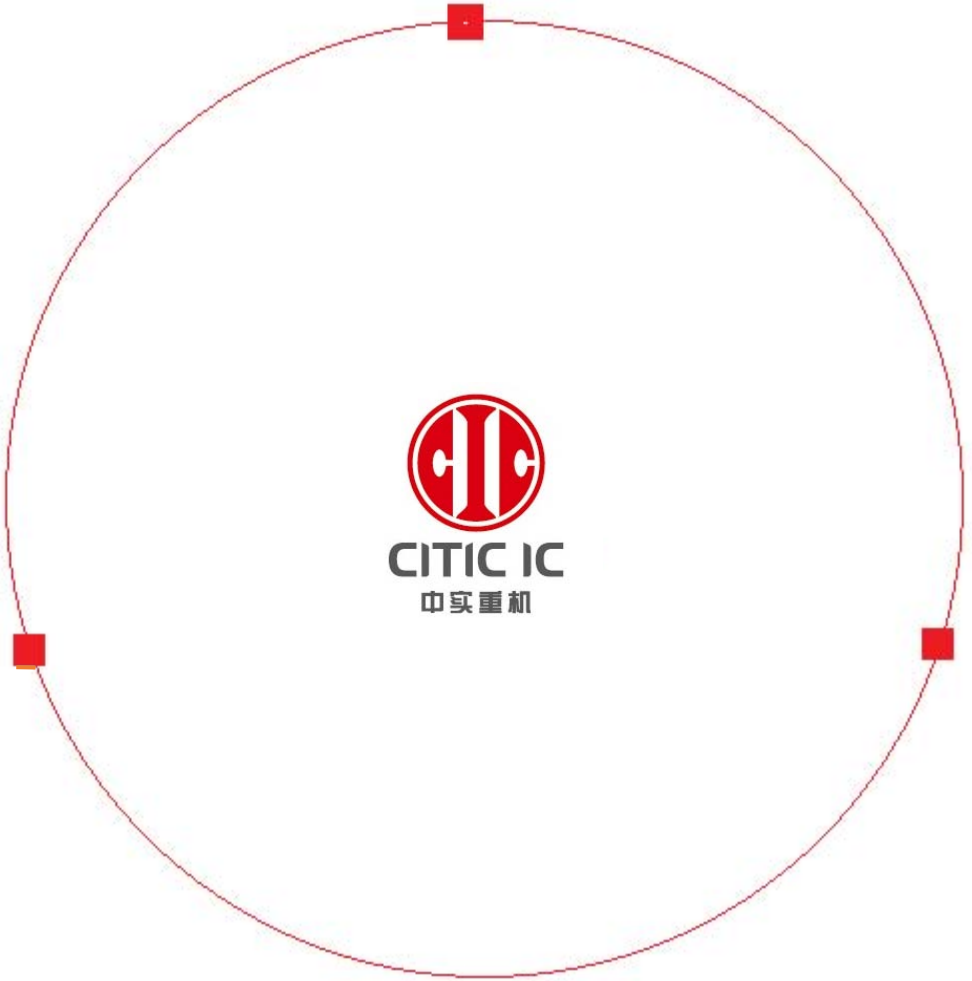


06

Service—With 64 years service of industry service

Service

1.Full supply chain service: Design-Test-Production-Optimization-QC-Package-Delivery-After-sales maintenance.



2.Rich experience: cooperate with famous corporations at home and abroad for 64 years.

3. Vision: Made in CIC, trustworthy—win-win, efficient and pragmatic,
we will not discount for the sake of dreams.

Please Contact Us:

Tel: +86 379 6408 6155
Mobile: +86 135 9201 7380
Email: johnson.ji@cichmc.com

CITIC IC
中实重机