



中国十五冶
15MCC



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中国十五冶金建设集团有限公司 矿山业务

China 15th Metallurgical Construction Group Co., Ltd.
Mining business



中国十五冶金建设集团有限公司

China 15th Metallurgical Construction Group Co., Ltd.

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打造成为行业领先的矿山综合服务商

BECOMING AN INDUSTRY-LEADING COMPREHENSIVE MINE SERVICE PROVIDER

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企业篇 ABOUT US



COMPANY MINING PROFILE

公司矿山业务简介

中国十五冶金建设集团有限公司（简称“中国十五冶”）成立于1953年，是中国有色矿业集团有限公司的全资子公司，下设35家分子公司。拥有冶金施工总承包特级资质；冶金行业、建筑行业（建筑工程）工程设计双甲资质；矿山工程、建筑工程、石油化工工程、机电安装工程、市政工程、电力工程、公路工程7项施工总承包壹级资质；隧道工程、地基基础工程、起重设备安装工程等21项专业承包资质；营业性爆破资质；对外经济合作经营资格。在30多个国家和地区设计、建设1000多个工程项目，荣获鲁班奖12项、国家级优质工程奖等工程奖项300多项，获得全国五一劳动奖状、全国优秀施工企业等企业奖项。荣登2023年度中国对外承包工程百强企业第71名，2024年度美国《工程新闻纪录》(ENR)国际承包商第111位、全球承包商250强第235位，2023年ESG报告在金蜜蜂智库评定为A级(优秀)。

矿山业务是中国十五冶传统优势业务，拥有地质、测量、井建、采矿、选矿、尾矿等矿山专业工程师200余人，服务范围涵盖铜钴、铅锌、镍、稀贵金属、铁、稀土等细分领域，承建有色、冶金、煤炭、黄金等矿山工程160余项，荣获鲁班奖5项、国家优质工程奖9项、省部级奖项29项。

公司在矿山行业不断创造着国内和海外纪录。建成了国内首座250t/d钨选矿（瑶岗仙钨矿），最大的露天铜矿（德兴铜矿三期，130000t/d），我国“十一五”期间海外投资重点项目（缅甸达贡山镍矿），我国海外投资最大的尾矿库（吉尔吉斯左岸金矿浮选尾矿库），亚洲最大尾矿库（江铜德兴铜矿五号尾矿库，库容量10亿m³），非洲第一座数字化矿山（赞比亚谦比希铜矿东南矿区），国内第二大稀土矿山（中国稀土四川牦牛坪稀土矿）；安装了国内首个大型半自磨机（冬瓜山铜矿）、亚洲高差最大皮带廊（缅甸达贡山镍矿）；创造了全国冶金系统竖井施工记录（金山店铁矿）、半自磨机和溢流型球磨机国内最大规格安装新纪录（乌努格吐山铜钼矿）；千米以上竖井矿山开采（恒邦辽上金矿，掘进深度1200m）；首次采用TBM进行地下矿山平巷掘进（江铜银珠山矿）。

Founded in 1953, China 15th Metallurgical Construction Group Co., Ltd. (hereinafter referred to as "15MCC") is a wholly-owned subsidiary of China Nonferrous Metal Mining (Group) Co., Ltd. It has 35 branches and subsidiaries, and has special-grade qualification for general contracting of metallurgical construction; double Grade A qualifications for engineering design in metallurgical industry and construction industry (construction engineering); 7 Grade I qualifications for general contracting of mine engineering, construction engineering, petrochemical engineering, mechanical and electrical installation engineering, municipal engineering, electric power engineering, and highway engineering; 21 specialized contracting qualifications for tunnel engineering, foundation engineering, and lifting equipment installation engineering; and foreign economic cooperation and operation qualifications. 15MCC has designed and constructed over 1,000 projects in more than 30 countries and regions, and has won 12 Luban Prizes, over 300 engineering awards such as the National High Quality Engineering Award. It has also received awards such as the National May Day Labor Award and the National Excellent Construction Enterprise. It ranks 71st among China's top 100 Foreign Contractors in 2023, 111th among international contractors and 235th among the Top 250 global contractors in the Engineering News Record (ENR) in 2024, and is rated as A (excellent) in the ESG Report in 2023 by the Golden Bee Think Tank.

Mining business is 15MCC's longstanding core business, supported by a team of over 200 specialized mine engineers in geology, surveying, well construction, mining, mineral processing, and tailings. 15MCC offers services across various segments including copper-cobalt, lead-zinc, nickel, rare and precious metals, iron, and rare earth. It has undertaken over 160 mine projects involving non-ferrous metals, metallurgy, coal, and gold, earning 5 Luban Prizes, 9 National Quality Project Awards, and 29 provincial and ministerial awards.

15MCC continues to set domestic and overseas records in the mining industry. It has constructed China's first 250 t/d tungsten processing mine (Yaogangxian Tungsten Mine), China's largest open-pit copper mine (Dexing Copper Mine Phase III, 130,000 t/d), a key overseas investment project during the 11th Five-year Plan of China (Tagaung Taung Nickel Mine in Myanmar), the largest TSF in China's overseas investment (Flotation TSF of Levoberzhny Gold Mine in Kyrgyzstan), the largest TSF in Asia (5# TSF in Dexing Copper Mine of Jiangxi Copper Corporation, with a storage capacity of 1 billion m³), the first digital mine in Africa (Southeast Mining Area of Zambia Chambishi Copper Mine), and China's second largest rare earth mine (Sichuan Maoniuping Rare Earth Mine of China Rare Earth Group). It has installed China's first large-scale SAG mill (Dongguashan Copper Mine) and the belt gallery with the largest altitude difference in Asia (Tagaung Taung Nickel Mine in Myanmar). It has set the records for China's metallurgical system shaft construction (Jinshandian Iron Mine) and China's largest SAG mill and overflow ball mill installation (Unuge Tushan Copper-Molybdenum Mine). It has realized the mining by using a shaft longer than 1,000m (Liaoshang Gold Mine of Shandong Humon Smelting Co., Ltd., with an excavating depth of 1,200m). It is the first to introduce the TBM to perform the drift excavation of underground mine (Jiangxi Copper Yinzhusan Mine).

中国十五冶从事矿山业务的全资子公司主要有沈阳有色冶金设计研究院有限公司（简称“沈阳设计院”）、湖北中色矿山工程技术有限公司（简称“中色矿山”）、十五冶对外工程有限公司（简称“对外公司”）、十五冶非洲建筑贸易有限公司（以下简称“非洲公司”）。

沈阳设计院成立于1953年12月，拥有双甲级资质：冶金行业甲级设计资质、建筑行业（建筑工程）专业甲级设计资质。完成国内外矿山工程设计、冶炼工程设计、发电工程设计、民用工程设计2500余项，拥有发明专利2项、实用新型专利20余项，获国家、省部级设计咨询奖项70余项，省部级科技进步奖2项。

中色矿山前身成立于1963年，拥有矿山工程施工总承包壹级资质。在10多个国家和地区参建了200多个工程项目，先后高质量建成了有色、冶金、黄金、煤炭等近百个厂矿，其中大中型矿山42座，大型地下硐室60余个。完成科研成果40多项，荣获国家科技进步奖3项，省部级奖项5项。

对外公司成立于2008年，拥有矿山工程施工总承包壹级资质。先后在刚果（金）、安哥拉、苏丹、利比亚、沙特阿拉伯、哈萨克斯坦、塔吉克斯坦、吉尔吉斯斯坦、喀麦隆、印度尼西亚、外蒙、俄罗斯、加纳13个国家承建了大小海外项目62个，荣获境外工程鲁班奖2项，国家优质工程奖3项，省部级奖项18项。

非洲公司成立于2007年，为中国十五冶在赞比亚注册的全资子公司，拥有赞比亚国家建设委员会注册的矿业开采工程、房屋建筑工程、设备安装工程等6项最高一级资质。先后承接了7个露天矿区，年采剥离总量2000余万吨，采矿量610万吨。

踏上新征程，中国十五冶发挥矿山设计、建设、采矿传统业务优势，围绕“地、测、采、选、尾、修、数”，提供矿山全生命周期、全产业链综合服务，致力于打造成为行业领先的矿山综合服务商，助力矿山企业建成“绿色、智能、安全、高效”的现代化矿山，以一流的质量、一流的速度、一流的管理、一流的服务实现对客户的承诺，为客户创造最大的价值。

The wholly-owned subsidiaries of 15MCC engaged in the mining business mainly include Shenyang Nonferrous Metallurgy Design Institute Co., Ltd. (Shenyang Design Institute), Hubei Zhongse Mining Technology Co., Ltd. (Zhongse), 15MCC International Engineering Co., Ltd. (15MCC International), and 15MCC Africa Construction and Trade Limited (15MCC Africa).

Founded in December 1953, Shenyang Design Institute owns Class A design qualifications in both metallurgy industry and construction industry (construction engineering). It has successfully completed over 2,500 designs in the fields of mine engineering, smelting engineering, power generation engineering, and civil engineering both domestically and internationally. Additionally, it holds 2 patents for invention and over 20 patents for utility models. The institute has been recognized with over 70 design consulting awards at national, provincial and ministerial levels, as well as 2 science and technology progress awards at provincial and ministerial levels.

With its predecessor founded in 1963, Zhongse owns Grade I general contracting qualification for mine engineering construction. Zhongse has been involved in over 200 projects across more than 10 countries and regions. It has successfully constructed nearly 100 high-quality factories and mines in nonferrous metals, metallurgy, gold, coal, and other sectors, including 42 large and medium-sized mines, along with over 60 large underground chambers. In the meantime, Zhongse has made more than 40 achievements in scientific research, earning 3 National Awards for Science and Technology Progress and 5 provincial and ministerial awards.

15MCC International, established in 2008, owns Grade I general contracting qualification for mine engineering construction. The Company has successively undertaken 62 projects in 13 countries, including the Democratic Republic of the Congo, Angola, Sudan, Libya, Saudi Arabia, Kazakhstan, Tajikistan, Kyrgyzstan, Cameroon, Indonesia, Mongolia, Russia, and Ghana, earning 2 Luban Prizes for overseas projects, 3 National Quality Project Awards and 18 provincial and ministerial awards.

Founded in 2007, 15MCC Africa is a wholly-owned subsidiary of 15MCC registered in Zambia. It holds six top-tier qualifications in fields including mining engineering, housing construction engineering and equipment installation engineering, all certified by the Zambia National Building Society. It has successively undertaken 7 open-pit mines, with an annual mining and stripping amount of more than 20 million tons and a total mining output of 6.1 million tons.

Embarking on a new journey, 15MCC exploits its advantages in traditional businesses such as mine design, construction, and mining to provide comprehensive services throughout the life cycle of mines and the whole industrial chain around “geology, surveying, mining, mineral processing, tailings, repair, and digitalization”. It is committed to becoming an industry-leading integrated mine service provider, helping mining enterprises build modern mines that are “green, intelligent, safe, and efficient”, fulfilling its commitments to customers with first-class quality, speed, management, and services, and creating maximum value for customers.

MINING BUSINESS RELATED QUALIFICATIONS

矿山业务相关资质

设计咨询 Design Consulting

冶金行业设计·甲级
Grade A Qualification for Design in Metallurgical Industry

建筑行业(建筑工程)设计·甲级
Grade A Qualification for Design in Construction Industry (Construction Engineering)

地质灾害评估和治理工程设计·乙级
Grade B Qualification for Design in Geological Disaster Assessment and Control Engineering

冶金(含钢铁、有色)工程咨询·乙级
Grade B Qualification for Consulting in Metallurgica (including Steel and Nonferrous) Engineering

施工总承包 General Construction Contracting

冶金工程·特级
Special Grade Qualification for Metallurgical Engineering

矿山工程·壹级
Grade I Qualification for Mine Engineering

机电工程·壹级
Grade I Qualification for Electromechanical Engineering

建筑工程·壹级
Grade I Qualification for Construction Engineering

专业施工 Professional Construction

环保工程·壹级
Grade I Qualification for Environmental Protection Engineering

钢结构工程·壹级
Grade I Qualification for Steel Structure Engineering

地基基础工程·壹级
Grade I Qualification for Foundation Engineering

消防设施工程·壹级
Grade I Qualification for Fire Facilities Engineering

测绘资质 Survey & Mapping

工程测量·乙级
Grade B Qualification for Engineering Survey



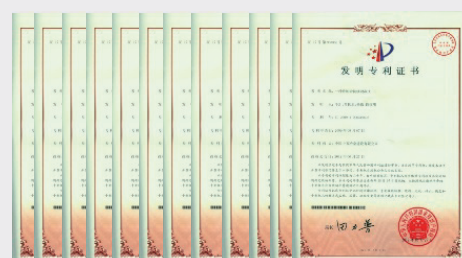
CERTIFICATES AND HONORS

荣誉证书

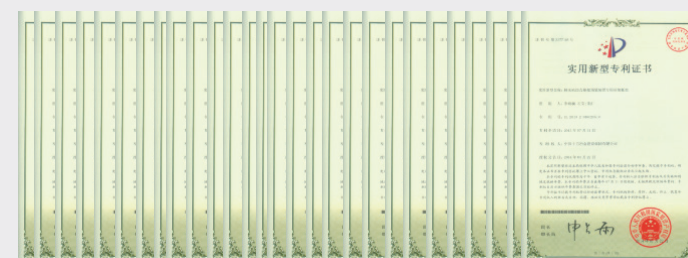


中国建设工程鲁班奖12项
China Construction Engineering Luban Prize 12 items

国家优质工程奖48项
National quality project awards 48 items



发明专利 (13项)
Invention patents (13)



实用新型专利 (106项)
Utility model patents (106)



MINE DESIGN

矿山设计

中国十五冶提供矿山采、选、冶和尾矿工程设计咨询业务，承担矿山类全过程设计的国外项目13项，国内项目18项。初步形成了国内国外双发展格局，国内工程设计以东北三省和内蒙古为中心，辐射云南、青海、天津、山东等20多个省市，国外工程设计主要在赞比亚、刚果（金）、蒙古国、孟加拉国、泰国等10余个国家和地区。

15MCC provides design consulting services for mining, processing, smelting, and tailings works. It has undertaken the whole process design of mines for 13 foreign projects and 18 domestic projects. It has preliminarily formed a "domestic + foreign" development pattern. Its domestic engineering design is centered on the three provinces in northeast China and Inner Mongolia, and expands to 20 provinces and municipalities directly under the Central Government such as Yunnan, Qinghai, Tianjin, and Shandong. Its foreign engineering design is mainly for more than 10 countries and regions such as Zambia, Democratic Republic of Congo (DRC), Mongolia, Bangladesh, and Thailand.

● 刚果（金）Kambove铜矿

DRC KAMBOVE COPPER MINE PROJECT OF KAMBOVE MINING SAS(COPPER)



- 该工程集采、选、冶和尾矿设计为一体，生产能力为 99 万 t/a
- 荣获 2020 年度有色金属建设行业（部级）优秀工程咨询成果一等奖
- 2020 年度辽宁省工程咨询协会优秀工程咨询成果三等奖
- 2022 年度有色金属建设行业优秀工程设计二等奖

- 15MCC designed the mining, processing, smelting, and tailings systems of this project, with a production capacity of 990,000 t/a
- It won the First Prize for Excellent Engineering Consulting Achievement in the Nonferrous Metals Construction Industry for 2020 (ministerial level)
- It won the Third Prize for Excellent Engineering Consulting Achievement for 2020 of Liaoning Association of Engineering Consulting
- It won the Second Prize for Excellent Engineering Design in Nonferrous Metals Construction Industry for 2022

● 赞比亚谦比希铜矿东南矿区

SOUTHEAST MINING AREA OF ZAMBIA CHAMBISHI COPPER MINE OF NFC AFRICA MINING PLC

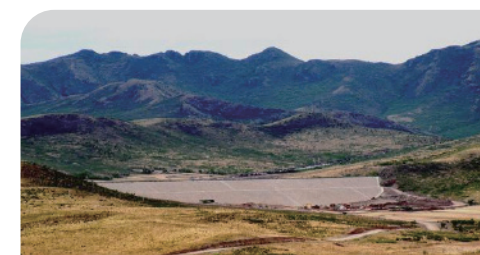


- 该工程为采选尾设计项目，本项目年产铜精矿 23.265 万 t/a
- 荣获 2020 年度“有色金属建设行业（部级）优秀工程设计成果一等奖
- “赞比亚谦比希铜矿东南矿区探建结合项目”获 2020 年度中国建设工程（境外工程）“鲁班奖”，实现了项目建设勘察、设计、施工全过程奖项“大满贯”

- 15MCC designed the mining, processing, and tailings systems of this project with the annual output of copper concentrates being 232,650 t/a
- It won the First Prize for Excellent Engineering Design Achievement in the Nonferrous Metals Construction Industry for 2020 (ministerial level)
- Combined Exploration and Construction Project of South-east Mining Area of Zambia Chambishi Copper Mine won China Construction Engineering Luban Prize (Overseas Project) for 2020, making it a project winning all the awards in project survey, design, and construction

● 赤峰敖伦花钼铜矿

CHIFENG AOLUNHUA MOLYBDENUM-COPPER MINE



- 该工程为采选尾设计项目
- 探明铜钼矿石储量 1.4 亿吨，铜、钼金属储量 10 万吨，属中大型矿山
- 矿山采用露天方式开采，采用公路开拓汽车运输的开采方案，选矿年设计采选能力 429 万吨，年产钼精粉 6000 吨
- 荣获辽宁省住房和城乡建设厅冶金工程类一等奖

- 15MCC designed the mining, processing, and tailings systems of this project
- The proven copper-molybdenum ore reserves are 140 million t, and the copper and molybdenum reserves are 100,000 t, so the mine is a large and medium-sized mine
- The open-pit mining method is adopted for the mine, and the mining scheme of road development and truck transportation is adopted. The annual design mining and processing capacity is 4.29 million t, and the annual output of molybdenum concentrates is 6,000 t/a
- It has won the First Prize for Metallurgical Engineering of the Department of Housing and Urban-Rural Development of Liaoning Province

● 赤峰金鑫矿业鸡冠山铜钼矿1万t/d采选扩建

10,000 TPD MINING AND PROCESSING EXPANSION PROJECT FOR JIGUANSHAN COPPER-MOLYBDENUM MINE OF SINOSTEEL CHIFENG JINXIN MINING CO., LTD.



- 该工程为采选尾设计项目
- 矿山采用露天方式开采，采用公路开拓汽车运输的开采方案，矿山现设计规模为采选10000吨/日，服务年限初期20年，总服务年限预期35年
- 每年矿石生产能力达330万吨，可年产45%钼精矿4283吨，每年实现利税3.29亿元

- 15MCC designed the tailings systems of this project
- The open-pit mining method is adopted for the mine, and the mining scheme of road development and truck transportation is adopted. The mine has a current design scale for mining and processing of 10,000 t/d, an initial service life of 20 years, and a total expected service life of 35 years
- The mine has an annual ore production capacity of 3.3 million t, an annual output of 45% molybdenum concentrates of 4,283 t/a, and an annual profit and tax of RMB 329 million

● 乌拉特前旗西沙德盖钼业300万t/a采选扩建

3 MTPA MINING AND PROCESSING EXPANSION PROJECT OF WULAT QIANQI XISHADEGAI MOLYBDENUM INDUSTRY CO., LTD.



- 该工程为露天开采设计项目，总投资 2.5 亿元，年开采矿石 300 万吨，加工钼精矿粉 3358 吨。
- 项目引进国内先进的磨矿，精选工艺设备选型将采用无功补偿，节能变频等装置，将产品综合能耗的产量值降低 30% 左右。

- 15MCC designed the project as an open-pit mine with a total investment of RMB 250 million, an annual ore mining capacity of 3 million t, and an annual molybdenum concentrate processing capacity of 3,358 t
- The project introduces domestically advanced grinding and processing equipment, such as reactive power compensation device and energy-saving frequency conversion device, reducing the comprehensive energy consumption of products by about 30%

● 抚顺红透山铜锌矿深部开采接续开拓系统

SUCCESSIVE DEVELOPMENT SYSTEM FOR DEEP MINING OF HONGTOUSHAN COPPER-ZINC MINE OF CHINA NONFERROUS HONGTOUSHAN FUSHUN MINING GROUP CO., LTD.



- 该工程为千米以下采矿设计项目，827m 标高以上采用竖井开拓，主井为混合井、副井为罐笼井；827m 标高以下采用主副井开拓
- 采矿方法为水平分层上向尾砂充填采矿法、浅孔留矿嗣后充填采矿法和分段空场嗣后充填采矿法
- 荣获 2018 年度中国有色金属建设协会（部级）优秀工程咨询成果二等奖

- 15MCC designed this project which involves mining below 1,000 m. For the area above EL. 827m, the shaft development is adopted, with the skip-cage combination shaft as the main shaft and the cage shaft as the auxiliary shaft. For the area below EL. 827m, the main and auxiliary shaft development is adopted
- The mining methods include upward horizontal cut and tailing fill stoping method, shallow shrinkage mining with delayed filling method, and sublevel open stoping afterwards back-fill mining method
- It won the Second Prize for Excellent Engineering Consulting Achievement for 2018 of China National Association for Non-Ferrous Metals Industries Construction (ministerial level)

● 内蒙古高尔旗银铅锌多金属矿

ABAGA BANNER GAOERQI SILVER-LEAD-ZINC POLYMETALLIC MINE OF INNER MONGOLIA GAOERQI MINING CO., LTD.



- 该工程为采选尾设计项目，项目设计规模为采选矿石 60 万 t/a(2000t/d)；服务 19.5 年
- 产品为铅精矿和锌精矿：铅精矿品位为 50%，年产精矿量 20196t(含银 1700g/t)；锌精矿品位为 45%，年产精矿量 17454t
- 荣获 2017 年度部级优秀工程咨询成果二等奖
- 2022 年度有色金属建设行业优秀工程设计二等奖

- 15MCC designed the mining, processing, and tailings systems of this project, with a design mining and processing scale of 600,000 t/a (2,000 t/d), and a service life of 19.5 years
- The products include lead concentrates and zinc concentrates. The lead concentrates have a grade of 50% and an annual output of 20,196 t/a (silver content: 1,700 g/t). The zinc concentrates have a grade of 45% and an annual output of 17,454 t/a
- It won the Second Prize for Excellent Engineering Consulting Achievement for 2017 (ministerial level)
- It won the Second Prize for Excellent Engineering Design in Nonferrous Metals Construction Industry for 2022

●赤峰宇邦矿业东矿区1900t/d采选

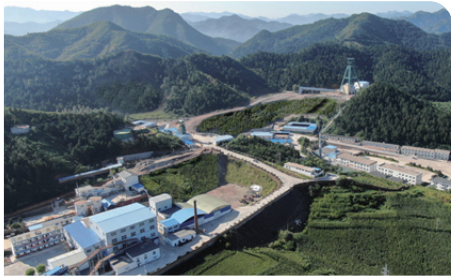
1900 TPD MINING AND PROCESSING PLANT IN THE EASTERN MINING AREA OF CHIFENG YUBANG MINING CO., LTD.



- 该工程为采选设计项目，生产能力为1900t/d。矿山采用竖井和斜坡道开拓，采矿方法有浅孔留矿采矿嗣后充填采矿法和分段空场嗣后充填采矿法
 - 选矿采用浮选工艺，破碎采用二段一闭路流程，磨矿为一段磨矿
 - 荣获2013年度部级优秀工程设计三等奖
 - 2022年度中国有色金属建设行业优秀工程咨询成果二等奖
- 15MCC designed the mining and processing systems of this project with a production capacity of 1900t/d. The mine is designed with the mode of development by shaft and ramp. The mining methods include shallow shrinkage mining with delayed filling method and sublevel open stoping afterwards back-fill mining method
 - Flotation, two-stage and one-closed-circuit crushing, and one-stage grinding are adopted
 - It won the Third Prize for Excellent Engineering Design for 2013 (ministerial level)
 - It won the Second Prize for Excellent Engineering Consulting Achievement in China's Nonferrous Metals Construction Industry for 2022

●凌源日兴矿业柏杖子金矿采矿技术改造

MINING TECHNOLOGY TRANSFORMATION OF BAIZHANGZI GOLD MINE OF CHINA NATIONAL GOLD GROUP LINGYUAN RIXING MINING CO., LTD.



- 该工程为采选技改设计项目，原来生产能力为450t/d，技改结束后生产能力为900t/d
 - 矿山采用竖井开拓，采矿方法有无底柱分段崩落采矿法、浅孔留矿采矿法、削壁充填采矿法和留矿全面采矿法；选矿采用浮选工艺，破碎采用二段一闭路流程，磨矿为一段磨矿
 - 荣获2016年度部级优秀工程咨询成果一等奖
 - 2021年度有色金属建设行业(部级)优秀设计三等奖

- 15MCC designed this technology transformation for the mining and processing systems of this project, resulting in an increase of the production capacity from 450 t/d to 900 t/d
- The mine is designed with the development by shaft. The mining methods include non-base column sectional ore-caving mining method, shallow-hole shrinkage mining method, wall cutting and filling milling method, and shrinkage breast method. Flotation, two-stage one-closed-circuit crushing, and single-stage grinding are adopted
 - It won the First Prize for Excellent Engineering Consulting Achievement for 2016 (ministerial level)
 - It won the Third Prize for Excellent Design in Nonferrous Metals Construction Industry for 2021 (ministerial level)



●近年典型工程业绩

TYPICAL PROJECT PERFORMANCE IN RECENT YEARS

序号 S/N	项目名称 PROJECT NAME	规模 SCALE	项目国别 COUNTRY	竣工时间 COMPLETION DATE
1	刚果矿业Panda 尾矿资源综合回收项目改扩建(铜) Reconstruction and Expansion Works of Panda Tailings Comprehensive Recovery Project of CNMC Congo Mining Co., Ltd. (Copper)	规模1500万吨/年 Scale: 15 million t/a	刚果(金) DRC	2017年
2	赞比亚谦比希铜矿东南矿区(铜) Southeast Mining Area of Zambia Chambishi Copper Mine of NFC AFRICA MINING PLC (Copper)	规模330万吨/年 Scale: 3.3 million t/a	赞比亚铜带省 Copperbelt Province, Zambia	2020年
3	刚果(金)Kalabi铜矿露天开采(铜) Kalabi Copper Mine Open-pit Mining Project in Likasi, Katanga Province, DRC	规模300万吨/年 Scale: 3 million t/a	刚果(金)加丹加省利卡西市 Likasi, Katanga Province, DRC	2020年
4	赞比亚谦比希湿法公司MWAMBASHI铜矿采选(铜) MWAMBASHI Copper Mine Mining and Processing Project of Sino-Metals Leach Zambia Limited (Copper)	规模66万吨/年 Scale: 660 kt/a	赞比亚铜带省 Copperbelt Province, Zambia	2020年
5	抚顺红透山铜锌矿深部开采接续开拓系统(铜) Successive Development System for Deep Mining of Hongtoushan Copper-Zinc Mine of China Nonferrous Hongtoushan Fushun Mining Group Co., Ltd. (Copper)	规模66万吨/年 Scale: 660 kt/a	中国辽宁省抚顺市 Fushun, Liaoning Province, China	2018年
6	赞比亚谦比希1000t/d选矿厂(铜) 1,000 t/d Processing Plant Project of Sino-Metals Leach Zambia Limited (Copper)	规模33万吨/年 Scale: 330 kt/a	赞比亚铜带省 Copperbelt Province, Zambia	2020年
7	哈尔滨金大铜锌矿业500t/d铜锌矿(铜、锌) 500 t/d Copper-Zinc Mine Project of Harbin Jinda Coppe and Zinc Mining Co., Ltd. (Copper and Zinc)	规模15万吨/年 Scale: 150 kt/a	中国黑龙江省哈尔滨市 Harbin, Heilongjiang Province, China	2022年
8	赤峰敖伦花钼铜矿(铜钼) Chifeng Aolunhua Molybdenum-Copper Mine (Copper and Molybdenum)	规模495万吨/年 Scale: 4.95 million t/a	中国内蒙古赤峰市 Chifeng, Inner Mongolia Autonomous Region, China	2023年
9	刚果(金)Kambove铜矿(铜) DRC Kambove Copper Mine Project of Kambove Mining SAS(Copper)	规模99万吨/年 Scale: 990 kt/a	刚果(金)卢本巴希市 Lubumbashi, DRC	2020年
10	赤峰金鑫矿业鸡冠山铜钼矿1万t/d采选扩建(钼) 10,000 TPD Mining and Processing Expansion Project for Jiguanshan Copper-Molybdenum Mine of Sinosteel Chifeng Jinxin Mining Co., Ltd. (Molybdenum)	规模300万吨/年 Scale: 3 million t/a	中国内蒙古赤峰市 Chifeng, Inner Mongolia Autonomous Region, China	2022年
11	乌拉特前旗西沙德盖钼业300万t/a采选扩建(钼) 3 MTPA Mining and Processing Expansion Project of Wulat Qianqi Xishadegai Molybdenum Industry Co., Ltd. (Molybdenum)	规模300万吨/年 Scale: 3 million t/a	中国内蒙乌拉特前旗 Wulat Qianqi, Inner Mongolia, China	2021年
12	凌源日兴矿业柏杖子金矿采矿技术改造(金) Mining Technology Transformation of Baizhangzi Gold Mine of China National Gold Group Lingyuan Rixing Mining Co., Ltd. (Gold)	规模27万吨/年 Scale: 270 kt/a	中国辽宁省凌源市 Lingyuan City, Liaoning Province, China	2021年
13	内蒙古高尔旗银铅锌多金属矿(铅锌) Abaga Banner Gaoerqi Silver-Lead-Zinc Polymetallic Mine of Inner Mongolia Gaoerqi Mining Co., Ltd.(Lead and Zinc)	规模60万吨/年 Scale: 600 kt/a	中国内蒙 Inner Mongolia Autonomous Region	2022年
14	赤峰宇邦矿业东矿区1900t/d采选(银铅) 1900 TPD Mining and Processing Plant in the Eastern Mining Area of Chifeng Yubang Mining Co., Ltd.(Silver and Lead)	规模57万吨/年 Scale: 570 kt/a	中国内蒙古赤峰市 Chifeng, Inner Mongolia Autonomous Region	2022年

MINE CONSTRUCTION

矿山建设

中国十五冶具有矿山工程施工总承包壹级资质，承建铜钴、铅锌、镍、稀贵金属、铁、稀土等矿山基建、选厂、尾矿库工程160余项。承建的蒙古敖包锌矿、赞比亚谦比希铜矿东南矿区工程荣获境外工程鲁班奖。

15MCC has Grade I qualification for general contracting of mine construction. It has undertaken more than 160 mine capital construction, processing plant, and TSF projects for copper-cobalt, lead-zinc, nickel, rare and precious metals, iron, and rare earth. The Obo Zinc Mine in Mongolia and the Southeast Mining Area Project of Zambia Chambishi Copper Mine undertaken by 15MCC won the Luban Prize (Overseas Project).

1 矿山井建 UNDERGROUND MINE WORKINGS

● 山东恒邦辽上金矿竖井工程

SHAFTS FOR LIAOSHANG GOLD MINE OF SHANDONG HUMON SMELTING CO., LTD.



- 该工程副井净直径 $\Phi 7.5\text{m}$ ，井深1235m；主井净直径 $\Phi 5.8\text{m}$ ，井深1235m
- 采用大提升、大吊桶、液压中心回转大抓岩机、液压伞钻、液压小型挖掘机清底等重型机械化成套凿井设备
- 采用钻爆法施工，短段掘砌混合作业，单月成井速度超120m
- The auxiliary shaft of the Project has a net diameter of $\Phi 7.5\text{m}$ and a depth of 1235m; the main shaft has a net diameter of $\Phi 5.8\text{m}$ and a depth of 1235m
- Heavy-duty mechanized complete shaft sinking equipment such as large hoists, large buckets, rotary large rock grabs at hydraulic centers, hydraulic umbrella drills and small hydraulic excavators for bottom clearing are adopted
- The borehole-blasting method is adopted for construction, the mixed digging and laying operation of short sections is applied, and the shaft completion speed in a single month exceeds 120m

● 荆门放马山莲花山磷矿工程

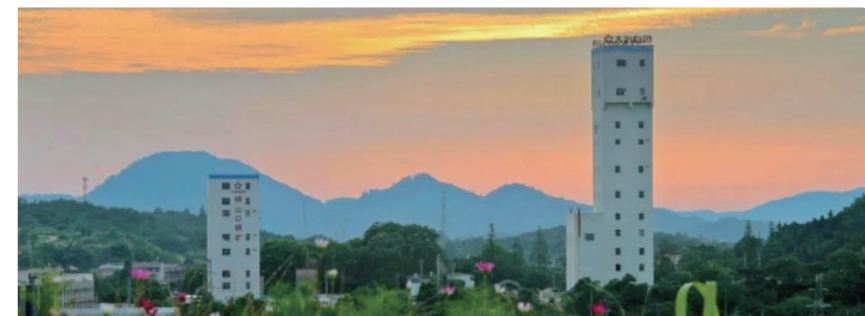
LIANHUASHAN PHOSPHORITE MINE OF JINGMEN FANGMASHAN ZHONGLIN MINING CO., LTD.



- 该工程矿石总储量为1.6亿t，生产能力150万t/a
- 采用地下开采，主副井开拓方式，主副井项目由中国十五冶承建
- 副井净直径 $\Phi 5.5\text{m}$ ，井深570m；主井净直径 $\Phi 4.5\text{m}$ ，井深545m
- The project has total ore reserves of 160 million t and a production capacity of 1.5 million t/a
- Underground mining and development by main and auxiliary shafts are adopted. The project is undertaken by 15MCC
- The auxiliary shaft has a net diameter of $\Phi 5.5\text{m}$ and a depth of 570m; the main shaft has a net diameter of $\Phi 4.5\text{m}$ and a depth of 545m

● 黄石大冶有色铜山口铜矿井建工程

SHAFT CONSTRUCTION FOR DAYE TONGSHANKOU COPPER MINE OF ZHONGSE



- 2013年转为露天与地下联合开采，生产能力132万t/a
- 地下开采为主副井开拓方式，采用对角式抽出式通风
- In 2013, the combined open-pit and underground mining method was adopted. The production capacity is 1.32 million t/a
- Underground mining is performed with the development by main and auxiliary shafts, and the diagonal air exhausted ventilation is adopted

● 黄石大冶有色丰山铜矿平巷施工工程

DRIFT CONSTRUCTION FOR FENGSHAN COPPER MINE



- 该工程生产规模为采选矿石66万t/a, 主要产品为铜精矿、钼精矿

- The project has a mining and processing capacity of 660,000 t/a. The main products are copper concentrates and molybdenum concentrates.



● 塔吉克斯坦帕鲁特金矿矿山建设工程

MINE CONSTRUCTION FOR MINING AND PROCESSING OF PAKRUT GOLD MINE IN TAJIKISTAN



- 该项目为地下矿山基建项目, 主要包括主斜坡道、东风井、西风井、2170米、2110米两个中段等开拓及井下安装工程

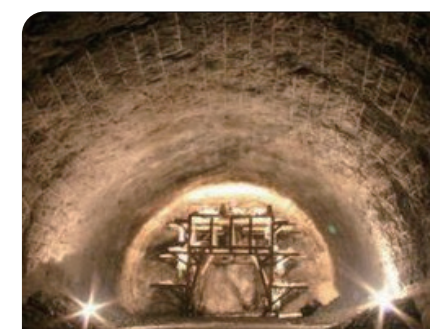
- 该项目为公司第一个国外地下矿山业务

- The project is an underground mine capital construction project, mainly including the development and downhole installation works of main ramp, east air shaft, west air shaft, and levels of 2,170 m and 2,110 m

- The project is the Company's first overseas underground mine business

● 黄石大冶有色铜绿山矿XI号矿体开拓

EXPLOITATION OF XI OREBODY IN DAYE TONGLUSHAN MINE OF ZHONGSE



- 该项目为地下矿山基建项目, 主要包含中段平巷、斜坡道、分段巷及溜井等工程
- 采用凿岩台车+电动铲运机的机械化钻爆法
- 主要巷道采用光面爆破技术

- The project is an underground mine capital construction project, mainly including level drift, ramp, sublevel roadway and pass
- Mechanized drilling and blasting method with drill jumbo + electric LHD
- Smooth blasting is used for main roadways

● 近年典型工程业绩

TYPICAL PROJECT PERFORMANCE IN RECENT YEARS

序号 S/N	项目名称 PROJECT NAME	规模 SCALE	项目国别 COUNTRY	竣工时间 COMPLETION DATE
1	山东恒邦辽上金矿竖井工程 Shafts for Liaoshang Gold Mine of Shandong Humon Smelting Co., Ltd.	竖井掘砌安装工程: Shaft digging, laying and installation works: 主井(Main shaft)φ=5.8m,H=1285.2m; 副井(Auxiliary shaft)φ=7.5m,H=1285.2m	中国山东省烟台市 Yantai, Shandong Province, China	2022年至今 2022-present
2	荆门放马山莲花山磷矿工程 Lianhuashan Phosphorite Mine of Jingmen Fangmashan Zhonglin Mining Co., Ltd.	竖井掘砌安装工程: Shaft digging, laying and installation works: 主井(Main shaft)φ=4.5m,H=545m; 副井(Auxiliary shaft)φ=5.5m,H=570m	中国湖北省荆门市 Jingmen, Hubei Province, China	2022年至今 2022-present
3	铜陵新桥矿业露天转地下采矿技改工程 Open-pit to Underground Mining Technical Transformation Project of TCIGCL Xin Qiao Mining Corporation Ltd.	主井深652m,副井深590m The main shaft is 652m deep and the auxiliary shaft is 590m deep	中国安徽省铜陵市 Tongling, Anhui Province, China	2020年
4	黄石大冶有色丰山铜矿盲回风井工程 Blind Air Return Shaft Project of Huangshi Daye Fengshan Copper Mine of Zhongse	盲竖井 φ=4.0m,H=320m Blind shaft: φ=4.0m,H=320m	中国湖北省黄石市 Huangshi, Hubei Province, China	2019年
5	黄石大冶有色丰山铜北回风井工程 North Return Air Shaft Project of Huangshi Daye Fengshan Copper Mine of Zhongse	竖井 φ=4.0m,H=430m Shaft: φ=4.0m,H=430m	中国湖北省黄石市 Huangshi, Hubei Province, China	2016年
6	黄石大冶铜山口铜矿井建工程 Shaft Construction for Daye Tongshankou Copper Mine of Zhongse	风井 φ=5.5m,H=870m Air shaft: φ=5.5m,H=870m	中国湖北省黄石市 Huangshi, Hubei Province, China	2015年
7	鹰潭江铜银珠山-190至-140m TBM开拓工程 -190--140m TBM Development Project of Yingtian Jiangxi Copper Yinzhusan Mining Co., Ltd.	掘进工程量4KM Tunneling quantity: 4KM	中国江西省银谭市 Yintan, Jiangxi Province, China	2023年至今 2023-present
8	德兴江铜银山矿业-378中段巷道开拓工程 -378 Level Roadway Development Project of Jiangxi Copper Corporation Limited Yinshan Mining Co., Ltd.	掘进工程量6万方 Excavation quantity: 60,000 m³	中国江西省德兴市 Dexing, Jiangxi Province, China	2022年至今 2022-present
9	黄石大冶铜绿山矿-425~-725m中段开拓 -425--725m Level Development in Daye Tonglushan Mine of Zhongse	掘进工程量12万方 Tunneling quantity: 120,000 m³	中国湖北省黄石市 Huangshi, Hubei Province, China	2014年至今 2014-present
10	黄石大冶丰山铜矿平巷施工工程 Drift Construction for Fengshan Copper Mine	掘进工程量10万方 Tunneling quantity: 100,000 m³	中国湖北省黄石市 Huangshi, Hubei Province, China	2014年至今 2014-present
11	黄石大冶铜山口矿-100~-280m中段开拓 -100--280m Level Development of Daye Tongshankou Mine of Zhongse	掘进工程量13万方 Excavation quantity: 130,000 m³	中国湖北省黄石市 Huangshi, Hubei Province, China	2021年
12	塔吉克斯坦帕鲁特金矿采选矿山建设工程 Mine Construction for Mining and Processing of Pakrut Gold Mine in Tajikistan	掘进工程量5万方 Excavation quantity: 50,000 m³	塔吉克斯坦杜尚别 Dushanbe, Tajikistan	2019年
13	黄石大冶铜绿山矿 XI 号矿体开拓 Exploitation of XI Orebody in Daye Tonglushan Mine of Zhongse	掘进工程量16万方 Excavation quantity: 160,000 m³	中国湖北省黄石市 Huangshi, Hubei Province, China	2019年
14	喀什萨热克铜矿基建 Capital Construction of Xinjiang Sareke Copper Mine	掘进工程量20万方 Excavation quantity: 200,000 m³	中国新疆喀什市 Kashgar, Xinjiang, China	2017年
15	哈密金矿溜破系统 Ore Pass Fragmenting System of Hami Gold Mine	掘进工程量16万方 Excavation quantity: 160,000 m³	中国新疆哈密市 Hami, Xinjiang, China	2016年

2 选矿工程

PROCESSING PLANTS

● 哈萨克斯坦巴夏库选矿厂工程

KAZAKHMYS LLP BASHAKU COPPER PROCESSING PLANT PROJECT



- 该工程处理矿石能力为3000万t/a，项目完全以欧美标准设计、施工、采购及管理
- 装备有当时世界最先进最大的GMD无齿传动球磨机（Φ8.53*13.1m）、半自磨机（Φ12.19*7.92m）
- 荣获哈萨克斯坦工业质量最高奖“金鹰”奖
- The ore processing capacity of the project is 30 million t/a, and the project is designed, constructed, purchased and managed in accordance with European and American standards
- It is equipped with the world's most advanced and largest GMD toothless transmission ball mill (Φ8.53*13.1m) and semi-autogenous mill (Φ12.19*7.92m) at the time
- Awarded the "Golden Eagle" award for the highest industrial quality in Kazakhstan

● 厄瓜多尔米拉多2000万吨铜矿选矿工程

MIRADOR 20 MILLION T/A COPPER PROCESSING PLANT IN ECUADOR



- 该矿是一座由中国投资、中国设计、中国制造、中国施工、中国运营的世界级铜矿
- 工程使用2台Φ7.9×13.60m溢流型球磨机、2台Φ10.97×5.4m半自磨机，成功跻身世界级在产大型矿山之列，绘就了“中国有色金属行业企业海外办矿的成功典范”
- The mine is a world-class copper mine invested, designed, manufactured, constructed, and operated by China
- Two Φ7.9x13.60m overflow ball mills and two Φ10.97x5.4m SAG mills were used in the Project, successfully ranking the mine among the world-class large mines in production and establishing a "successful model for overseas mining by China's nonferrous metal industry enterprises"

● 赞比亚谦比希铜矿东南矿体选矿厂工程

PROCESSING PLANT OF SOUTHEAST ORE BODY OF ZAMBIA CHAMBISHI COPPER MINE



- 该工程设计采选规模330万t/a，为非洲第一座数字化矿山，绿色环保样板矿山；
- 荣获“中国建设工程（境外工程）鲁班奖”
- With a designed mining and processing scale of 3.3 million t/a, the project is the first digital mine in Africa and a green and environmentally friendly model mine
- It won the "China Construction Engineering Luban Prize (Overseas Project)"

● 内蒙古满洲里乌努格吐山铜钼矿工程

UNUGE TUSHAN COPPER-MOLYBDENUM MINE PROJECT OF CHINA NATIONAL GOLD GROUP



- 该工程安装半自磨机和溢流型球磨机创最大安装记录；
- 荣获“国家优质工程奖”
- The project sets the record of largest SAG mill and overflow ball mill installation
- It won the National Quality Project Award

● 冕宁牦牛坪稀土矿矿产资源开发项目采选工程

MINING AND PROCESSING PLANT OF MAONIUPING RARE EARTH MINERAL RESOURCES DEVELOPMENT PROJECT IN MIANNING COUNTY



- 该工程为国内第二大稀土矿；
- 采用“粗碎—半自磨—球磨—顽石”破碎系统；“磁—重—浮”选别系统
- This is the second largest rare earth mine in China
- The "coarse crushing - SAG milling - ball milling - pebble crushing" system and the "magnetic separation - gravity separation - flotation" system are adopted

● 赣州稀土友力科技年产6600吨稀土氧化物回收利用技术改造工程项目

TECHNICAL TRANSFORMATION FOR COMPREHENSIVE RECOVERY AND UTILIZATION IN 6,600 T/A RARE EARTH OXIDE NDFEB WASTES PROJECT OF GANZHOU RARE EARTH YOU LI TECHNOLOGY CO., LTD.



- 该工程属技改工程。项目以钕铁硼废料为原料，通过综合利用回收稀土氧化物
- 年产稀土氧化物6600t/a
- The project is a technical transformation project. The project takes NdFeB wastes as raw materials for comprehensive utilization and recovery of rare earth oxide
- The annual output of rare earth oxide is 6,600 t/a

● 德兴江铜银山矿5000t/d 改造工程

5000 T/D RECONSTRUCTION OF YINSHAN MINE OF JIANGXI COPPER



- 该工程建筑面积21700 m²，设计产能5000t/d，年处理能力165万t
- 在国内工艺设备先进、能耗低、产能高、环保节能、循环经济效果较好的5000t/d选矿生产线
- The project has a building area of 21,700 m², with a design capacity of 5,000 t/d, and an annual processing capacity of 1.65 million t/a
- It is a 5,000 t/d processing production line with advanced process equipment, low energy consumption, high capacity, environmental protection, energy saving, and good circular economy effect in China

● 本溪龙新矿业思山岭铁矿一期采选工程

MINING AND MINERAL PROCESSING PROJECT (PHASE I) OF SISHANLING IRON MINE OF LONGXIN MINING CO., LTD.



- 该工程是目前国内探明登记的最大单体铁矿
- 该工程一期1500万t/a采选工程，铁精粉产量500万t/a，选矿品位可达到67-69%
- The project is the largest single iron ore proved and registered in China at present
- Phase I of the project is a 15 million t/a mining and mineral processing project, with an iron concentrate production capacity of 5 million t/a and a processing grade of 67-69%

● 近年典型工程业绩

TYPICAL PROJECT PERFORMANCE IN RECENT YEARS

序号 S/N	项目名称 PROJECT NAME	规模 SCALE	项目国别 COUNTRY	竣工时间 COMPLETION DATE
1	哈萨克斯坦哈铜巴夏库选矿厂工程(铜) Kazakhmys LLP Bashaku Copper Processing Plant Project (copper)	规模3000万吨/年 Scale: 30 million t/a	哈萨克斯坦巴甫洛达尔州 Pavlodar Region, Kazakhstan	2015年
2	哈萨克斯坦Aktogay铜选厂工程(铜) Aktogay Copper Processing Plant Project in Kazakhstan (Copper)	规模2500万吨/年 Scale: 25 million t/a	哈萨克斯坦	2017年
3	厄瓜多尔米拉多2000万吨铜矿选矿工程(铜) Mirador 20 Million t/a Copper Processing Plant in Ecuador (Copper)	规模2000万吨/年 Scale: 20 million t/a	厄瓜多尔东萨莫拉-钦奇佩省 East Zamora-Chinchipe Province, Ecuador	2019年
4	内蒙古满洲里乌努格吐山铜钼矿工程(铜、钼) Unuge Tushan Copper-Molybdenum Mine Project of China National Gold Group (Copper and Molybdenum)	规模1000万吨/年安装了2台当时亚洲最大的磨机 Scale: 10 million t/a; two of the largest mills in Asia at that time were installed	中国内蒙古呼伦贝尔市 Hulunbuir, Inner Mongolia Autonomous Region, Chin	2012年
5	刚果(金)迪兹瓦铜钴矿(铜) DRC Deziwa Copper-Cobalt Mine (Copper)	规模450 万吨/年 Scale: 4.5 million t/a	刚果(金)加丹加省 Katanga Province, DRC	2020年至今 2020-present
6	赞比亚谦比希铜矿东南矿区选矿厂工程(铜) Processing Plant of Southeast Ore Body of Zambia Chambishi Copper Mine (Copper, Luban Prize)	规模240万吨/年 Scale: 2.4 million t/a	赞比亚共和国铜带省 Copperbelt Province, The Republic of Zambia	2018年
7	韶关大宝山矿业7000t/d铜硫选厂工程(铜) 7,000 t/d Copper-Sulfur Processing Plant Project of Guangdong Dabaoshan Mining Co., Ltd. (Copper)	规模210万吨/年 Scale: 2.1 million t/a	中国广东省韶关市 Shaoguan, Guangdong Province, China	2017年
8	刚果(金)萨布韦龙溪铜矿工程(铜) Sabwe Lonshi Copper Mine Copper in DRC (Copper)	规模150万吨/年 Scale: 1.5 million t/a	刚果(金)加丹加省 Katanga Province, DRC	2023年
9	刚果(金)希图鲁铜矿(铜) DRC Chituru Copper Mine (Copper)	规模90万吨/年 Scale: 900kt/a	刚果(金)加丹加省 Katanga Province, DRC	2011年
10	九江武山铜矿三期扩建工程一磨矿及浮选系统工程(铜) Jiujiang Wushan Copper Mine Phase III Expansion Project - Grinding and Flotation System Project (Copper)	规模90万吨/年 Scale: 900kt/a	中国江西省九江市 Jiujiang, Jiangxi Province, China	2023年至今 2023-present
11	刚果(金)铬钼TFM工程(铜、钴) Chromium-Molybdenum TFM Project in DRC (Copper and Cobalt)	规模890万吨/年 Scale: 8.9 million t/a	刚果(金)加丹加省 Katanga Province, DRC	2023年
12	刚果(金)SICOMINES铜钴矿采选一期工程(铜、钴) SICOMINES Copper-Cobalt Mine Mining and Processing Project Phase I in DRC (Copper, Cobalt, Luban Prize)	规模455万吨/年 Scale: 4.55 million t/a	刚果(金)加丹加省科伟卢齐市 Kolwezi, Katanga Province, DRC	2015年
13	刚果(金)KFM混合矿开发项目中区工程(铜、钴) Central Area Project of KFM Mixed Ore Development Project in DRC (Copper and Cobalt)	规模99万吨/年 Scale: 990kt/a	刚果(金)卢阿拉巴省 Lualaba Province, DRC	2023年
14	赤峰宇邦矿业5000t/d选矿厂技术改造 工程(铅、锌) Technical Transformation Project for 5,000 t/d Processing Plant of Chifeng Yubang Mining Co., Ltd. (Lead and Zinc)	规模150万吨/年 Scale: 1.5 million t/a	中国内蒙古赤峰市 Chifeng, Inner Mongolia Autonomous Region, China	2021年
15	德兴江铜银山矿5000t/d改造工程(铅、锌) 5000 t/d Reconstruction of Yinshan Mine of Jiangxi Copper (Lead and Zinc)	规模150万吨/年 Scale: 1.5 million t/a	中国江西省德兴市 Dexing, Jiangxi Province, China	2012年
16	上饶江铜银山矿业铅锌选矿厂迁建工程(铅、锌) Lead-Zinc Processing Plant Relocation Project of Yinshan Mine of Jiangxi Copper (Lead and Zinc)	规模150万吨/年 Scale: 1.5 million t/a	中国江西省上饶市 Shangrao, Jiangxi Province, China	2019年

序号 S/N	项目名称 PROJECT NAME	规模 SCALE	项目国别 COUNTRY	竣工时间 COMPLETION DATE
17	蒙古国图木尔廷敖包锌矿(锌) Tumuerting-Aobao Zinc in Mongolia (Zinc)	规模70万吨/年 Scale: 700kt/a	蒙古国苏赫巴托省西乌尔蒂斯 Baruun-Urt, Sukhbaatar, Mongolia	2005年
18	常宁水口山康家湾矿技术升级改造工程EPC 总承包工程(铅、锌) Technology Upgrading and Reconstruction EPC Project for Kangjiawan Mine of Shui Kou Shan (Lead and Zinc)	规模66万吨/年 Scale: 660kt/a	中国湖南省常宁市 Changning, Hunan Province, China	2023年
19	二道河银铅锌矿2000吨/日采选工程 选矿工程总承包工程(银、铅) 2,000 t/d Mining and Processing EPC Project for Erdaohe Silver-Lead-Zinc Mine of Guosen Mining Co., Ltd. (Silver and Lead)	规模60万吨/年 Scale: 600kt/a	中国黑龙江省二道河市 Erdaohe, Heilongjiang Province, China	2015年
20	赤峰玉龙矿业股份有限公司 1400t/d 选矿厂技改工程(铅、锌) 1,400 t/d Processing Plant Technical Transformation Project of Inner Mongolia Yulong Mining Industry Co., Ltd. (Lead and Zinc)	规模42万吨/年 Scale: 420kt/a	中国内蒙古赤峰市 Chifeng, Inner Mongolia Autonomous Region, China	2021年
21	塔吉克斯坦帕鲁特金矿工程(金) Pakrut Gold Mine Project in Tajikistan (Gold)	规模130万吨/年 Scale: 1.3 million t/a	塔吉克斯坦瓦赫达特地区 Vahdat, Tajikistan	2015年
22	丹东招金白云黄金矿业选矿厂、尾矿库及生活区建设工程(金) Processing Plant, TSF, and Living Quarters Construction Project of Liaoning Zhaojin Baiyun Gold Mining Co., Ltd. (Gold)	规模100万吨/年 Scale: 1 million t/a	中国辽宁省丹东市 Dandong, Liaoning Province, China	2013年
23	云南华联锌铟股份有限公司都龙矿区 8000t/d选矿扩建(锌、铟、锡) 8000t/d Ore Dressing Expansion Project (Zn, In and Sn) of Dulong Mining Area of Yunnan Hualian Zinc and Indium Stock Co., Ltd.	规模240万吨/年 Scale: 2.4 million t/a	中国云南文山州 China Yunnan Wenshan Prefecture	2014年
24	唐山首钢滦南马城矿业采选选厂工程(铁) Processing Plant of Mining and Mineral Processing Project of Shougang Luannan Macheng Mining Co., Ltd.(Iron)	规模2000万吨/年 Scale: 20 million t/a	中国河北省唐山市 Tangshan, Hebei Province, China	2020年至今 2020-present
25	太原袁家村铁矿项目磨矿磁选工程(四标段)(铁) Ore Grinding and Magnetic Separation Works (Bid Section IV) of Yuanjiacun Iron Mine Project of TISCO (Iron)	规模2000万吨/年 Scale: 20 million t/a	山西省太原市 Taiyuan, Shanxi Province, China	2011年
26	本溪龙新矿业思山岭铁矿一期采选工程(铁) Mining and Mineral Processing Project (Phase I) of Sishanling Iron Mine of Longxin Mining Co., Ltd. (Iron)	规模1500万吨/年 Scale: 15 million t/a	中国辽宁省本溪市 Benxi, Liaoning Province, China	2023年至今 2023-present
27	俄罗斯KIMKAN铁矿选矿厂EPC总承包工程(铁) KIMKAN Iron Mine Processing Plant EPC Project in Russia (Iron)	规模1000万吨/年 Scale: 10 million t/a	俄罗斯犹太自治州奥布卢齐 Obluchensky, Jewish Autonomous Oblast, Russia	2016年
28	蒙古哈拉特乌拉铁锌矿选矿厂(铁、锌) Kharat Ulla Iron-Zinc Mine Processing Plant Project in Mongolia (Iron and Zinc)	规模130万吨/年 Scale: 1.3 million t/a	蒙古国中戈壁省 Dungovi Province, Mongolia	2013年
29	利比里亚邦矿先期100万t/a铁精矿选矿厂及 配套建安工程(铁) Early Phase 1 Million t/a Iron Concentrate Processing Plant and Supporting Construction and Installation Project of Bong Mine in Liberia (Iron)	规模100万吨/年 Scale: 1 million t/a	利比里亚邦州邦镇 Bong County, Bong State, Liberia	2015年
30	冕宁县牦牛坪稀土矿矿产资源开发项目采选 工程(稀土) Mining and Processing Plant of Maoniuping Rare Earth Mineral Resources Development Project in Mianning County (Rare Earth)	规模135万吨/年 Scale: 1.35 million t/a	中国四川省冕宁县 Mianning, Sichuan Province, China	2016年
31	赣州稀土友力科技年产6600吨稀土氧化物钕 铁硼废料综合利用技术改造工程(稀土) Technical Transformation for Comprehensive Recovery and Utilization in 6,600 t/a Rare Earth Oxide NdFeB Wastes Project of Ganzhou Rare Earth Youli Technology Co., Ltd. (Rare Earth)	规模6600吨/年 Scale: 6600 t/a	中国江西省赣州 Ganzhou, Jiangxi Province, China	2023年至今 2023-present
32	哈萨克斯坦巴库塔钨矿项目选矿厂(钨) Processing Plant of Bakuta Tungsten Mine Project in Kazakhstan (Tungsten)	规模330万吨/年 Scale: 3.3 million t/a	哈萨克斯坦阿拉木图州 Almaty Oblast, Kazakhstan	2022年至今 2022-present
33	沙特阿拉伯乌姆乌阿磷矿项目选矿工程(磷) Processing Plant of Umm Wu'a Phosphate Mine Project in Saudi Arabia (Phosphate)	规模1250万吨/年 Scale: 12.5 million t/a	沙特阿拉伯图赖夫市 Saudi Arabia Turaiif	2016年
34	新疆罗布泊年产120万吨钾肥项目(钾) Xinjiang Lop Nur 1.2 million t/a Potash Fertilizer Project (Potassium)	规模120万吨/年 Scale: 1.2million t/a	中国新疆自治区巴音州 China Xinjiang Uygur Autonomous Region Bayin Prefecture	2008年

3 尾矿工程

TAILINGS STORAGE FACILITIES (TSFS)

● 德兴铜矿5#尾矿库工程

5# TAILINGS STORAGE FACILITY IN DEXING COPPER MINE OF JIANGXI COPPER CORPORATION



- 该工程由尾矿库上游坝、下游坝、分级排放系统、安全监测等工程组成
- 设计总库容10.313亿m³、总坝高222m的一等库，处理尾矿12.6万t/d
- 总占地面积13.41Km²，为亚洲最大尾矿库
- The project consists of the upstream dam, downstream dam, staged discharge system, safety monitoring system, etc. of the tailings storage facility
- The designed total storage capacity is 1.0313 billion m³, it is the first-class tailings storage facility with a total dam height of 222m, and the tailings treatment capacity is 126,000 t/d
- Covering a total area of 13.41 km², it is the largest tailings storage facility in Asia

● 吉尔吉斯斯坦塔尔德布拉克左岸金矿浮选尾矿库工程

TALDY-BULAK LEFT-BANK GOLD ORE FLOTATION TAILINGS STORAGE FACILITY IN KYRGYZSTAN



- 该工程是吉尔吉斯斯坦最高、库容较大的尾矿库，也是中国投资海外最大的尾矿库，库容1.06亿m³
- The project is the highest and largest TSF in Kyrgyzstan, as well as the largest one invested overseas by China. Storage capacity: 106 million m³

● 黄石铜绿山铜铁矿尾矿库闭库工程

TONGLUSHAN COPPER-IRON MINE TSF CLOSURE PROJECT



- 该工程为上游式四面筑坝平地型尾矿库，库长1Km，宽0.7Km
- 汇水面积0.56Km²，经过四次加高后库容达1642.33万m³
- The project is an upstream flat-type TSF with four-side damming, with a length of 1Km and a width of 0.7Km
- The catchment area is 0.56Km², and the storage capacity after four times of heightening reaches 16,423,300 m³

● 西昌重钢1000万吨年钒钛磁铁矿尾矿输送系统EPC工程

10 MTPA VANADIUM-TITANIUM-MAGNETITE MINING AND PROCESSING EXPANSION PROJECT OF CHONGQING IRON & STEEL GROUP XICHANG MINING CO., LTD. - EPC PROJECT OF TAILINGS CONVEYING SYSTEM



- 该工程设计输送尾矿干矿量为774.66万t/a，项目运用目前矿浆管道输送领域的最新设计理念，采用一流设备。
- The project is designed to transport 7,746,600 t/a of dry tailings. The latest design concept in the field of pulp pipeline transportation and first-class equipment is adopted for the project.

● 西昌重钢极贫矿综合回收利用EPC工程

EPC PROJECT FOR COMPREHENSIVE RECOVERY AND UTILIZATION OF EXTREMELY LEAN ORE BY CHONGQING IRON & STEEL GROUP XICHANG MINING CO., LTD.



- 该工程为州、市重点建设EPC项目
 - 该工程为自动化、无人化、智能化的黑灯工厂；生产、办公、科普为一体的花园工厂
 - 年产500万吨
- The project is a key construction EPC project of Xichang, Liangshan Prefecture
 - The project is an automatic, unmanned, and intelligent dark factory, as well as a garden factory integrating production, office, and science popularization
 - The product has an annual output of 5 million t/a

● 刚果（金）RTR尾矿综合回收铜、钴工程

COPPER AND COBALT COMPREHENSIVE RECOVERY PROJECT OF RTR TSF IN DRC



- 该工程利用当地废弃的尾矿综合回收铜和钴，尾矿资源量1.128亿t
 - 生产阴极铜10.5万t/a、钴3.4万t/a
 - 该矿从废弃的尾矿堆一跃蜕变成成为全球最大钴矿之一
- In the project, local abandoned tailings are used to comprehensively recover copper and cobalt, and the tailings resources are 112.8 million tons
 - Cathode copper produced: 105,000 t/a; cobalt produced: 34,000 t/a
 - The mine was transformed from an abandoned tailings pile into one of the largest cobalt mines in the world

● 近年典型工程业绩

TYPICAL PROJECT PERFORMANCE IN RECENT YEARS

序号 S/N	项目名称 PROJECT NAME	规模 SCALE	项目国别 COUNTRY	竣工时间 COMPLETION DATE
1	刚果(布)索瑞米铜铅锌多金属矿开发项目三期尾矿库扩容工程 TSF Expansion Works of Soremi Copper-Lead-Zinc Mine Development Project (Phase III) in the Republic of the Congo	土方总量60万m³ 防渗面积18万m² Total volume of earthwork: 600,000 m³; anti-seepage area: 180,000 m²	刚果(布)布恩扎省 Bouenza, The Republic of the Congo	2023年
2	刚果(金)迪兹瓦尾矿库二期工程 Deziwa TSF Phase II Project in DRC	库容2874.78万m³ Storage capacity 28,747,800 m³	刚果(金)卢阿拉巴省 Lualaba Province, DRC	2022年
3	德兴铜矿5#尾矿库工程 5# Tailings Storage Facility in Dexing Copper Mine of Jiangxi Copper Corporation	设计总库容10.313亿m³ Designed total storage capacity: 1,031.3 million m³	中国江西省德兴市 Dexing, Jiangxi Province, China	2020年
4	赞比亚谦比希铜矿东南矿体膏体充填工程 Paste Filling Project of Southeast Ore Body of Zambia Chambishi Copper Mine	生产规模：150万m³/年 Production scale: 1,500,000 m³/a	赞比亚铜带省谦比希镇 Chambishi Town, Copperbelt Province, Zambia	2018年
5	黄石铜山口铜矿尾矿库接替工程 TSF Replacement Project of Tongshankou Copper Mine	坝长1173m 总库容500万m³ Dam length: 1,173 m; total storage capacity: 5 million m³	中国湖北省黄石市 Huangshi, Hubei Province, China	2016年
6	冕宁县耗牛坪稀土矿矿产资源综合开发项目尾矿坝工程 Tailings Dam for Mining and Processing Works of Maoniuping Rare Earth Mineral Resources Development Project in Mianning County	汇水面积 6.85km² 坡面面积9.63万m² Catchment area: 6.85km²; slope area: 96,300m²	中国四川省凉山州 Liangshan Prefecture, Sichuan Province, China	2014年
7	吉尔吉斯斯坦塔尔德布拉克左岸金矿浮选尾矿库工程 Taldy-Bulak Left-bank Gold Ore Flotation Tailings Storage Facility in Kyrgyzstan	库容1.06亿m³ storage capacity: 106 million m³	吉尔吉斯斯坦楚河州克明区 Keming District, Chuhe Oblast, Kyrgyzstan	2014年
8	洛阳栾川龙宇铝业陶湾咸池沟尾矿库 Taowan Xianchigou Tailings Pond of Luoyang Luanchuan Longyu Molybdenum Co., Lt	库容1亿m³ storage capacity: 100 million m³	中国河南省洛阳市 Luoyang, Henan Province, China	2023年至今 2023-present
9	黄石铜绿山铜铁矿尾矿库闭库工程 Tonglushan Copper-iron Mine TSF Closure Project	库容1642.33万m³ Storage capacity: 16423300 m³	中国湖北省黄石市 Huangshi, Hubei Province, China	2019年
10	黄石铜山口铜矿周家园尾矿库闭库治理工程 Closure Treatment Project of Zhoujiayuan TSF in Tongshankou Copper Mine	库容1650万m³ Storage capacity: 16.5 million m³	中国湖北省黄石市 Huangshi, Hubei Province, China	2018年
11	西昌重钢1000万吨年钒钛磁铁矿尾矿输送系统EPC工程 10 MTPA Vanadium-Titanium-Magnetite Mining and Processing Expansion Project of Chongqing Iron & Steel Group Xichang Mining Co., Ltd. - EPC Project of Tailings Conveying System	规模1000万吨/年 Scale: 10million t/a	中国四川省凉山州西昌市 Xichang, Liangshan Prefecture, Sichuan Province, China	2019年
12	西昌重钢极贫矿综合回收利用EPC工程 EPC Project for Comprehensive Recovery and Utilization of Extremely Lean Ore by Chongqing Iron & Steel Group Xichang Mining Co., Ltd.	规模500万吨/年 Scale: 5 million t/a	中国四川省凉山州西昌市 Xichang, Liangshan Prefecture, Sichuan Province, China	2023年至今 2023-present
13	刚果(金)RTR尾矿综合利用回铜、钴工程 Copper and Cobalt Comprehensive Recovery Project of RTR TSF in DRC	规模10.5万吨/年 Scale: 105kt/a	刚果(金) DRC	2017年

MINING

矿山采矿

中国十五冶形成了成熟的国内外矿山开采组织管理体系。拥有地、测、采等矿山专业工程师近百人，培养了一支专业技术门类齐全、经验丰富、具有开拓创新精神的技术队伍和管理团队；拥有穿孔爆破、采掘、运输、排土等各类国际一流矿山开发设备200余台套，设备原值8亿元，年生产采剥能力6000万吨。

15MCC has formed a mature mining organization and management system for mines at home and abroad. It has nearly 100 engineers specialized in geological exploration, reconnaissance, mining, etc., and cultivated a technical and management team with complete professional technical categories, rich experience, and pioneering spirit. It has more than 200 sets of world-class mine development equipment for drilling and blasting, mining, transportation, and dumping. The equipment has an original value of RMB 800 million and an annual production and stripping capacity of 60 million t/a.

● 赞比亚卢安夏穆利亚希采矿

MULIASHI MINE IN LUANSHYA, ZAMBIA



- 该矿山曾位居世界三大铜矿山之列，项目集露天采矿、选矿和冶炼为一体
- 每年采剥总量2000万吨，采用100t矿卡、12m³、4m³沃尔沃液压铲运机，年产4.1万吨阴极铜
- The mine once ranked among the top three copper mines in the world. The project integrates open-pit mining, processing, and smelting
- The total annual mining and stripping amount is 20 million t, The project uses 100t mining trucks, 12 m³ and 4 m³ Volvo hydraulic scrapers, It has an annual output of cathode copper of 41,000 t/a

● 刚果（金）迪兹瓦铜钴矿采矿

DEZIWA OPEN-PIT COPPER MINE PROJECT IN DRC



- 该工程为是中国有色集团单体投资规模最大的海外铜钴资源开发项目；
- 该工程集露天基建剥离、采矿、选矿和冶炼为一体，年采剥总量1000万t/a；
- 荣获2020年度“境外优质工程奖”
- This project is an overseas copper-cobalt resource development project with the largest single investment scale of China Nonferrous Metal Mining (Group) Co., Ltd.
- The project integrates stripping, mining, processing, and smelting for surface mine capital construction, with an annual mining and stripping capacity of 10 million t/a
- It won the "Overseas Quality Engineering Award" for 2020

● 刚果（金）SICOMINES铜钴矿采矿

SICOMINES COPPER-COBALT MINE IN DRC



- 该工程集露天采矿、选矿和冶炼为一体，是中国与非洲按照“资源换项目”的合作项目
- 每年生产1800万吨矿，采用60t-95t矿卡、4.2m³-5.4m³挖掘机
- 荣获境外国家优质工程奖
- The project integrates open-pit mining, mineral processing and smelting. It is a cooperative project between China and Africa under the "Resource for Project" scheme
- The annual production is 18 million tons of ore; 60t-95t mining trucks and 4.2m³ -5.4m³ excavators are adopted
- It won the Overseas National Quality Project Award

● 缅甸达贡山镍矿采矿

TAGAUNG TAUNG NICKEL MINE IN MYANMAR



- 该工程为集采、选、冶于一体的特大型镍铁项目
- 采用水淬粒化的特大型优质红土型镍矿火法，年处理130万吨（干基）红土镍矿，年产镍铁8.5万吨，含镍2.3万吨。
- 我公司对该露天矿山承包从安全、生产、技术等全面实施管理。
- The project is a super-large ferro-nickel project integrating mining, dressing and smelting
- It adopts water-quenched granulated super-large high-quality laterite nickel ore pyrometallurgical process, with an annual processing capacity of 1.3 million tons (dry basis) of laterite nickel ore, and an annual output of 85,000 tons of ferronickel, including a nickel output of 23,000 tons.
- Our company manages the contracting of the open-pit mine comprehensively from the standpoints of safety, production and technology, etc.

● 河北金厂峪金矿采矿

HEBEI JINCHANGYU GOLD MINE



- 该工程位于河北省迁西县金厂峪镇，采剥总工程量666万立方米（1851万吨），其中矿石量59万立方米（165万吨）
- The project is located in Jinchangyu Town, Qianxi County, Hebei Province. The total mining and stripping volume is 6.66 million m³ (18.51 million t), including 590,000 m³ (1.65 million t) ore.

● 漳州福能竹坑尾（花岗岩）矿山开采

LONGHAI ZHUKENGWEI (GRANITE) MINE OF FUJIAN ENERGY GROUP



- 该矿区总占地面积：0.6974平方公里，资源量3182万方，矿山为露天开采，年生产规模300万立方米
- 采用挖掘机（4.6m³）、自卸式卡车（60吨）、全液压钻机等机械化配套设备
- The total area of the mining area is 0.6974 square kilometers and the resources are 31.82 million cubic meters. Open-pit mining is adopted for the mine and the annual production scale is 3 million cubic meters
- Mechanized supporting equipment such as excavators (4.6m³), dump trucks (60 t) and full hydraulic drilling rigs are used

● 新疆萨热克地下采矿

XINJIANG SAREKE UNDERGROUND MINE



- 该工程是中国最西部的大型铜矿山，在海拔3000m之上的大山中
- 该工程采用斜坡道开拓，生产规模为采选综合能力116万t/a
- 采用的采矿方法有分段空场嗣后充填法及机械化盘区点柱式上向分层充填法

- The Project is a large-scale copper mine in the westernmost part of China, located in the mountains above 3000m above sea level
- The Project is designed with the mode of development by ramp, with a comprehensive mining and processing capacity of 1.16 million t/a
- The mining methods adopted include sublevel open stoping with post filling and mechanized panel point-column overhand cut and fill stoping

● 广西桂华成公司珊瑚矿高价值窄脉矿体开采

HIGH-VALUE NARROW VEIN OREBODY MINE OF GUANGXI GUIHUACHENG CORAL MINE



- 该矿为典型的急倾斜极薄矿脉，采用浅孔留矿法采矿
- 研发了相适应的浅孔采矿台车，主要用于撬毛、平场和凿岩
- 作业效率提升近2倍，同时有效减轻作业人员劳动强度，降低安全风险
- The mine is a typical steeply dipping and ultra-thin vein, mined by the shallow-hole shrinkage method
- A suitable shallow-hole mining jumbo has been developed, which is mainly used for scaling, site leveling and rock drilling
- The operation efficiency is increased by nearly 2 times, and the labor intensity of operators and safety risks are effectively reduced

● 近年典型工程业绩

TYPICAL PROJECT PERFORMANCE IN RECENT YEARS

序号 S/N	项目名称 PROJECT NAME	规模 SCALE	项目国别 COUNTRY	竣工时间 COMPLETION DATE
1	赞比亚卢安夏穆利亚希采矿(铜) Mulishi Mine in Luanshya, Zambia (Copper)	采剥总量3000万吨/年 Total mining and stripping volume: 30 million t/a	赞比亚卢安夏市 Luanshya, Zambia	2015年至今 2015-present
2	刚果(金)迪兹瓦铜钴矿采矿(铜) Deziwa Open-pit Copper Mine Project in DRC (Copper)	采剥总量2000万吨/年 Total mining and stripping volume: 20 million t/a	刚果(金)卢阿拉巴省科卢韦齐市 Kolwezi, Lualaba Province, DRC	2019年至今 2019-present
3	刚果(金)SICOMINES铜钴矿采矿(铜、钴) SICOMINES Copper-Cobalt Mine in DRC(Copper and Cobalt)	采剥总量1800万吨/年 Total mining and stripping volume: 18million t/a	刚果(金)加丹加省科卢韦齐市 Kolwezi, Katanga Province, DRC	2021年至今 2021-present
4	赞比亚巴鲁巴铜矿采矿(铜) Zambia Baluba Copper (Copper)	采剥总量1800万吨/年 Total mining and stripping volume: 18 million t/a	赞比亚铜带省卢安夏市 Luansha, Copperbelt Province, Zambia	2019年至今 2019-present
5	刚果(布)索瑞米铜铅锌矿(铜、铅、锌) Soremi Copper-Lead-Zinc Mine in the Republic of the Congo (Copper, Lead, and Zinc)	采剥总量700万吨/年 Total mining and stripping volume: 7 million t/a	刚果(布)布恩扎省卢泰泰市 Loutété, Bouenza, the Republic of the Congo	2018年至今 2018-present
6	新疆萨热克铜矿采矿(铜) Xinjiang Sareke Underground Mine (copper)	规模50万吨/年 Scale: 500kt/a	中国新疆喀什市 Kashgar, Xinjiang, China	2019年至今 2019-present
7	黄石中色大冶铜绿山矿采矿(铜) Mining and Production of Daye Tonglushan Mine of Zhongse	规模40万吨/年 Scale: 400kt/a	中国湖北省黄石市 Huangshi, Hubei Province, China	2016-2018年 2016-2018
8	河北金厂峪金矿采矿(金) Hebei Jinchangyu Gold Mine (Gold)	采剥总量600万吨/年 Total mining and stripping volume: 6 million t/a	中国河北省唐山市 Tangshan, Hebei Province, China	2016年
9	山东恒邦冶炼股份有限公司 腊子沟金矿采矿(金) Lazigou Gold Mine Mining Project of Shandong Humon Smelting Co., Ltd.	规模12万吨/年 Scale: 120kt/a	中国山东省烟台市 Yantai, Shandong Province, China	2022年
10	缅甸达贡山镍矿采矿(镍) Tagaung Taung Nickel Mine in Myanmar(Nickel, Luban Prize)	采剥总量500万吨/年 Total mining and stripping volume: 5 million t/a	缅甸曼德勒与实皆省交界处 Junction of Mandalay and Sagaing, Myanmar	2014年至今 2014-present
11	广西桂华成珊瑚矿高价值 窄脉矿体开采(钨) Underground Production and Mining of Guangxi Guihuacheng Coral Mine (tungsten)	规模36万吨/年 Scale: 360kt/a	中国广西省贺州市 Hezhou, Guangxi Province, China	2021年至今 2021-present
12	福能集团龙海市竹坑尾(花岗岩) 矿山开采(非金属矿) Longhai Zhukengwei (Granite) Mine of Fujian Energy Group (Non-metallic Minerals)	采剥总量1000万吨/年 Total mining and stripping volume: 10 million t/a	中国福建省漳州市 Zhangzhou, Fujian Province, China	2020年至今 2020-present

实力篇

STRENGTH



TALENT TEAMS

人才队伍

中国十五冶拥有一支专业技术门类齐全、经验丰富、具有开拓创新精神的技术队伍和管理团队，现有地质、测量、井建、采矿、选矿、尾矿等矿山专业工程师200余人。其中硕士及以上学历110余人，矿山设计人员110余人，矿山相关注册壹级建造师220余人，高级及以上工程师人员120余人，注册安全及爆破作业工程师50余人，为矿山业务发展提供坚实支撑。

公司近年来不断引进高端人员，大力开展社会招聘，面向社会公开招聘各类中高端人才，引进地质领域科研带头人、信息中心筹备组组长、矿山公司总工程师等一批博士。注重员工培训，强化校企合作，共建“研究生联合培养基地”，开展矿业等相关专业工程硕士联合培养。

15MCC has a technical and managerial team highly experienced across various professional technical fields and imbued with a pioneering and innovative spirit. Currently, it employs over 200 engineers specializing in disciplines such as geology, survey, well construction, mining, processing and tailings. Among the team, there are over 110 individuals with a master's degree or higher, over 110 mine design professionals, over 220 constructors specialized in mining, over 120 senior engineers or higher, over 50 certified safety and blasting operation engineers. They provide a strong foundation for the development of 15MCC's mining business.

In recent years, the company has continuously introduced high-end talents, vigorously carried out social recruitment, openly recruited all kinds of medium and high-end talents from the society, and brought in a number of doctors such as scientific research leaders in the field of geology, leader of the preparatory group of the information center, and chief engineers of the mining company. It pays attention to staff training, strengthens school-enterprise cooperation to jointly build a "joint postgraduate training base", and carries out joint training of engineering masters in mining and other related disciplines.

拥有一支适于自身施工特点的矿业工人队伍，采取自有班组、专业分包和劳务分包等模式灵活配置。加强自有技工队伍建设，拥有核心技术工人650人，爆破工、维修工、安全工、大型采矿设备操作人员等技工100人。国外露天采矿以属地分包及专业分包为主要用工模式，国内露天采矿以专业分包或劳务分包为主要用工模式，地下采矿以自有职工和公司外聘劳务人员方式组织生产，满足不同用工需求。

公司核心产业技工队伍稳定，技术工人和技能人员素质稳步提升、结构持续优化，技工持技能等级证比例不低于技工人数的85%；技能人才占技工人数的比例达到50%及以上，高技能人才占技能人才的比例达到25%。

15MCC also possesses a mining workforce tailored to its unique construction characteristics, which implements flexible staffing arrangements through a mix of in-house teams, discipline subcontracting, and labor subcontracting. It strengthens the team building of in-house skilled workers, including 650 personnel who hold core technical expertise, and 100 technicians such as blasters, maintenance workers, safety officers, and operators of large mining equipment. Overseas open-pit mining primarily employs local and discipline subcontracting as the primary employment modes, while domestic open-pit mining predominantly relies on discipline or labor subcontracting. Underground mining production utilizes in-house employees and external labor service personnel to meet different employment needs.

The company's core industry technician team is stable, the quality of technical workers and skilled personnel is steadily improved, and the structure of such workers and personnel is continuously optimized. The proportion of technicians holding skill level certificates is no less than 85% of the number of technicians; the proportion of skilled personnel in the number of technicians reaches 50% or more, and the proportion of high-skilled personnel in the number of skilled personnel reaches 25%.



TECHNOLOGICAL INNOVATION

科技创新

中国十五冶坚持创新引领、科技强企。加大研发平台建设，在省级企业技术中心的基础上，组建工程研究中心、数字化中心，与高校合办国家级研究中心，打造创新研究平台。加强研发人才建设，引进一批中高端科技人才，组建研发团队，大力开展科技创新研究。积极开展创新研究，在矿山领域围绕培育矿山综合解决能力，引入其他工程领域的新装备、新工艺、新材料、新技术，实施“集成创新”“跨界创新”，形成了一批可复制、可推广的应用研究成果。

15MCC is committed to innovation-driven leadership and strengthening through science and technology. It boosts its R&D platform efforts, sets up engineering research centers and digital centers based on provincial enterprise technology centers, and cooperates with universities in establishing national-level research centers, thereby building an innovation research platform. It strengthens the development of a R&D talent pool, introduces a number of mid-to-high-end scientific and technological talents, forms R&D teams, and vigorously pursues technological innovation studies. Actively engaged in innovation research, it focuses on developing capabilities in comprehensive mining solutions, incorporates new equipment, new processes, new materials and new technologies from other engineering fields, and implements "integrated innovation" and "cross-disciplinary innovation", thereby forming replicable application research achievements.

● TBM在金属矿山开拓工程中的应用

RESEARCH AND APPLICATION OF TBM IN METAL MINE DEVELOPMENT PROJECTS



TBM设备全景图
Panorama of tbm equipment



TBM始发
TBM launching



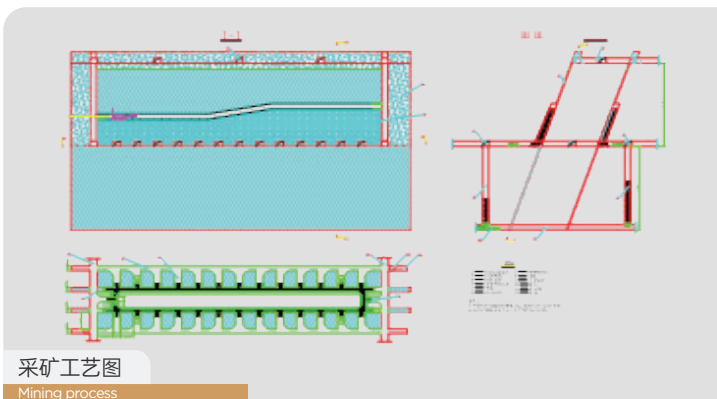
TBM施工巷道成型
Roadway formed by TBM construction

● 高价值窄脉矿体开采技术研究

TECHNOLOGIES FOR MINING HIGH-VALUE NARROW VEIN OREBODIES



小型多功能采矿台车
Small multifunction mining trolley



采矿工艺图
Mining process

● 矿山数字化管控运营平台

DIGITAL MINE CONTROL AND OPERATION PLATFORM



矿山综合管控平台
Integrated control platform for mines



固定设备自动化
Fixed equipment automation

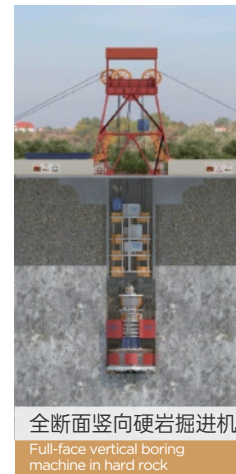
露天智能调度系统
Intelligent scheduling system for open-pit mines

井下设备远程操控
Remote control of downhole equipment

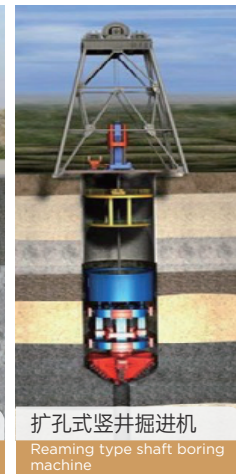


● 竖井掘进新装备的研究

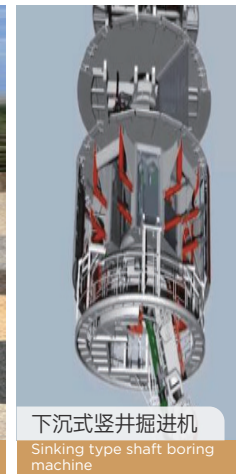
RESEARCH ON KEY TECHNOLOGIES FOR ULTRA-DEEP SHAFT CONSTRUCTION



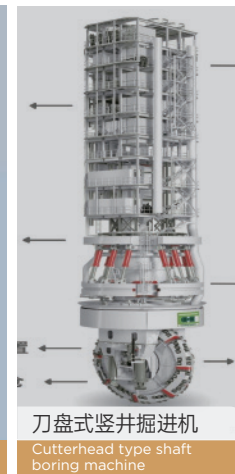
全断面竖向硬岩掘进机
Full-face vertical boring machine in hard rock



扩孔式竖井掘进机
Reaming type shaft boring machine



下沉式竖井掘进机
Sinking type shaft boring machine



刀盘式竖井掘进机
Cutterhead type shaft boring machine



地表工业大临布置
Surface industrial large-scale layout

地表工业大临布置
Layout of industrial large temporary facilities on the ground

● 金属矿山充填系统优化关键技术

KEY TECHNOLOGIES FOR OPTIMIZING FILLING SYSTEM OF METAL MINES
MINE FILLING SYSTEM OPTIMIZATION



充填站
Filling station



充填隔膜泵
Filling diaphragm pump

MECHANICAL EQUIPMENT

机械装备

中国十五冶拥有拥有各类矿山、工程机械设备4000余台套，原值8.5亿元，总功率22.78万KW，总重量2.26万吨，人均机械装备近25.3万元，人均装备动力超70KW。

15MCC owns diverse mechanical equipment for mining and construction, with over 4,000 sets valued at an original cost of RMB 850 million, a combined power output of 227,800 kilowatts (KW) and a total weight of 22,600 tons. The investment in mechanical equipment amounts to nearly RMB 253,000 per employee, with an average equipment power exceeding 70KW per person.

1 矿山装备精良 MINE WELL EQUIPPED

中国十五冶拥有牙轮钻机、凿岩台车、挖掘机、装载机、大型矿卡等矿山开采专用设备近450台套，创新性地引入TBM硬岩隧道掘进机用于矿山巷道掘进，能够为矿山开采提供全流程服务。

15MCC possesses nearly 450 sets of dedicated mining equipment, such as rotary drills, drill jumbos, excavators, loaders and large mining trucks. It innovatively introduced hard rock TBM for mine roadway excavation, offering full-process services for mining.



2 工程装备齐全 COMPLETE ENGINEERING EQUIPMENT

中国十五冶拥有大型起重设备250余台套，大型运输设备300余台套，土方机械100余台套，公路设备70余台套，钢筋混凝土设备200余台套，动力及焊接设备1300余台套，试验设备400余台套，满足矿山基建、选厂、尾矿库及相关配套建设等工程需要。

15MCC has an extensive array of equipment to meet various construction needs of mine capital construction, processing plant, TSF and related auxiliary projects. This includes over 250 sets of large lifting equipment, 300 sets of large transportation equipment, 100 sets of earthmoving machinery, 70 sets of highway equipment, 200 sets of reinforced concrete equipment, 1,300 sets of power and welding equipment and 400 sets of test equipment.



ESG

ESG代表“环境、社会、管治”，是一种关注企业环境影响、社会贡献、公司治理而非传统财务绩效的投资理念和企业评价标准，反映企业长期可持续发展的能力。中国十五冶通过加强ESG治理能力、构建系统的ESG体系能更好地实现可持续发展目标，更加全面地展示企业对环境和社会的贡献以及自身经营情况，并增强在全球市场的竞争力。

中国十五冶积极履行企业社会责任，促进公司可持续发展，落实公司环境、社会及管治（以下简称“ESG”）方面的工作，根据国务院国有资产监督管理委员会（以下简称“国资委”）相关要求，对标国内外主流ESG披露指引，制定了ESG管理手册，并发布了ESG报告。

ESG, which stands for "Environment, Society and governance", is an investment concept and enterprise evaluation standard that focuses on the environmental impact, social contribution and corporate governance of enterprises rather than traditional financial performance, reflecting the ability of enterprises to develop sustainably in the long term. By strengthening its ESG governance capacity and building a systematic ESG system, 15 MCC can better achieve sustainable development goals, more comprehensively demonstrate its contribution to the environment and society as well as its own business situation, and enhance its competitiveness in the global market.

15 MCC actively fulfills its corporate social responsibility, promotes its sustainable development, and implements its environmental, social and governance (hereinafter referred to as "ESG") work. According to the relevant requirements of the State-owned Assets Supervision and Administration Commission of the State Council (hereinafter referred to as "SASAC"), 15 MCC has benchmarking the guidelines for mainstream ESG disclosure at home and abroad, and has formulated an ESG management manual. And published the ESG report.



综合解决方案 INTEGRATED SOLUTIONS

中国十五冶致力于打造成为行业领先的矿山综合服务商，围绕“地、测、采、选、尾、修、数”全业务链，构建设计、咨询、投资、建设、采购、运营“六位一体”综合服务能力，积极探索“矿山+”商业模式，根据国内外不同矿山的实际情况，为矿山客户提供定制化的综合解决方案，助力实现矿山高质量可持续发展。

矿山综合解决方案是具有矿山全产业链业务的开发企业向矿山企业提供行业领先的全业务流程、全生命周期、多维度专业化服务的一揽子方案。

15MCC is committed to becoming an industry-leading comprehensive mine service provider in the industry. Focusing on the whole business chain of "geological exploration, reconnaissance, mining, mineral processing, tailings technology and application, ecological restoration, digital control platform", it has established the integrated service capacity of design, consultation, investment, construction, procurement, and operation. It is actively exploring the business mode of "mine +". It provides customized integrated solutions for mine customers according to the actual situation of different mines at home and abroad, thus helping the mines to achieve high-quality sustainable development.

The integrated solutions for mines represent a package of industry-leading specialized services that span the entire business process, life cycle and multiple dimensions. These are offered by development enterprises that operate across the entire mining industry chain to mining enterprises.

全业务流程涵盖

Coverage of the entire business process

地（地质勘查）、测（工程勘测）、采（采矿工程）、选（选矿工程）、尾（尾矿库、尾矿综合利用）、修（矿山生态修复）、数（数字化平台）七个环节。

Geological exploration, engineering survey, mining engineering, processing engineering, TSF & comprehensive utilization of tailings, mine ecological restoration, and digital platform.

全生命周期涵盖

Coverage of the life cycle

矿山的各发展阶段，包括拟开发矿山整体规划、研究；新矿山设计、建设；生产矿山本质安全、资源综合利用、提质增效、节能减排、生产运营等；老矿山转型升级、边深部找矿、环境综合治理等。

All development stages of mines, including the overall planning and research of mines to be developed; design and construction of new mines; intrinsic safety, comprehensive utilization of resources, quality and efficiency improvement, energy conservation and emission reduction, and production and operation of productive mines; transformation and upgrading, deep and side prospecting, and comprehensive environmental management of old mines.

多维度专业化服务涵盖

Coverage of multiple dimensions

设计、咨询、投资、建设、采购、运营等。

Design, consulting, investment, construction, procurement, operation, etc.

1 "地"—地质勘查 GEOLOGICAL EXPLORATION

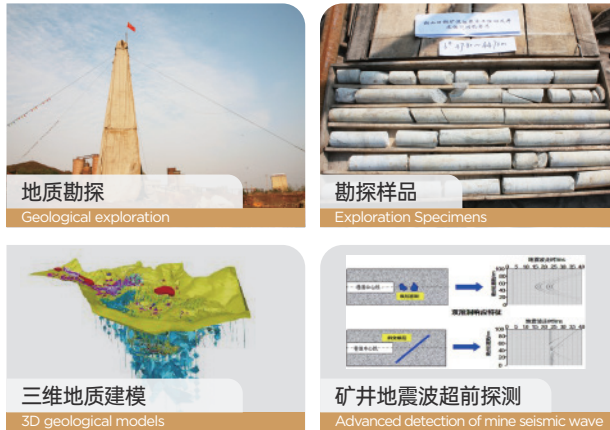
"地"既地质勘查；矿山地质勘查主要包括：地质找矿、工程地质、水文地质。
Mine geological exploration mainly includes: geological prospecting, geological and hydrogeological investigation.



● 地质找矿 GEOLOGICAL PROSPECTING



● 工程地质 GEOLOGICAL INVESTIGATION



2 "测"—工程勘测 RECONNAISSANCE

工程勘测是为查明建筑区内的地质地理环境特征及其他与工程建设相关的自然条件而进行的实地勘查和测绘工作。采用无人机测量技术、三维激光扫描技术、空间信息技术，矿山边坡稳性及地压在线监测，长距离井巷工程的贯通测量精度控制技术。

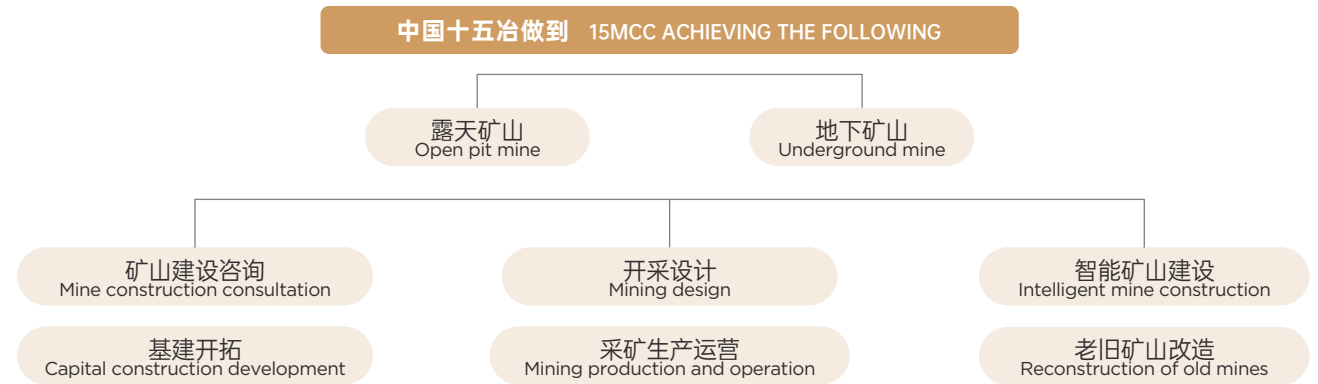
Reconnaissance includes field investigation and mapping work carried out to find out the geological and geographical environment characteristics in the construction area and other natural conditions related to engineering construction. UAV survey, 3D laser scanning, spatial information technology, online monitoring of mine slope stability and ground pressure, and breakthrough survey accuracy control technology for long-distance laneway works are adopted.



3 "采"—采矿工程 MINING

采矿分为露天开采、地下开采和露天转地下开采。应用露天境界外驻留矿体开采技术、大型露天矿山陡帮开采技术、矿山智能调度系统；深井开采技术、平巷与斜井TBM施工技术、地下矿山连续开采技术、高应力、软弱岩层综合支护技术、高价值窄脉矿开采技术、采掘设备自动化智能化应用。

Mining is divided into open-pit mining, underground mining and open-pit to underground mining. Apply mining technology of orebody residing outside the open pit limit, mining technology of large open pit steep slope and intelligent scheduling system of mine; deep mining, TBM construction for drift and inclined shaft, continuous mining for underground mine, comprehensive support technology for high stress and weak rock strata, mining technology for high-value narrow-vein mines, and automatic intelligent mining equipment.



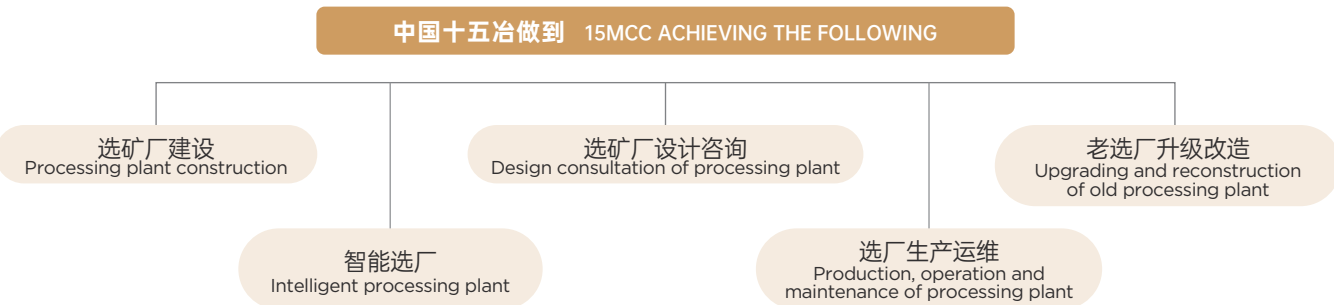
4 "选"—选矿工程 PROCESSING

选矿工程业务范围包括：选矿实验、工艺流程设计、选矿厂建设、选厂生产运维、老选厂升级改造。中国十五冶拥有70多年的选厂建设经验，取得多项工法和专利。

选矿主流技术有高效预选技术、矿石综合利用技术、高效节能碎磨工艺流程配置技术、大型选矿厂设备维保等技术。

The business scope of processing engineering includes processing experiment, process flow design, processing plant construction, processing plant production and O&M, and old processing plant upgrading. 15MCC has more than 70 years of experience in processing plant construction, and has obtained a number of construction methods and patents.

Mainstream processing technologies include high-efficiency pre-processing, comprehensive ore utilization, process configuration for high-efficiency and energy-saving crushing and grinding, equipment maintenance of large processing plants, etc.



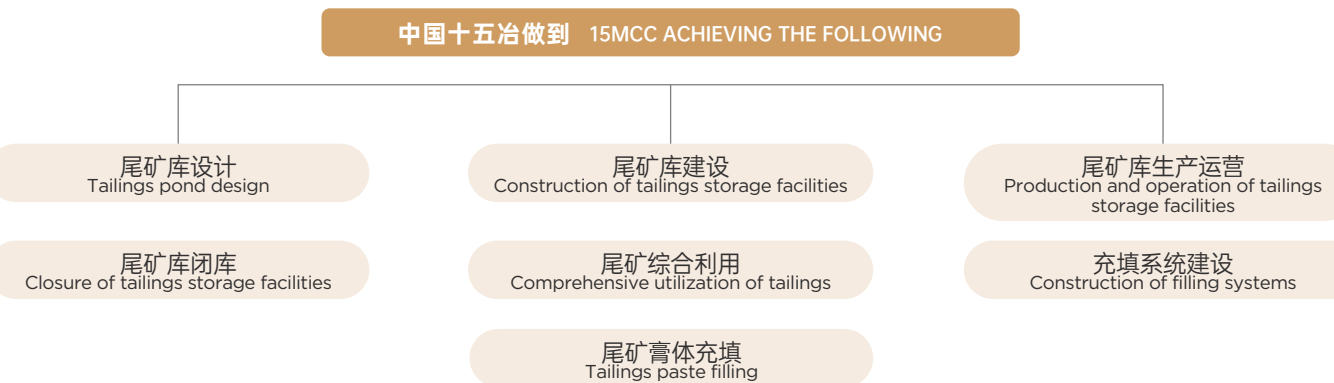
5 "尾"—尾矿技术与工程 TAILINGS TECHNOLOGY AND APPLICATION

尾矿工程业务主要包括：尾矿库建设、生产运营、闭库；尾矿综合利用，充填系统EPC承包及运营等。

尾矿综合利用技术：尾矿有价组分再选提纯技术、尾矿综合利用开发；尾矿一键膏体充填等技术。

The business scope of tailings works mainly includes TSF construction, production operation, and closure, comprehensive utilization of tailings, and EPC contracting and operation of filling system.

Tailings comprehensive utilization technology: re-cleaning and purification for valuable components of tailings, comprehensive utilization and development of tailings, one-key paste filling of tailings.



6 "修"—矿山生态修复 ECOLOGICAL RESTORATION

"修"即矿山生态修复，主要为解决矿山地质灾害和生态环境等问题。边坡采用削坡减载、系统锚固、生态复绿技术；矿山废弃地采用工程重构和生物重构相结合进行生态重建技术。

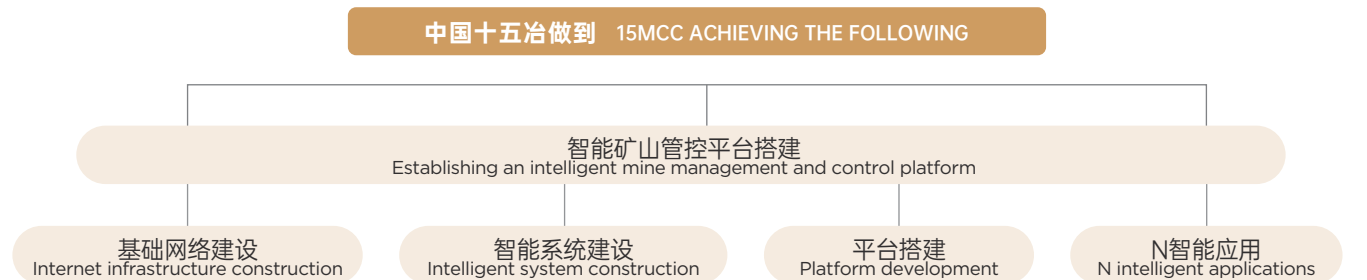
Mine ecological restoration mainly aims at addressing geological disasters and ecological environment issues in mines. Slope cutting and load reduction, systematic anchoring and ecological greening technologies are adopted for slopes; the combination of reconstruction and biological reconstruction is adopted for ecological reconstruction in mine wasteland.



7 "数"—数字化平台 DIGITAL CONTROL PLATFORM

矿山企业要进行数字化转型建设智能化矿山，建立综合管控平台（大数据平台），实现数据体系化、透明化展示，核心业务信息化全覆盖，围绕数据分析、数据决策、数据驱动三个维度，实现大数据移动化、数据化、智能化三统一。服务于矿山日常生产、经营、管理业务的需求。

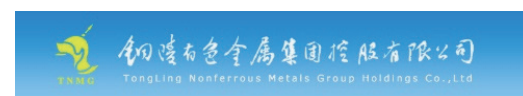
Mining enterprises should make digital transformation to build intelligent mines, establish a comprehensive management and control platform (big data platform), realize systematic and transparent display of data and full coverage of core business informatization, and unify big data mobility, digitization and intelligence around the three dimensions of data analysis, data decision-making and data driving to satisfy the needs of daily production, operation and management of mines.



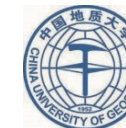
COOPERATOR ORGANIZATIONS

合作单位

1 合作伙伴 PARTNERS



2 高等院校 COLLEGES AND UNIVERSITIES



3 科研机构 SCIENTIFIC RESEARCH INSTITUTIONS



长沙矿冶研究院有限责任公司
CHANGSHA RESEARCH INSTITUTE OF MINING AND METALLURGY CO., LTD.



沈阳有色金属研究院有限公司
CNMC Shenyang Research Institute of Nonferrous Metals Co., Ltd.



兰州有色冶金设计研究院有限公司
Lanzhou Engineering & Research Institute of Nonferrous Metallurgy Co., Ltd.



长春黄金设计院有限公司
CHANGCHUN GOLD DESIGN INSTITUTE CO., LTD.



昆明有色冶金设计研究院股份公司
Kunming Engineering & Research Institute of Nonferrous Metallurgy Co., Ltd.

4 设备厂商 EQUIPMENT MANUFACTURERS

