

CONTENT目录

- **About Us 关于我们**
- Manufacturing Process 生产流程
- Product Development and Validation 产品开发及验证
- Forming Process 成型工艺
- Marketing 市场介绍

Shandong JC Metal Co., Ltd. also known as JC forged, which was founded in 2017, is a professional forged aluminum wheel and hub manufacturer.





Area: 200,000m²

Forging Production Lines: 6

Annual Production Capacity of Forgings:
2.4 million pcs

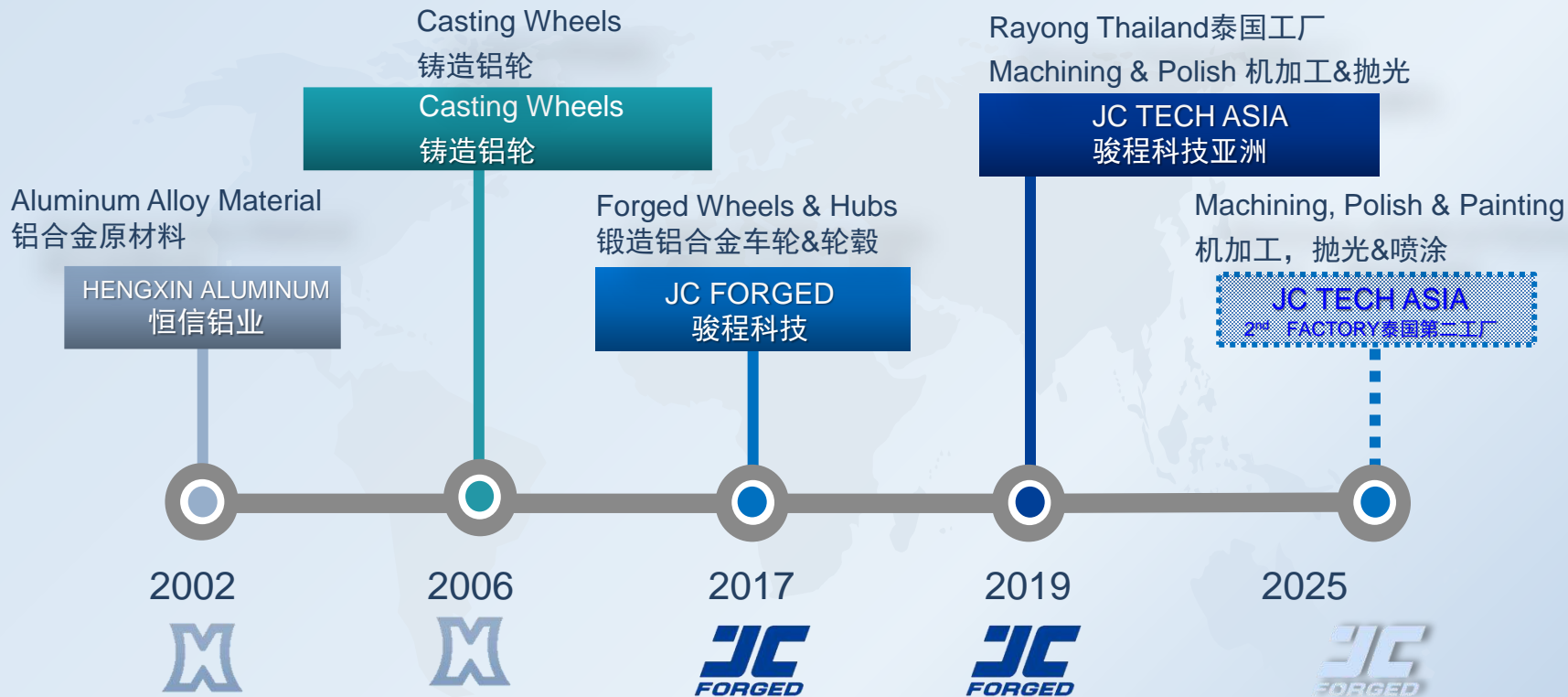
Annual Production Capacity of Finished
Forged Wheels: 1.6 million pcs

占地: 20万m²

锻造生产线: 6条

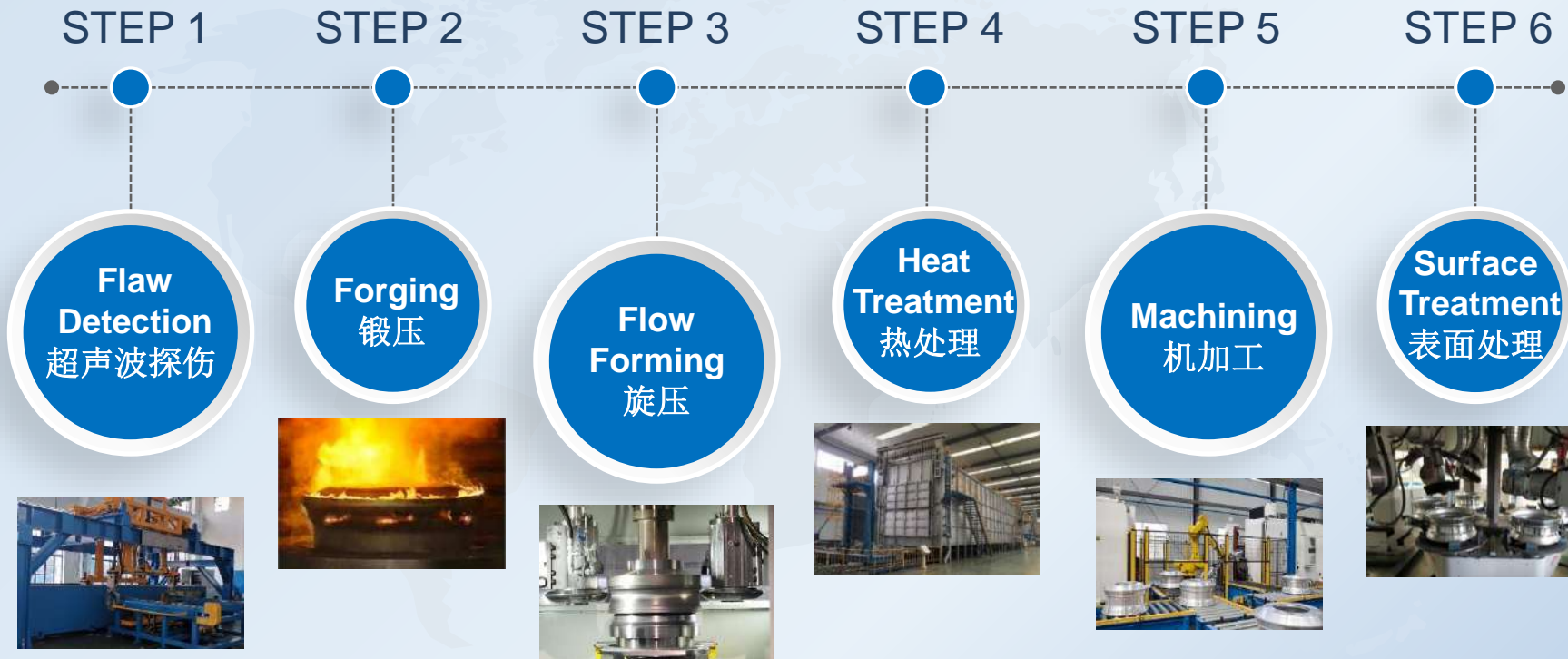
锻件年产能: 240万件

锻造车轮成品年产能: 160万件



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Main Equipment

主要生产设备

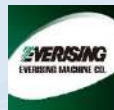
Name	Model	Brand	Year of Manufacture	Quantity
Saw-Cutting Machine 锯床	VG350	Everising Taiwan 台湾合济	2017	4
Pre-Heating Furnace 铝棒加热炉	NCL2017-1719	Nanjing Changjiang China 长炉	2017	4
Forging Press Machine 40M N 锻压机	THP11-4000D	Tianjin Tianduan China 天锻	2017	4
Forging Press Machine 100M N 锻压机	THP11-10000D	Tianjin Tianduan China 天锻	2017	4
Forging Press Machine 8M N 锻压机	THP11-800A	Tianjin Tianduan China 天锻	2017	4
Solution Furnace 固溶炉	NCL2017-1718	Nanjing Changjiang China 长炉	2017	4
Aging Furnace 时效炉	NCL2017-1718	Nanjing Changjiang China 长炉	2017	4
Flow Forming Machine 旋压机	VFM 800	WF Germany 德国WF	2017	5
CNC Lathe-Single Tool 单刀塔立车	PUMA V835	Doosan Korea 韩国斗山	2017	3
CNC Lathe Tool 卧车	PUMA AW660	Doosan Korea 韩国斗山	2017	16
CNC Lathe-Dual Tool 双刀头立车	PUMA VAW800	Doosan Korea 韩国斗山	2017	16
CNC Lathe-5 Axis 5轴加工中心	VARIAXIS i-800	Mazak Japan 日本马扎克	2017	8
Roller Burnishing Machine 滚压机	PS-CNCSXY	Prosper China 博赛	2019	4
CNC Polish Machine 抛光机	HP-1/1UT-CNC	Autopulit Spain 西班牙	2019	2
Transfer Robot 机械手	M-900IB/360	Fanuc Japan 日本发那科	2017	8
Transfer Robot 机械手	M-2000IB/210F	Fanuc Japan 日本发那科	2017	30
Wheel Cleaning System 清洗机	PTN-7000TF	Rishiboda China	2017	3
Laser Label System 打标机	LBGX-300	Wuhan Label Laser China	2017	2

Equipment in Forging Workshop

锻旋热车间设备



CNC Cutting System
CNC锯切系统



SINCE 1982

Brand 品牌	Everising Taiwan 台湾合济
Type 型号	VG350
Quantity 数量	4
Key Features 主要功能	Automatic length Automatic weighing 自动锯切、自动称重



Forging Press Machine
锻压机



1956

Brand 品牌	Tianduan Tianjin China 中国 天锻
Type 型号	THP11
Quantity 数量	4X3
Key Features 关键功能	800/4000/10000 Ton



Flow Forming Machine
旋压机

WF SENT 1859

Brand 品牌	WF Germany 德国WF
Type 型号	VAF800
Quantity 数量	8
Key Features 主要功能	40Ton pressure Largest in industry 行业最大压力40t



Heat Treatment Furnace
热处理炉

CHANGLU GROUP 1975

Brand 品牌	Changlu Nanjing China 中国长炉
Type 型号	NCL1718
Quantity 数量	4X2
Key Features 主要功能	Precision temperature control 温控精确



CNC Lathe-Bi-axial
车床

DOOSAN SINCE 1896

Brand 品牌	Doosan Korea 韩国斗山
Type 型号	AW800
Quantity 数量	60
Key Features 主要功能	Bi-axial 双刀塔



CNC Lathe-5 Axis
五轴加工中心

Mazak 1919

Brand 品牌	Mazak Japan 日本马扎克
Type、型 号	VARIAXIS i-800
Quantity 数量	8
Key Features 主要功能	5 axis 五轴联动



chiron SINCE 1921

Brand 品牌	Chiron Germany 德国巨浪
Type 型号	Mill 800
Quantity 数量	4
Key Features 主要功能	5 axis 五轴



Roller Burnishing Machine
滚压机



SINCE 1993

Brand 品牌	Prosper China 中国博赛
Type 型号	PS-CNCSXY
Quantity 数量	4
Key Features 主要功能	Automatic burnishing 自动滚压

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VIRTUAL VALIDATION

虚拟验证

- Structural Analysis(FEA) 结构分析
- Tooling Analysis 模流分析
- Data Analysis 数据分析
- Optimization 产品优化



PRODUCT DESIGN

产品设计

- Product Engineering 产品设计
- Tooling Engineering 模具设计

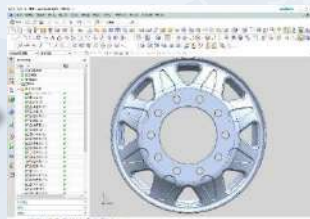
PROTOTYPE VALIDATION

样件验证

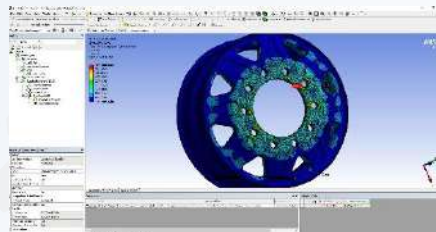
- Bench Test 台架实验
- Mechanical Property 性能检测



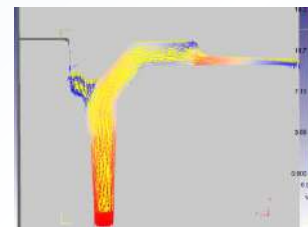
Concept Design
概念设计



3D Design
3D 设计



Structural Analysis
结构分析



Mould Flow Analysis
模流分析



Tooling Development
模具开发



Prototype
样件制作



Bench Test
台架实验

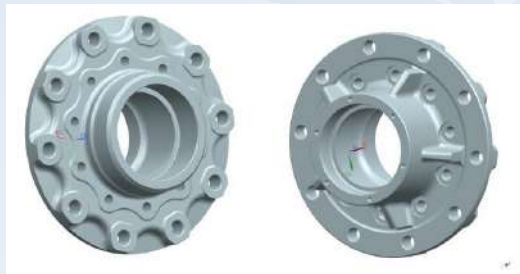


Vehicle Matching
装车匹配

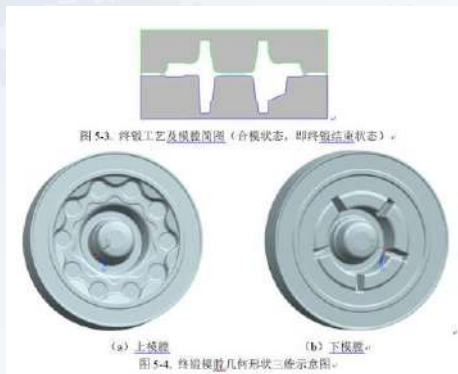
Replace steel hub , higher performance than USA product

替代铸铁轮毂，比美国品牌性能更好

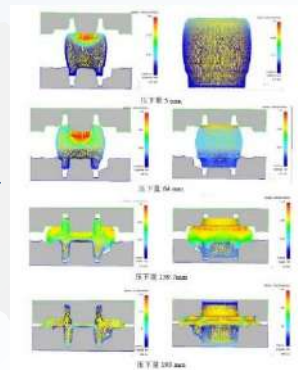
MAX LOAD最大载荷: 13t



Product Development
产品开发



Mold Development
模具开发



Mold Flow Analysis
模流分析



Forged Al hub
锻造铝轮毂样件



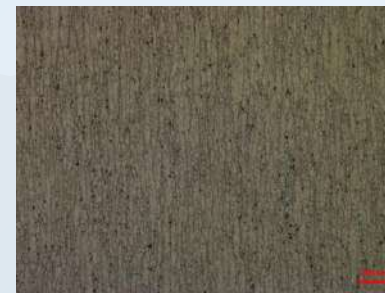
Patent
发明专利

Products 产品厂家	Material 材料	Production Method 生产工艺	Mechanical Property 机械性能			
			Spec	Tensile Strength 抗拉强度	Yield Strength 屈服强度	Elongation 延伸率
JC FORGED 骏程科技	6061	Closed-Die Forging 闭式锻造	Spec	≥ 310MPa	≥ 290MPa	≥9%
			Act.	354	321	10~18%
USA Brand 美国品牌	A356	Casting 铸造	Spec	≥ 260MPa	≥ 210MPa	≥3%
			Act.	275	225	5%

Developed Material-6061+
6061+铝合金



Microstructure of 6061
Alcoa 美铝车轮金相



Microstructure of 6061+
骏程车轮金相

New Material 新材料

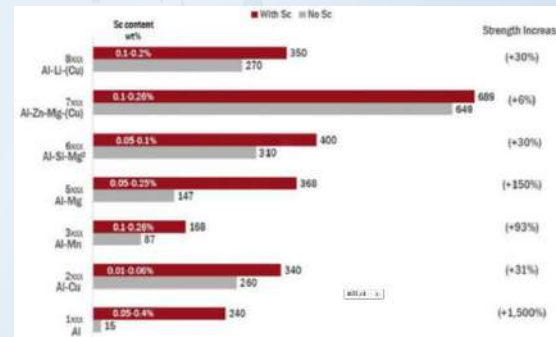


Aluminum-Scandium Alloy
铝钪合金

Grain Size晶粒度 <10μm

UTS抗拉强度 400 MPa

Elongation延伸率 >15%



Patent & Software copyright : 47pcs 专利 & 软著: 47 件





Radial Fatigue Testing
径向疲劳测试机



Bending Fatigue Testing
弯曲疲劳测试机



Impact Testing
冲击测试机



Spectrograph
(In Purchasing)
光谱仪



Three Coordinate Measuring
(In Purchasing)
三坐标



Universal Testing
万能材料试验机



Automatic
Ultrasonic Detector
全自动超声波探伤机



Optical Microscope
显微镜



Hardness Tester
硬度计



International Quality Management System Certificate
国际质量管理体系认证



International Environmental Management System Certificate
国际环境体系认证



International Automobile Trade Association Certificate
国际汽车行业认证



New High-Tech Enterprise
高新技术企业



JWL VIA Certificate Japan
日本JWL VIA认证



LBF Bi-axial Fatigue Test Report
LBF双轴疲劳测试认证报告



Smithers Corning & Radial Fatigue Test Report
史密斯弯曲&径向疲劳测试报告

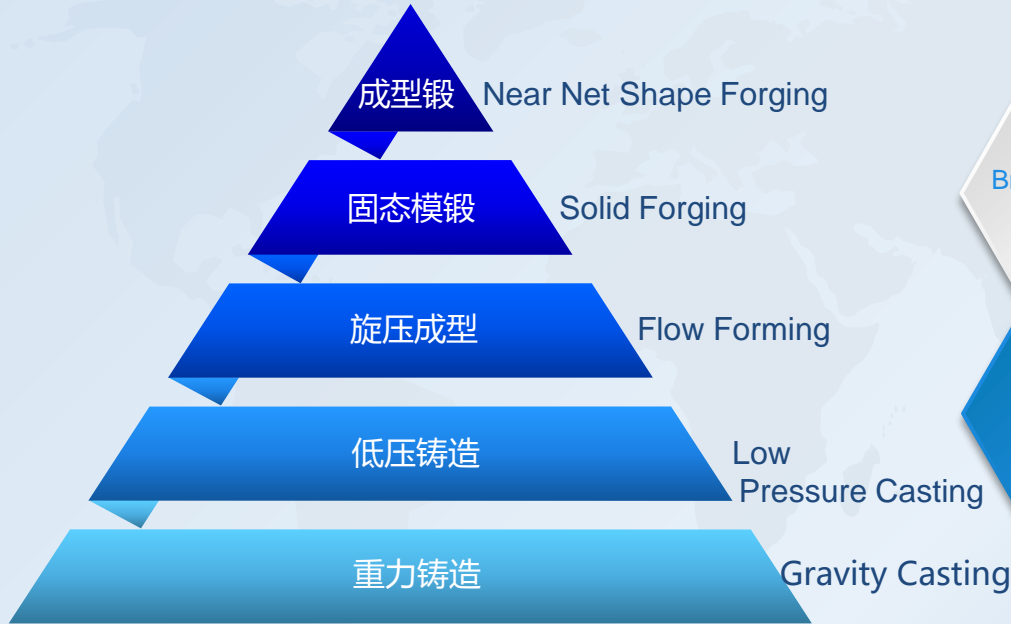


002673/2020
Brazil Inmetro Certificate
巴西Inmetro认证

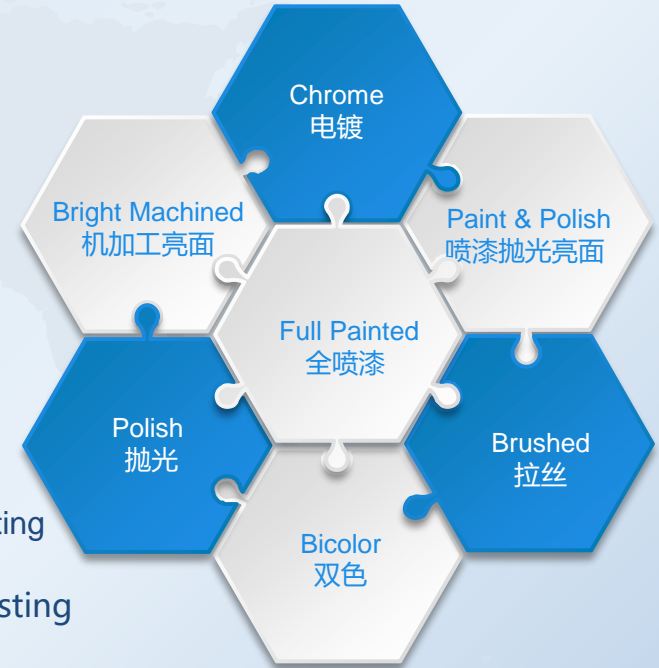
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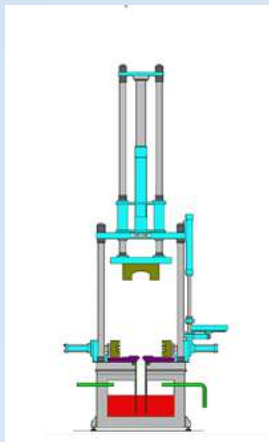
■ Forming Process 成型工艺



■ Surface Treatment Process 表面处理工艺



低压铸造原理图



Schematic Diagram of Low Pressure Casting

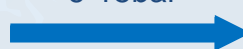


低压铸造
LPC



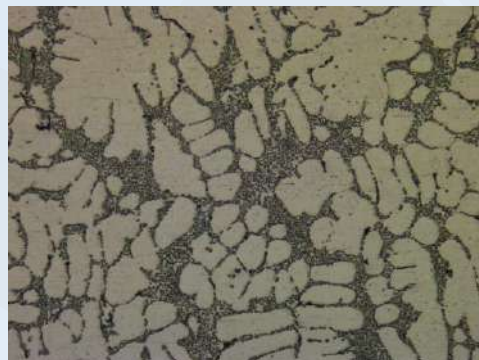
A356.2

6-15bar



车轮毛坯

Wheel Blank



100x

240-260MPa 抗拉强度 UTS

210-230MPa 屈服强度 YS

3-5% 延伸率 E

铸旋流程
Spinning Process



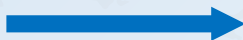
普通铸造毛坯轮辋 Casting Rim	旋压技术优势 Spinning Advantage	旋压后毛坯轮辋 Spinning Rim
	<p>← 240-260MPa 抗拉强度UTS → 280-300MPa</p> <p>← 3-5% 延伸率E → 7-10%</p> <p>← 4-5.5mm 轮辋厚度 Rim Thickness → 3.5-4.0mm</p>	

固态锻造
Solid Forging



6061铝合金棒
6061Al Billet

10000t



锻造毛坯
Forged Blank



Flow
Forming.mp4

普通
锻造

Standard
Forging



预锻
Pre-forging



终锻
Final Forging



扩孔切边
Trimming



旋压
Spinning



机加工
Machining

成型
锻造

Near Net
Shape
Forging



预锻1
Pre-forging



预锻1
Pre-forging



终锻
Final Forging



扩孔切边
Trimming



旋压
Spinning



机加工
Machining

Forging Process

锻造工艺

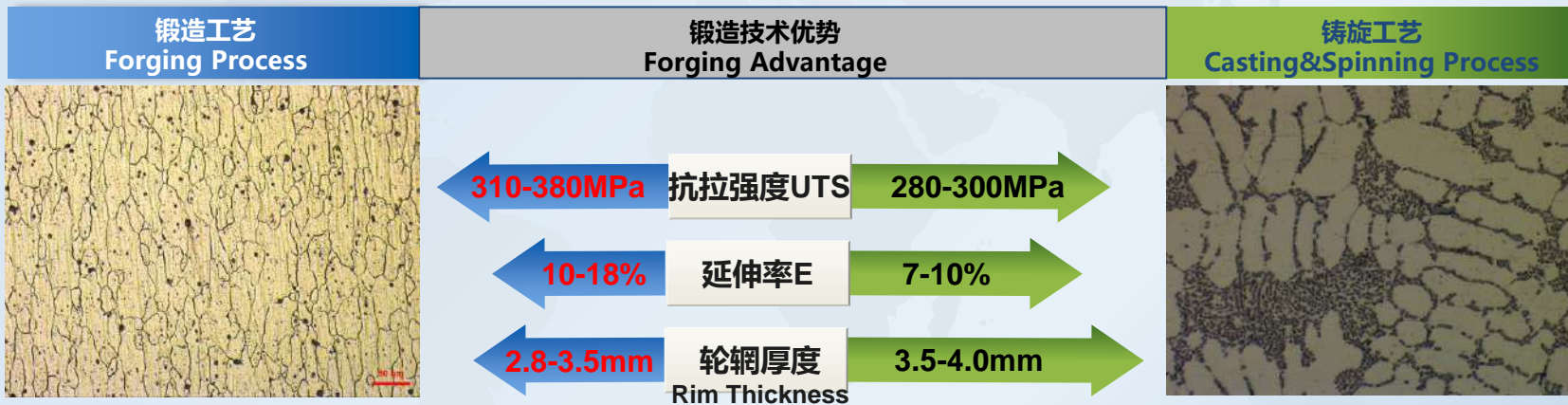
A356.2：铸造铝合金，Si含量高，铸造性能好，抗冲击性能差。

Casting aluminum alloy, good casting performance, poor impact resistance.

6061：变形铝合金，高强度，高韧性，抗冲击性能好。

Deformed aluminum alloy, high strength, high toughness, good impact resistance.

铸造、锻造化学成分对比 Comparison of chemical composition in casting and forging							
	Si%	Mg%	Cu%	Mn%	Ti%	Fe%	余量
A356.2	6.5-7.5	0.30-0.45	≤0.10	≤0.05	≤0.2	≤0.12	Al
6061	0.4-0.8	0.8-1.2	0.15-0.4	≤0.15	≤0.05	≤0.7	Al



- 锻造车轮抗冲击性能好，韧性高，适用于快速起步，扭矩大的电动汽车

The forged wheel has good impact resistance and high toughness, which is suitable for electric vehicles with fast start and large torque.

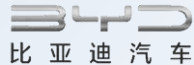
- 同一尺寸锻造车轮比铸造车轮轻20-30% Forged wheels are 20%-30% lighter than cast wheels of the same size.

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OEM-主机厂

After Market
零售客户



A faint, stylized world map is centered in the background, rendered in a light blue and yellowish-gold color scheme. The map shows the outlines of continents and major landmasses.

Thank You !