

CHONGQING YOUFU METAL PRODUCT CO.,LTD

重庆有孚金属材料有限公司

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FORGED PISTON PROJECT/锻造活塞项目

I、Company's Introduction/公司介绍

1. Introduction/公司简介

CHONGQING YOUFU METAL PRODUCT CO.,LTD was established in 2001. Ours research, manufacturing, and marketing around aluminum forging parts. The parts application include automotive industry, subway traffic industry etc. 重庆有孚金属材料有限公司成立于 2001 年，主要围绕铝合金锻造产品进行研究、生产、营销。涵盖领域主要包括汽车工业、交通运输、航空航天铝合金锻件的加工。

Since 2004, we start expand in forged piston project, the first business cooperation is VOLVO forged piston $\Phi 81\text{mm}$ to Europe market. We still supply this model to our clients every 3000pcs per year. Our forged piston raw material are high grade aluminum extrusion bar 4032, 2618. After years development, Youfu has already to be leader in closed die forging field in China.

Therefore, the aluminum forging piston has to be our company's new economic pillars since 2005.

从 2004 年，我们开始研究并生产锻造活塞，如 4032 锻造活塞、2618 锻造活塞。经过几年不断研究生产，封闭式锻造活塞加工技术，已处于行业领先地位，在目前大陆市场上，我们的锻造技术属于绝对的领先地位，而且经过了国际市场的检验。因而，铝合金锻造活塞已发展成为我司一个新的产业支柱点。

Not only our parts be approved by international buyer, also be attended by our China automotive research organization, such as China Automotive Engineering Research Institute, and China

Automotive Rebuild Insitute etc.According to their requirements, we supplied many sets sample for their inspection, we also has got good feedback.Therefore, our target is to be professional high performance manufacturer. Now, we are moving.

我们的产品不光受到国际买家的认可；在中国国内，也引起汽车相关部门（如：中国汽车研究院等）的注意。继而，我们提供了部分产品供应他们测试，得到了很好的回馈以及极大的肯定。因此,更加坚定了我们成为专业化锻造活塞生产企业的信心。

2、产品定位

- (1)、汽车改装：主要运用于汽车、摩托车、船艇的竞技运动中。专业性的汽摩赛事，以及业务汽车玩家。
- (2)、高性能轿车 OEM 部件。

II、Mainly Products are being made/主要在产产品

1. Forged piston &Forged piston Blank/锻造活塞或毛坯

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|---------------------------------------|-----------------|
| (1)、Φ102 Forged Piston , | 20000 pcs/year, |
| ① 、 Honda Motorcycle Forged Piston | 5000 Pcs/Year |
| ② 、 Yamaha Motorcycle Forged Piston | 5000 pcs/year |
| ③ 、 Suzuki Motorcycle Forged Piston | 5000 pcs/year |
| ④ 、 Kawasaki Motorcycle Forged Piston | 5000 pcs/year |
| (2)、Φ81 VOLVO Forged pistons | 3000 pcs/year |
| (3)、Φ81 FIAT 1.4Terbo Forged Piston | 2000 pcs/year |
| (4)、Φ85 KAWASAKI ATV Forged Piston | 2000 pcs/ year |
| (5)、Φ84.5 Sport Compact Forged piston | 2000 pcs/year |
| (6)、Φ87 Sport Compact Forged Piston | |

2. Other Aluminum Forging Parts/其他铝合金锻件产品

- (1)、Aluminum7075 Connecting Rods 7075 连杆
- (2)、Aluminum 7075 Wheel Bolts 7075 轮毂螺帽

III、Technology/技术

1.Material of Aluminum /材料

- (1) .High Grade Aluminum extrusion 4032 from SWA / 4032 挤压材
- (2) .High grade aluminum extrusion 2618 from SWA/ 2618 挤压材

2.Material Cutting/材料切割

- (1). Smooth Surface of be cutted sides./ 平滑的切割面
- (2).Same thickness of each Aluminum Pie/厚度均匀

3.Forging /锻造技术

- (1)、Piston blank design/ 活塞毛坯设计
 - ① 、Coordinate measuring/ 3 坐标测量
 - ② 、Piston blank 3D design/ 毛坯 3 维设计
- (2)、Precision Forging die(Forging Tooling)/精密锻造模具
 - ① 、Material is H13/ 材料 H13
 - ② 、3D-Design/ 3D 设计
 - ③ 、Surface Preparation: 氮化或者陶瓷技术
 - ④ 、Top Forging Die,Bottom Die/上模和下模
- (3)、Precision Forging/精密锻造
 - ① 、Closed Die Forging/ 闭合式锻造

4.Heat-treatment/热处理

- (1) 4032, Heat Treatment is T6, After process, The data as bellow:

Mechanical Properties of 4032 (4032机械性能)

Tensile Strength, Ultimate抗拉强度	370--380 MPa
Tensile Strength, Yield 屈服强度	310--320 MPa
Modulus of Elasticity弹力系数	79 GPa

Fatigue Endurance Limit 耐疲劳度	110 -120 MPa
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(2) If 2618 material. The heat treatment is T61

Mechanical Properties of 2618 (2618机械性能)

Tensile Strength, Ultimate 抗拉强度	430-440 MPa
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Tensile Strength, Yield 屈服强度	360-370 MPa
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Modulus of Elasticity 弹力系数	74 GPa
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Fatigue Endurance Limit 抗疲劳度	120-130 MPa
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5.Machining /精加工技术

IV、Equipments of Forging/锻造设备

1.500Ton Forging Equipments	500 吨锻压机
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2.1000Ton Forging Equipments	1000 吨锻压机
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V、Output & Delivery Time 产能和交货期

1. If One-Step Forging (one time forging process) / 一次成型

(1) 、 500—600 Pcs/Day ; 22 Day/Month ; 10000-13200 Pcs/Month

2. If Twice-Step Forging(twice forging process) / 两次成型

(1) 、 400—500 pcs/day ; 22day/month ; 8000—10000pcs/month

3. Delivery days is approximate within 35days.

VI、Quality Warranty/质量保证

1. Piston Blank's Quality Control / 活塞毛坯质量控制

(1) . Each working procedure control /各工序质量控制

① . 下料厚度均匀、表面平滑 Same thickness and Smooth surface.

② . 锻压时 ,保持模具和材料的温度恒定。 keep Same Temperature for forging die and for aluminum material when forging process .

③ . 热处理时 , 保持足够的时间和温度。 keep enough time and temprauate for heat treatment process.

④ .性能检测 keep same Mechanical Properties for all being inspected parts

- ⑤ .精整
- ⑥ .喷砂 Keep shot Blasting's thickness is same for all blank
- ⑦ .完检 Inspection before shipping
- ⑧ .包装 Inspection when packing

2.CNC-Machining's Quality Control / 精加工质量控制

keep weight balance $\pm 1g$ for each set /每组配重达到 1 克

VII、Developments Planning/发展规划

1. **Earlier Planning:** Making pistons according to drawings or samples; Renewal of Equipments ; Increase Output/前期

规划：来样加工、设备添置、扩大产能.

According to exclusive technical of Precision aluminum forging, and pertinency's expand in market. We have got succeed from international market. and now we are already mass-produce to our clients. Already exported to U.S.A, Southeast Asia, Europe etc. Currently, the cooperation models are: Making according to clients drawings and samples. The forged piston from $\Phi 55$ mm to $\Phi 102$ mm etc. Perhaps, we will finish the the making planning of 2010, planning quantity is 50000 pcs. Besides, Renewal of Equipments will increase the output in 2011, we estimate that will reach to 100000 to 150000 pcs/year. 根据铝合金精密锻造技术优势，以及针对性推广，现已取得阶段性的成功。从最开始的小批量试单，到目前已开始批量生产。产品已出口美国、东南亚、欧洲等地区。现阶段，合作模式主要是：来图纸、来样品加工。产品直径范围从 55mm 到 102mm 不等。在 2010 年有望完成预定的 5 万只销售计划；到 2011 年，新设备的添置，产能将会上升到 10-15 万只/年。

2. **Mid-Planning:** Improve design and products items; Expand in mainland market (Inner automotive market of China).

中期规划：逐步完善设计能力和产品类别；挖掘国内市场。

During mid-planning, we will increase our piston type that satisfy International market's needing. Not only international market, but also will expand in China aftermarket. So we estimate that our output will increase to 150000 to 250000 pcs per year. 在中期规划，会根据国际市场需求，逐步丰富产品品种。除了和国际买家进行深度合作之外，还会不断的挖掘国内汽车的后市场潜力，在将来中国汽摩竞技类运动中供应链中，占得先机。预计到 2012 或 2013 年产能将会达到 15-25 万只。

3. **The later stage planning:**Perfect design and piston types, to be a popular brand try our best. Keep the output 300,000pcs per year.后期规划：完善的设计能力和产品、创立品牌。

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