Cost Analysis of AL Extrusion for Target Units

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OBJECTIVES

- The customer's aluminum extrusion line needs to be relocated, and it is necessary to study the detailed production costs of the same type of leading enterprises, involving equipment, personnel, energy consumption, etc.

PROCESS

- Methodology
  - Establish EXCEL format of the primary research per client's needs
  - Conduct primary research by SMM's network
  - Cross check the key information by various sources
  - Edit the report and provide the presentation for client of the whole project team
- Sample Size
  - Extrusion producers (10)
- Project Time
  - 12 weeks

DELIVERABLES

- Cost breakdown analysis
  - Equipment: brand, number, unit price, shelf life
  - Labor: Staffing, salary, number of shifts
  - Energy: electricity, LNG
  - Auxiliary: Abrasives, metal powder etc.,
  - Yield rate
- Cost analysis by process technology
  - Smelting & extrusion
  - Powder coating & electrophoresis
  - Threading & packaging

Excel Data Package

Company Profile	
Basic Information	Company Name
	Established time
	Location
Production capacity	Aluminum profile production capacity in 2021, 10,000 tons
	Production capacity of mid-to-high-end door and window aluminum profiles in 2021 - total, 10,000 tons
	Production capacity of mid-to-high-end door and window aluminum profiles in 2021 - powder coating, 10,000 tons

1	Molten metal	
	xxx does not have a molten metal production line, and all aluminum rods are sourced from xxx	
	The average price of external mining and processing fees for aluminum rods in 2021, yuan/ton	

2	Extrusion	
	The overall layout and investment	Formul
	Total production line	
	Total equipment investment, 10,000 yuan	Single production line
	Extruder Specifications	
	600T extrusion machine production line quantity	
	600T extrusion machine single production line equipment investment, 10,000 yuan	The number of main eq
	1000T extrusion machine production line quantity	
	1000T extrusion machine single production line equipment investment, 10,000 yuan	The number of main eq
	1450T extrusion machine production line quantity	
	1450T extrusion machine single production line equipment investment, 10,000 yuan	The number of main equipment equipped with a single production line * unit price of equipment

The production cost		Formula
Total cost, yuan/ton		Equipment depreciation + labor + energy consumption + materials
Equipment maintainance, yuan/ton		Total equipment investment/yield rate/average service life of equipment/total production capacity
Labor, yuan/ton		Total number of production lines * number of shifts * number of people on a single line * per capita monthly sal
Energy, yuan/ton		(unit price of electricity*unit consumption+unit price of natural gas*unit consumption)/yield rate
Material, yuan/ton		A set of mold cost / a set of tonnage that can be extruded by a set of molds / yield

Layout of a single extrusion unit				
Equipment	Major equipment			
	Number of units equipped for a single production line			
	Equipment unit price, 10,000 yuan/set			
	Equipment supplier			
	Equipment service life, years			
	Note			
Labor	Staffing, people			
	Salary, yuan/month			
	Number of shifts			
Energy	Electricity, KWH/ton			
	Electricity unit price, yuan/KWH			
	Natural gas, m^3/ton			
	Unit price of natural gas, yuan/KWH			
Material	A set of mold cost, yuan			
	A set of dies can extrude tons, tons			
Yield rate				

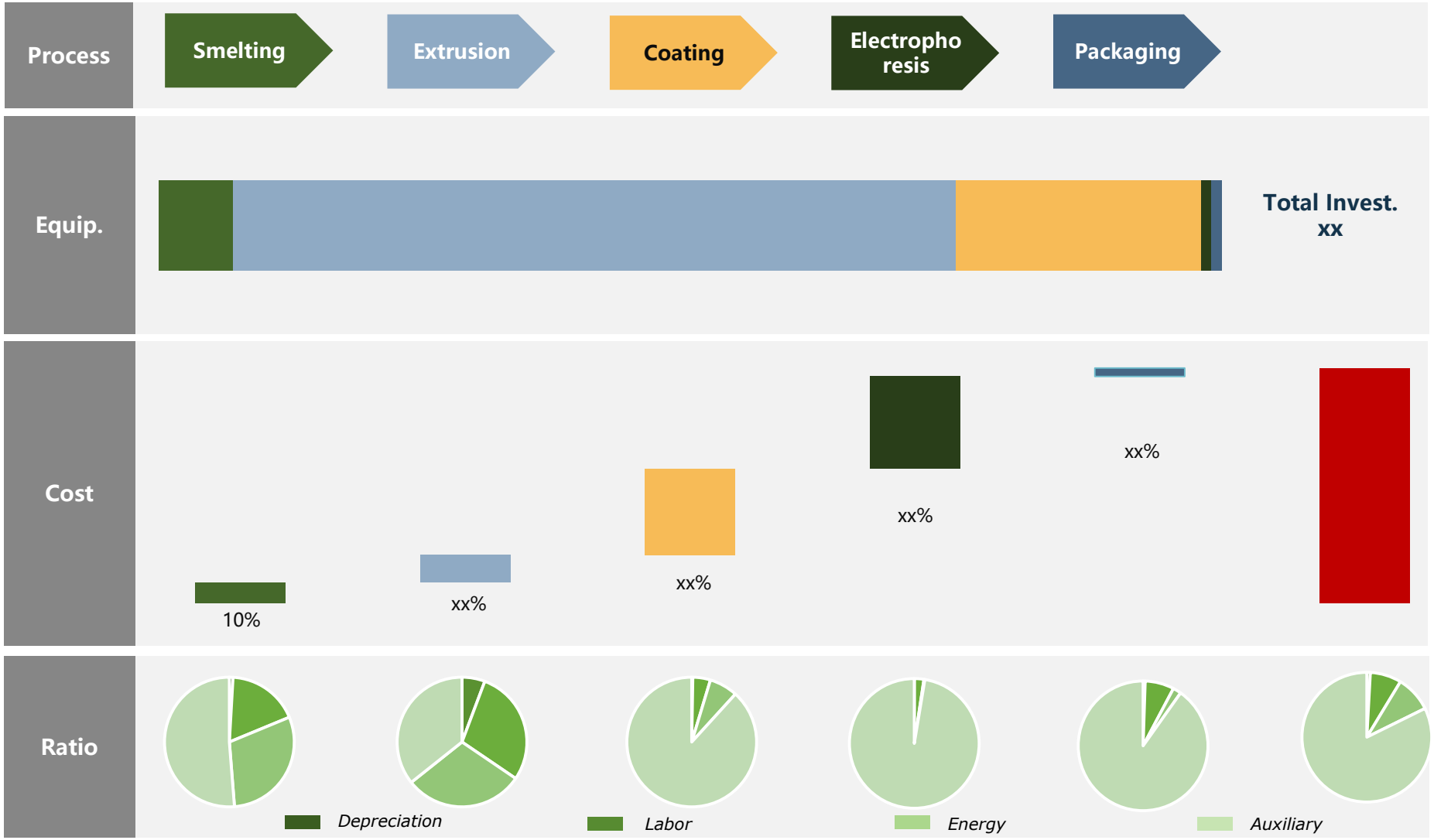
Source: SMM

Comparison within Target Al Extrusion Producer

Company \ Items	Total Capacity 0,000	Extrusion Capacity 0,000	Production 0,000	Cost		Feedstock Self Supply Ratio	Scrap ratio
				Coating	Electrophoresis		
A				3550	5850		xx%
B				3289	5561		xx%
C				3810	5900		xx%
D				3900	5700		xx%
E				3750	5650		xx%
F				3798	5514		xx%
G				3800	5800		xx%
H				3900	5750		xx%
J				3800	5850		xx%
K				3757	5478		xx%

Source: SMM

Cost Analysis-Total

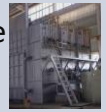


From the perspective of investment in each link, the extrusion link is the most important link, and its investment accounts for as much as xx%, followed by the powder spraying link, accounting for xx% of the total investment. Compared with other links, the investment in casting is relatively small, only xx %; threading and packaging each account for xx%

From the point of view of the production cost of each link, the cost of threading and powder coating accounts for the highest proportion, mainly due to the high cost of Auxiliary

Source: SMM

Cost Analysis-Smelting

Salary	Xx-xx RMB/worker/month				**Three shifts**
No. of worker	*3	*2	*2		
Equip.	Melting furnace *2 	Casting machine *1 	Holding furnace *1 	Homogenizing Furnace *1 	 *Fried gray machine*1* *Nitrogen generator*1*
Unit price	80-150	Xx-xx	Xx-xx	Xx-xx	Xx-xx
Supplier	xx	xx	xx		xx
Equip. Investment share	Melting furnace	casting machine	holding furnace	Homogenizing...	Other

Total Invest. xx

Electricity kwh/t	
LNG m^3/t	

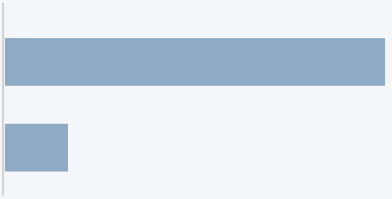
Auxiliary	Silicon, copper, iron, manganese, magnesium, chromium
Grade	6060，6063
Unit consump.	xx

- 1 casting machine generally needs to be equipped with 2 melting furnaces, the purpose is to improve production efficiency and avoid casting machine idle capacity
- There are 9 people in one class in the casting workshop, mainly in Melting furnace, casting machine, holding furnace and Homogenizing Furnace, etc.

Source: SMM

Cost Analysis-Extrusion

Salary	Xx-xx RMB/worker/month				**Two shifts**
No. of worker					
Equip.	Aluminum Rod Heating Furnace *1 	Mold Heating Furnace *2 	Extrusion machine *1 	Rear equipment *1 	Aging furnace *1 
Unit price	20-30	Xx-xx	Xx-xx	Xx-xx	Xx-xx
Supplier	xx	xx	xx	xx	xx
Equip. Investment share					**Total Invest. xx**



Auxiliary	mold
Supplier	1) Own mold factory; 2) Outsourcing
Unit consumpt.	A set of molds can extrude 6.5~8t profiles

- The main equipment in the extrusion link is aluminum rod heating furnace, mold heating furnace, extrusion machine, rear equipment and aging furnace
- 1 extrusion generally needs to be matched with 2 mold furnaces, and other equipment is configured at a ratio of 1:1
- There are 6 people in one shift in the extrusion workshop, and the number of people will vary according to the tonnage of the extrusion machine, with a maximum of 6 people

Source: SMM

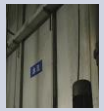
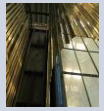
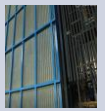
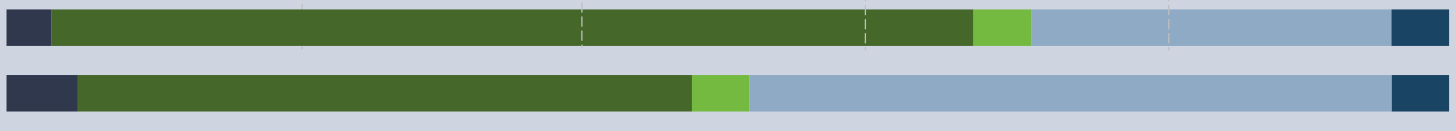
Extrusion Equipment

	Small extrusion machine	Medium extrusion machine	Large and medium extrusion machines
			
Tonnage	600T、800T	1000T、1500T	1800T、2000T
Quantity	4	10	4

- The tonnage of aluminum profile extrusion machines for mid-to-high-end systems is usually below 2000T, and the mainstream tonnages include 600T, 800T, 1000T, 1500T, 1800T, 2000T, etc.
- The ratio of the small, medium and large t positions of the extrusion machine is ideally 4:10:4. In the future, with the development of mold technology, more than one output can be realized, and the degree of automation is getting higher and higher, and the medium and large t position extrusion machines Less labor, high output, and high efficiency, so the number of extrusion machines with medium and large t positions will increase

Source: SMM

Cost Analysis-Coating

Salary	Xx-xx RMB/worker/month					**Two shifts**
No. of worker	*6~9		0		*2	0
Equipment	Chain up and down *1 	Pre treatment *1 	Drying furnace *1 	Spraying Equipment - Spray Gun *Vertical *48~60 Horizontal *18~20* 	Spraying equipment – powder *Vertical*2 Horizontal*1* 	curing oven *1 
Unit price	15-20	Xx-xx	Xx-xx	Vertical：Xx-xx Horizontal：Xx-xx	Vertical：Xx-xx Horizontal：Xx-xx	Xx-xx
Supplier	xx	xx	xx	xx	xx	xx
Equip. Investment share						**Horizontal xx Vertical xx**

Horizontal Electricity，kwh/t	
Vertical Electricity，kwh/t	
Horizontal LNG，m^3/t	
Vertical LNG，m^3/t	

Auxiliary	Metal powder
Supplier	xx
Unit consumption	40-50 kg/t

- A vertical single production line needs to be equipped with 2 powder booths, and each powder booth has about 24 spray guns. The horizontal line needs to be equipped with 1 powder room and 18-20 spray guns
- The vertical line has a high degree of automation, with about 13-16 people in one line and 16-18 people in the horizontal line. Personnel are mainly concentrated in the upper and lower processes

Source: SMM

Cost Analysis-Electrophoresis

Salary	Xx-xx RMB/worker/month				**Two shifts**
No. of worker	*15				
Equipment	Gear opening machine *1		Threading machine *1		Roller Press *1	
Unit price	15-20				
Supplier	xx				
Equip. Investment share					**Total Invest. xx**

Electricity kwh/t	

Auxiliary	Insulation strip
Supplier	xx
Unit consumption	650-670 m/t

- The main equipment supplier is Vangels, and the whole set of strip threading equipment is supplied by the same supplier
- 1 threading line generally needs to be equipped with 1 gear cutting machine, 1 threading machine and 1 roller press

Source: SMM

Cost Analysis-Packaging

Salary	Xx-xx RMB/worker/month	**Two shifts**
No. of worker		
Equipment	Automatic packaging machine *1  Ordinary packaging machine *1 	
Unit price	Automatic packaging machine Xx-xx Ordinary packaging machine Xx-xx	
Supplier	xx	

Automatic Electricity，kwh/t	
Ordinary Electricity，kwh/t	

Auxiliary	Pearl cotton	Straight wrap
Supplier	xx	xx
Unit price	6-8 rmb/kg	5-7 rmb/kg

- Packaging machines are divided into automatic packaging machines and ordinary packaging machines. The investment of automatic packaging machines is much higher than that of ordinary packaging machines.
- 1 packaging line generally needs to be equipped with 1 ordinary packaging machine or 1 automatic packaging machine

Source: SMM