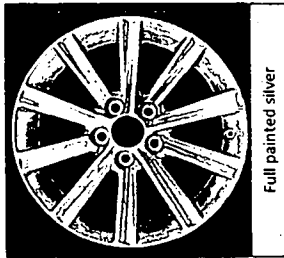
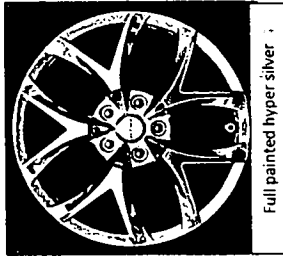


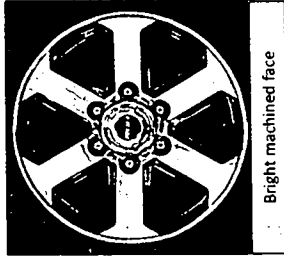
Making ARWs



Full painted silver



Full painted hyper silver



Bright machined face

Presented by ROH Automotive, Wednesday 15 February 2012.

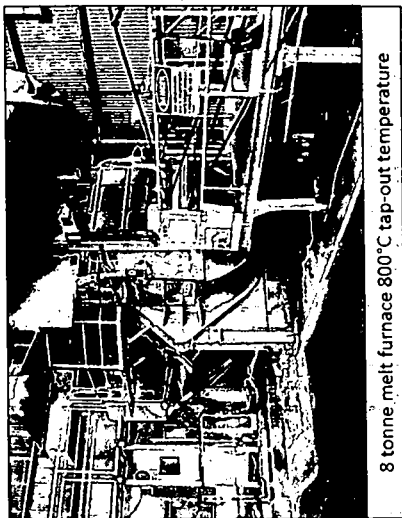
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FILE 214

Melt shop

250kg bag of silicon
rocks sitting on top
of five 300kg
aluminium ingots.



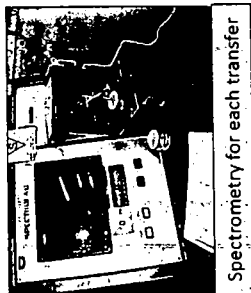
Aluminium ingot, silicon
rocks, titanium,
strontium & magnesium.



8 tonne melt furnace 800°C tap-out temperature



1,500kg transfer ladle

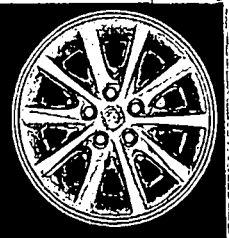
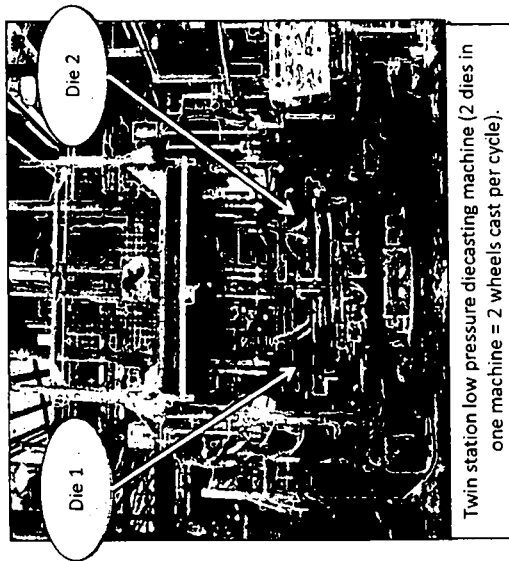


Spectrometry for each transfer

Low
pressure
diecasting
machines

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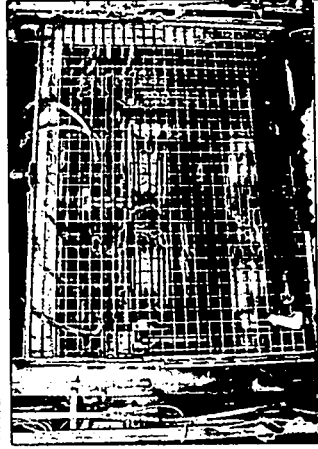
Low pressure diecasting



As-cast wheel (raw state).



Open dies showing top and bottom cores and rim slides.

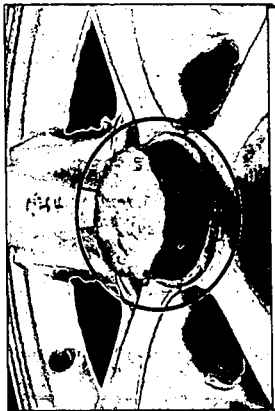


Showing two castings from the two dies.

Fettling and sprue removal



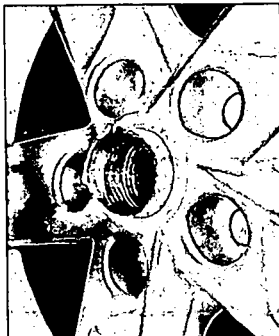
Mechanical fettling for cosmetic appearance.



Centre sprue (riser) to be removed.

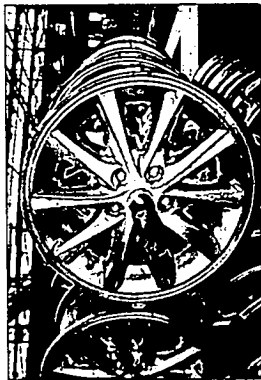


Robot drilling cell for sprue removal.

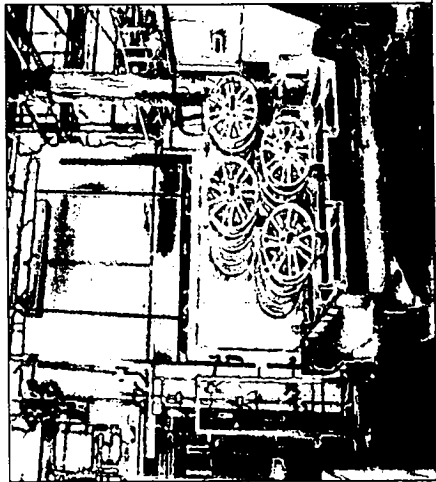


Casting with sprue drilled out.

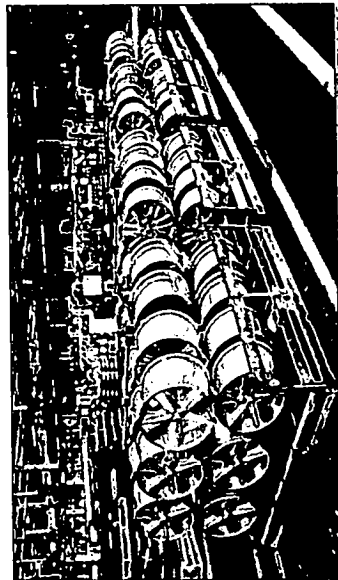
Continuous solution heat treatment & artificial ageing (tempering)



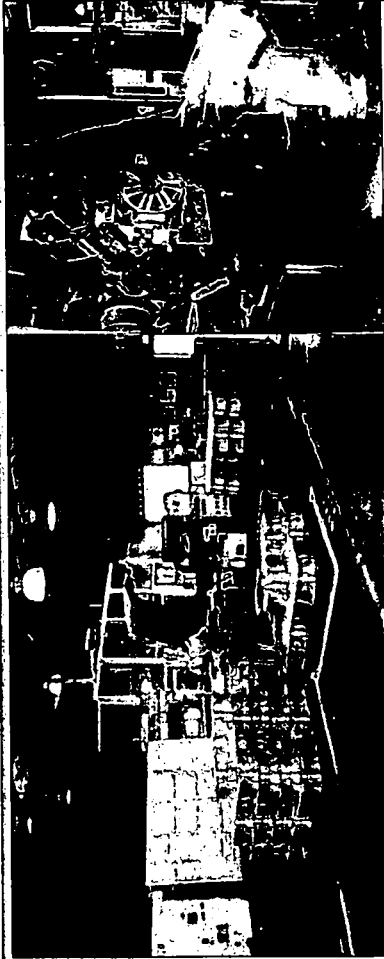
Desprued castings loaded onto heat treatment carriers (trolleys).



Heat treatment inside a solution oven is followed by quenching and to bring the castings up to the correct mechanical hardness and temper. The correct temper for ARWs is T6, hence the alternative term "T6 aluminium".



Machining



Robotic machining cells

- The five machining operations are :
1. Machine the outside rear of the wheel and the inside surfaces ;
 2. Drill and deburr the valve hole ;
 3. Drill the wheel stud holes ;
 4. Deburr the wheel stud holes ;
 5. Machine the outside front of the wheel.

- The five machining operations are followed by :
6. Rinsing the wheel to remove all swarf ;
 7. Leak test - mandatory for all wheels ;
 8. Deburr the back of spoke areas following machining;
 9. On-line wheel balance test performed for OEM customers.

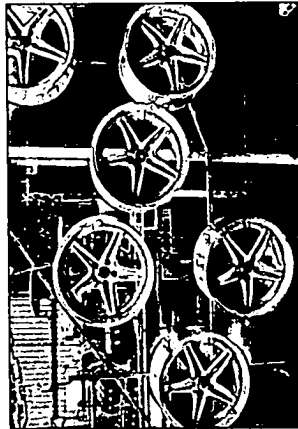
Cleaning, surface pretreatment & painting



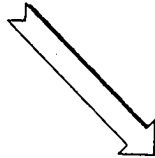
Machined castings ready to be loaded to paintline for cleaning, pre-treatment & painting.



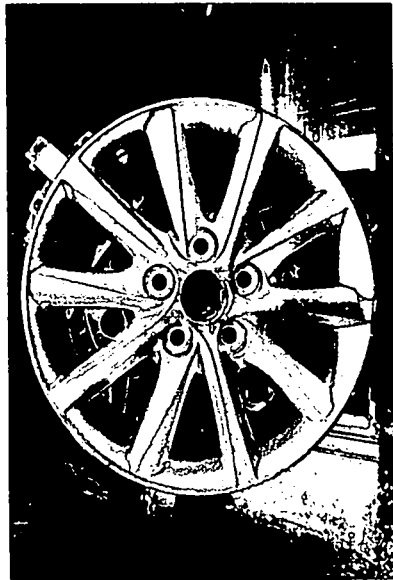
Robotic powder coating, colour coating and clear lacquer coating on continuous conveyor line.



Finished wheel awaiting inspection & packaging.



Optional machined face finish



Used in both OEM and Aftermarket applications, bright machined finish exposes the bright aluminium surface which contrasts with the painted surfaces.

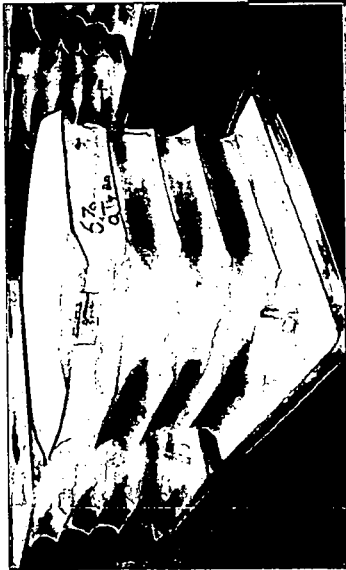
Following the first cleaning / pre-treatment & painting operation, the wheel is re-machined to remove paint from the desired surfaces. Following re-machining the wheel is then cleaned, pre-treated and painted for a second time. This process involves additional material and energy costs and (where applicable) additional labour cost.



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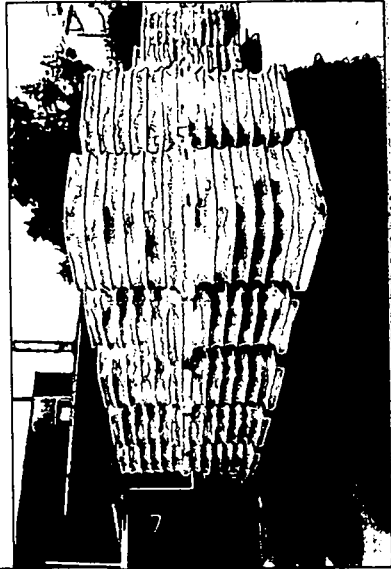
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OEM packaging



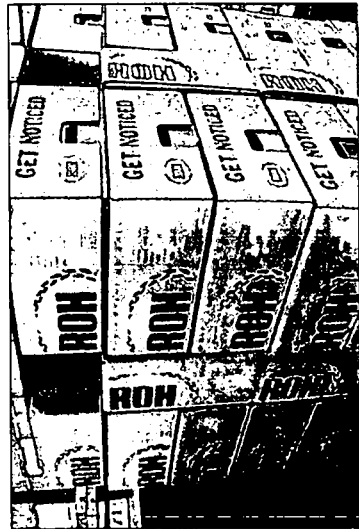
*Export OEM wheels might be packed with plastic,
rather than cardboard layer pads.*

*OEM wheels are packed bulk on pallets without
cardboard boxes and typically without accessory
items which include wheel caps and wheel nuts.*



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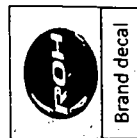
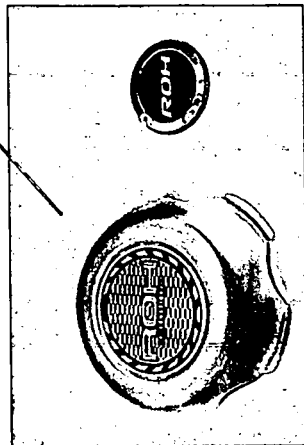
Aftermarket packaging



For aftermarket sales, wheels are individually cartoned.

Wheel caps (and optionally 4, 5 or 6 wheel nuts), are included with each wheel inside each carton.

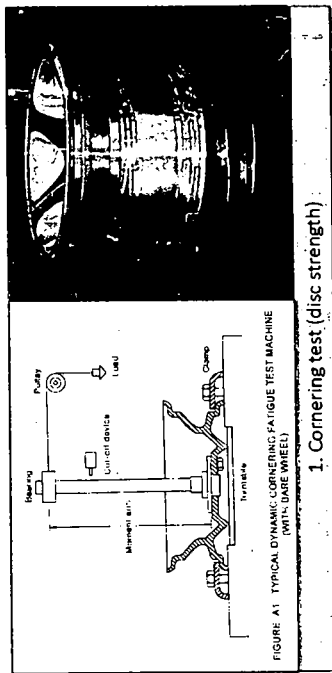
Caps are supplied with brand decals.



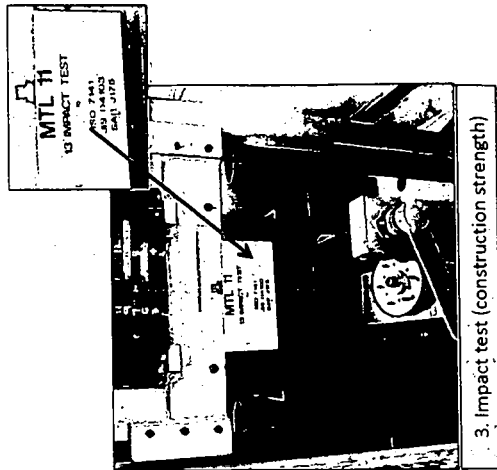
Australian Standard
AS1638 or equivalent.

Certification

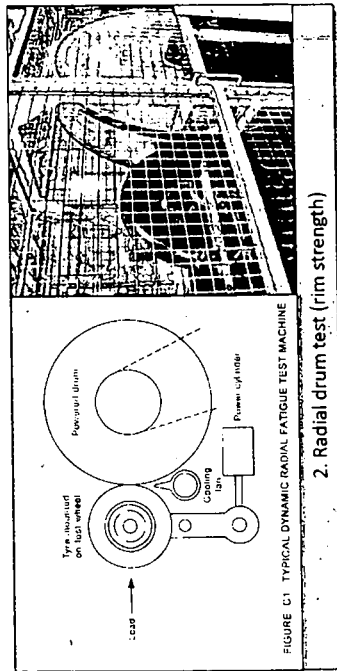
AS1638 may be
"enhanced" by OEMs.



1. Cornering test (disc strength)



3. Impact test (construction strength)



2. Radial drum test (rim strength)

AS1638 minimum test cycles:

Cornering : 100,000

Radial : 500,000

Impact load :

Determined by vehicle load.

Normal value calculator

ARW size	Average FOB price US\$	Constructed Normal Value US\$	Value of dumping US\$	Dumping margin
14"	\$29.17	\$47.99	\$19.82	70.36%
15"	\$36.00	\$69.07	\$33.07	91.86%
16"	\$41.44	\$82.56	\$41.12	99.23%
17"	\$48.75	\$100.72	\$51.97	106.61%
18"	\$57.08	\$132.87	\$75.79	132.78%
19"	\$63.33	\$136.21	\$72.88	115.08%
20"	\$73.79	\$150.18	\$76.39	103.52%
22"	\$91.92	\$185.28	\$93.36	101.57%

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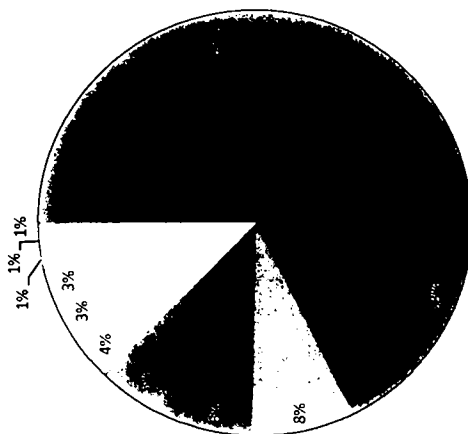
Basic facts

- Cycle times and output rates for diecasting, heat treatment and machining are globally similar ;
- Diecasting is limited to finite speed otherwise die-fill and turbulence rejects occur ;
- Die cooling with air and water to accelerate solidification can only commence at a finite time in the casting cycle for a specific duration – see pages 14~18 ;
- Low pressure diecasting (LPDC) represents a productivity gain over gravity diecasting ;
- Gravity die castings are more susceptible to cosmetic & mechanical defects ;
- Solution heat treatment and ageing can only occur at a set speed to achieve the correct T6 temper ;
- Surface machining can only occur at a maximum speed (feed rate) that does not burn the cutting tips and that provides the correct mechanical and cosmetic surface finish ;
- Casting, machining and painting yields (i.e. % rework & % scrap) are critical ;
- *Higher capital expenditures (and depreciation) can account for noticeable differences in output rates.*
- *For example, flow-forming the rim section can save around 1kg of aluminium for 17" ARW (e.g.) but requires additional processes and high capital outlay – not prevalent ;*
- *Forging is another method but it has very high capital outlay, limited front face styling flexibility and market appeal is also limited due to cost.*

Typical cost elements

Typical ROH ARW cost elements

- | | | | |
|--|---|--|---|
| ☐ Alloyed aluminium | ☐ Labour incl. on-costs | ☐ Other processing supplies | ☐ Selling & Administration |
| ☐ Paint | ☐ Electricity | ☐ Gas | ☐ Depreciation |
| ☐ Casting supplies | ☐ Cutting/polishing supplies | ☐ Distribution | |



Cost share will vary according to size, weight & finish.

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ROH SOP for diecasting ARWs

Gravity output rates = forced air-cooled dies.

LPDC output rates = forced air-&-water-cooled dies.

		Output per hour	
		Average shot-to-shot (seconds)	
Gravity	14"		Single
	15"		Twin
	16"		
	17"		
	18"		
Low Pressure (LPDC)	14"		
	15"		
	16"		
	17"		
	18"		
	19"		
	20"		

See ROH normal value calculator, Confidential Attachment B-4.1.16

Other cycle times & output rates

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Typical cycle times (seconds)	14"	15"	16"	17"	18"	19"	20"
Heat treatment							
Machining							
Painting							
Re-machining for machined face							
Packing OEM							
Packing AM							

Typical output rates (pcs/hour)	14"	15"	16"	17"	18"	19"	20"
Heat treatment							
Machining							
Painting							
Remachining (machined face)							
Packing OEM							
Packing AM							

See ROH normal value calculator, Confidential Attachment B-4.1.16

Main ingredients

1. Electricity ;
2. Natural gas ;
3. Pure aluminium ingot and alloying materials or A365.2 pre-alloyed aluminium ;
4. Fluxing compounds, nitrogen, metal filters ;
5. Fettling consumables ;
6. Cutting tips and cutting fluids ;
7. Cleaners and surface conditioners ;
8. Undercoat paint (typically powder coat paint) ;
9. Colour coat paint (typically solvent stoving enamels) ;
10. Clear lacquer paints (typically solvent based) ;
11. Packaging ;
12. Labour ;
13. Metal dies ;
14. Capital plant.

Aluminium, energy, capital depreciation, paint & labour are the major cost elements.

Yield (rework & scrap) also plays a major role in determining cost & profitability.

Electricity accounts for 7.6% of alumina production cost and 33.7% of primary aluminium production cost in China.

Electricity

The country is effectively exporting subsidised electricity through its aluminium exports.

Price of Electricity - Anovcrest research in China, 7 May 2010.

Unit Price: RMB/KWH

1 Qinhuangdao Economic and Technological Development Zone, Hebei (QETDZ), Provider: "Power Bureau".

CITIC Dicastal are located here.

See also Part B, pages 27 ~ 31.

Voltage	Peak	Rush Hour	Rush Hour	Normal Time	Valley
1-10KV	0.7671	0.6804	0.4862	0.2933	
35-110KV	0.7431	0.6758	0.4712	0.2821	
110-220KV	0.7271	0.6652	0.4612	0.2716	
220KV and above	0.7191	0.6571	0.4562	0.2686	

ROH cost of electricity

Energy charges	
Peak energy	c/kWh
Off Peak Energy	c/kWh
Market charges	
Participant Charge	c/kWh
Ancillary Services	c/kWh
Meter Charges	
Meter Charge	per day per meter
Renewable Energy Charges	
SRES Charge	c/kWh
LRET Charge	c/kWh
Distributor Charges	
Annual Demand Rate	c/kW
Additional Demand	c/kW
Peak Usage Rate	c/kWh
Off Peak Usage Rate	c/kWh
Excess KVAR Charges	c/kVA

Industrial users within each region in China are generally subject to a common electricity tariff schedule, but prices vary, sometimes substantially, across regions. The NDRC and local governments regulate electricity pricing.

1 gigajoule = 28.5 cum

Natural gas

Price of Natural Gas - Arrowcrest research in China, 7 May 2010.

- 1 Qinhuangdao Economic and Technological Development Zone, Hebei (QETDZ)
CITIC Dicastal are located here.

Main provider:

Local natural gas corporation.

Price:

3.4 Rmb / cum

3.4 Rmb/cum = 96.9 Rmb per GJ

96.9 Rmb/GJ = circa \$14.53 per GJ

ROH cost of natural gas			
Energy charges			
Fixed charge			per month
Energy charges			per GJ
STTM Activity fee			per GJ
Network charges			
Demand haulage			per GJ

Metal for ARWs is AC601 or A365.2 irrespective of country of manufacture

1. AC601 is equivalent in chemistry and (post heat treatment) mechanical properties to A365.2.
2. ROH alloys its AC601 in-house using primary aluminium ingot (Alcoa Australia), silicon, titanium, strontium and magnesium.
3. ROH understands Chinese ARW manufacturers are using pre-alloyed ingots (additional energy costs) with the designation A356.2.

	Related Specifications					Chemical Composition												Mechanical Properties	
	Previous Designation	B.S. Alloy	Alum Assoc (US) Alloy Type	German Alloy	Japanese (JIS) Alloy	ISO Alloy	Si	Fe	Cu	Mn	Mg	Ni	Zn	Ti	Pb	Cr	Others Each	T.O.E. Temper Sand	
A.S.1874 1987																			
AC601	CP601	EN1257	A356 & A356.2	A1717Mg	AC4C		6.5-7.5	0.2	0.05	0.05	0.3-0.4		0.05	0.2			0.05	T1 130 T6 155 T6 195	

ARW aluminium alloy nomenclature

AC601

A = original alloy composition (ie. the first alloy with roughly this composition registered for common sale or use)

C = Strontium modification

6 = aluminium / magnesium / silicon alloy

0 = --- no significance

1 = --- no significance

A356.2

A = original alloy composition

3 = aluminium / silicon with copper and/or magnesium

5 = no significance

6 = no significance

.2 = ... 0 = as a casting, 1 = as ingot, 2 = slightly tighter spec than 1

Aluminium

At least 3 exchanges for aluminium :

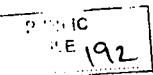
1. Rest-of-the-world price for pure aluminium : London Metal Exchange (LME) ;
2. China published price for pure aluminium : Shanghai Futures Exchange (SHFE) ;
3. Hard-to-find price : **Changjiang River Exchange = A356.2 pre-alloyed.** *(Some time after April 2011, the Changjiang River Spot Market might have been renamed as Yangtze River Non-ferrous Metal Spot market.)*

Arrowcrest research reveals that China's ARWs are using A356.2 pre-alloyed aluminium.

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Pure Aluminium



A356.2 pre-alloyed

See also non-confidential
attachment B-4.1.8

China price of ingot for wheels

7 Oct-10

1 Questions to the wheel manufacturers, 7 October 2010				2 Questions to the smelters of ingot, 7 October 2010				
				PRICES ARE FOR ALLOYED MATERIAL INQI PRIMARY ALUMINIUM				
	Contact	Phone No.	Department	Where to buy the ingot?	Name of wheel ingot producer	Ingot Model	The price of large amount including 1% VAT	Remarks
Dicastal	Chief Manager Jiang	86-335-3107203	Supply Dept.	Some ingot bought from Baoding Lihong Wheel Manufacturer	Baoding Lihong Smelter	A356.2	not more than RMB1000000ton	Answers from Manager Jiang of Dicastal
Dicastal	Chief Manager Wang	86-335-3163224	Sales Dept.	Some ingot bought from Sammensu Dicastal Wheel Manufacturer	Sammensu Dicastal Wheel Manufacturer	A356.2	RMB1570000ton	*Sammensu Dicastal produce the ingot for themselves *Answers from Manager Wang of Dicastal *The price is an average price in one week based on the spot price of Changjiang River
Zhejiang Wanfeng	Manager Ma Lu	86-575-8603622/86036486/86037680/86038035	Supply Dept.	No one pick up the phone every day in 3 days	NA		NA	
Baoding Lihong	Manager Dou	86-317-5997808	Sales Dept.	They are also a smelter, produce ingot for themselves and provide the ingot to other wheel manufacturers	Baoding Lihong	A356.2	RMB1000000ton	Answers from Manager Dou of Baoding Lihong
Kunshan Luhe	A staff didn't tell us the name	86-512-57312276/2262	Supply Dept.	Import the materials from USA, the ingot is bought from Hejian Shennius Group	Shennius Group Aluminum Sales Dept.	A356.2	RMB1500000ton	* This is just the aluminum ingot price, not the alloy ingot for wheel usage, so the price of wheel ingot will be higher than RMB1500000ton **Manager Zhang's Sales Dept. of Shennius Group *Tel: 86-376-2710859 *The price is an average price in one week based on the spot price of Changjiang River
Guangzhou Yunteng	A staff didn't tell us the name	86-20-86927686/2066145	NA	Buy ingot from Shandong Aluminum Company	Shandong Aluminum Company	A356.2	RMB1010000ton	Manager Zhang from Sales Dept. of Shandong Aluminum Company, Tel: 86-533-264531/264602
Weihai Yunteng	Manager Zhang	86-631-570881/86709788		No one pick up the phone	NA		NA	24

Non-confidential version

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A356.2 vs LME Pure

US Dollars

7-Oct-10

6.82786 forex

China ARW - Aluminium for less than adequate remuneration.

A Cost to produce pre-alloyed A356.2 aluminium for ARW, based on LME US\$ prices, 7 October 2010.

Ingredients	Chemistry	Cost per tonne US\$	Cost of alloyed material
LME price for Pure Aluminium incl. US\$200 delivery premium:	92 4710%	\$2,576 00	\$2,382 05
Silicon	7 0000%	\$2,017 00	\$141.19
Magnesium	0 3250%	\$2,690 00	\$8.74
Titanium	0 2000%	\$8,070 00	\$16.14
Strontium	0 0040%	\$7,289 00	\$0.29
Energy *			\$0.00
Total US\$ cost per tonne for A356.2 aluminium			\$2,548.42

B China ARW manufacturer's price for pre-alloyed A356.2 aluminium, 7 October 2010, excluding 17% VAT.

Wheel company	Alloy supplier	RMB per tonne	US\$ per tonne
Dicastal	Sannexia Dicastal Wheel Manufacturer	13,418.80	\$1,965.30
Baoding Lizhong	Baoding Lizhong	13,675.21	\$2,002.86
Kunshan Luhe	Shenhua Group Aluminium Sales Dept	12,820.51	\$1,877.68
Gaungzhou Yuanfeng	Shandong Aluminium Company	13,760.68	\$2,015.37

C SHFE price for pure aluminium, 7 October 2010, 3 month buyer, excluding 17% VAT.

US\$ per tonne	\$2,043.33
----------------	------------

D Aluminium supplied for less than adequate remuneration, 7 October 2010, US\$.

Wheel company	Advantage over SHFE	Advantage over LME
Dicastal	\$78.03	\$583.12
Baoding Lizhong	\$40.48	\$545.56
Kunshan Luhe	\$165.66	\$670.74
Gaungzhou Yuanfeng	\$27.96	\$533.04

A356.2 vs LME Pure

RE: Metalprices.com price lookup for Aluminum Alloy 356 Wheels

Date: Tue, Feb 14, 2012 at 2:50 AM
Subject: Metalprices.com price lookup for Aluminum Alloy 356 Wheels

- [REDACTED] currently has no commercial presence for alloy 356 in the Asia Pacific region.
- Our market intelligence suggests that the current premium for alloy 356 is approximately \$220 - \$240/ht above LME.
- I'm not sure what that price (item 3 below) refers to specifically, as everyone I have spoken to within [REDACTED] has confirmed that alloy 356 has always been sold at a premium to the LME. (and the premium is usually higher than standard aluminium ingot)
- Comparing item 2 below with our reports, it looks like Vat has been included

Our market intelligence suggests 356 is sold at a premium of above LME pure

Subject: Metalprices.com price lookup for Aluminum Alloy 356 Wheels

This website reported the following US\$ per kg prices for 16 Jan 2012, (for example), as follows:

1. LME official buyer cash US\$2,1210
2. Aluminum Shanghai 1 month US\$2,4525 (which might include 17% vat ?)
3. Aluminum Alloy 356 Wheels US\$1,951 (mean of low/high from 13 Jan to 3 Feb 2012)

The 16 Jan date is not relevant. It's just a nominal date.

It seems that the 356 price is always lower than the LME price but if we count the cost of producing 356 from pure aluminium then (by the time we add remelt energy, silicon, titanium, strontium and magnesium) that cost is always higher than LME pure ingot.

So why is the "Aluminum Alloy 356 Wheels" cheaper than pure ? Whereabouts globally is this material actually used to make wheels for passenger cars ?

Aluminium usage

Cast weight (kg) – as cast including sprue.	Ingot consumed (kg) = cast weight plus 4% melt loss (divide by 0.96).	Fettled weight (kg) = cast weight less sprue.	Swarf recovered (kg) for re-use or resale.	Finished weight (kg) – as packed.
14"				
15"				
16"				
17"				
18"				
19"				
20"				

Cost of aluminium per wheel sold =
Ingot consumed less swarf recovered.

Max. recycled swarf content is % or around %.

Other major consumables – ROH cost

Casting plant consumables	ROH Supplier	ROH avge. cost per casting
Fluxes		
Die coat		
Thermocouples		
Nitrogen		
Cutting tips		
Polishing rolls		

Machining & painting consumables	ROH Supplier	ROH avge. cost per packed wheel
Cutting fluid		
Cutting tips		
Metal cleaners & surface conditioners		
Powder coat primer paint		
Wet spray colour & clear lacquer paints		
Cardboard sheets and cartons		
Stretchwrap & packing consumables		

Consumables list – ROH cost

Function	Type	Supplier	Description	Unit	ROH cost
Melt cleaner - oxides, carbides & other nonmetallic inclusions	Flux - inject with nitrogen		Promag R1	Kg	
Melt - surface sealer	Flux		Coverall 104	Kg	
			Liquid nitrogen	Nm ³	
Removal of hydrogen gas	Compressed gas		15,000 litre storage vessel	Monthly hire	
Filtering of transferred melt	Filter cloth		55F Fiber glass continuous filament 12050111	Metre	
Die coatings to control rate of solidification, protect die face (cosmetics) & release agent	Water soluble - spray application		Dycote 39ESS Superfine	Kg	
			Dycote 34ESS	Kg	
			Small - OEM	Ea	
Die filter	Galvanised		Large - Aftermarket	Ea	
Fettling	Cartridge shaped sanding paper		Cartridge roll 10mm x 30 mm 120 grit	Ea	
Cutting fluid	Water soluble		ASO metal cutting fluid (dilute with 95% water)	Litre	
Profile cutting inside OE	Carbide		V8GT160408HP KC5410 162379	Ea	
Profile cutting outside OE	Carbide		IC1718833/E02 KC5410 8mm round	Ea	
Profile cutting inside AM	Carbide		VCGX220520-AL H10	Ea	
Profile cutting outside AM	Carbide		N123L2-0800-AM H10	Ea	
Drilling bolt holes	Carbide		QPV0750HD KC300 1981375 Spade blade	Ea	
Drilling bolt holes	Carbide		981-000262R-19007-D1 H13A	Ea	
Surface cleaner	Water soluble 50~80°C		Parco cleaner 1523R	Kg	
Deoxidiser	Water soluble ambient		Parco cleaner 1523S	Kg	
Chromate conversion coating for paint adherence	Water soluble 35~55°C		Deoxidiser 150	Kg	
			Alodine 1500	Kg	



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Paint list – ROH cost

Function	Type	Supplier	Description	Cure cycle (substrate)	Unit	ROH cost
Primer	Powder coat		Alloy Primer	200°C for 8 minutes	Kg	
Colour	Solvent wet		Silver	140~160°C for 20 minutes	Litre	
Colour	Solvent wet		Hyper silver	140°C for 20 minutes	Litre	
Clear	Solvent wet		Clearcoat	150°C for 20~25 minutes	Litre	
Primer for machined face wheels	Solvent wet		Clear	150°C for 20~25 minutes	Litre	

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Capital plant estimate

Capital required - OEN or AM

Summary Casting, machining and painting plant cost

Land area (casting plant, yard in front, side street and fence line to north and east)
Casting plant area (present incl. melt plant)

Capacity : 3,900 ARWs / day (100% yield)

AS : US\$ 1 040 936
Average for 8 months to August 2011

All US Dollars

20/04/2011
18,900 m²
9,300 m²

Item	Qty	Unit cost	Total cost
Casting operation			
Melt furnace	3		
Transfer ladle	2		
Degasser	1		
Hydrogen polishing equipment	1		
Spectrometer	1		
Low pressure machine	10		
Elevator and conveyor	1		
Pit, platform and crane for 10	1		
Common quench system	1		
Fluoroscopic X-ray inspection system	1		
Despouge cell w robot and 2 drills	1		
Heat treatment plant w carriers	1		
Plant maintenance spares inventory (3% of equipment cost)	3%		
Low pressure casting dies	40		
Die maintenance spares	0		
		Casting operation	
Machining and painting operation			
Machining cell as per WC08 incl tooling	5		
3rd op Machining and chuck and tooling	2		
Alloy wheel paint line incl. demin and water treatment	1		
Stretch wrapper	1		
Boxing machine	1		
Plant maintenance spares inventory (3% of equipment cost)	3%		

Machining gripper and jig inventory included in machining cell cost

Machining and painting operation

Vehicles

5 x forklifts Source : Alibaba 18 April 2011 US\$7 500 each
3 x manager's vehicles Source : Chinatoday.com.cn RMB259 800 each
1 x maintenance shop vehicle Source : Alibaba 18 April 2011

Sub-total vehicles
Intangible assets (know-how)
Total operation

"The Chinese auto-parts industry has high capital intensity. Foreign and SOE companies' large-scale production requires significant capital to install automated processes, equipment and machinery."

Economic Policy Institute
January 31 2012
Briefing Paper #316
Page 15
www.epi.org

OEM Packaging – ROH cost

Wheel Size	Pallet		Stretchwrap		Total cost per pallet	Wheels per pallet	Cost per wheel
	Qty	Cost	Qty per pallet	Cost per pallet			
14x6	1		1				
15x7	1		1				
16x7	1		1				
17x7.5	1		1				
18x8	1		1				
19x8	1		1				
20x8.5	1		1				
22x8.5	1		1				

Use returnable
plastic trays

Aftermarket packaging – ROH cost

Wheel Size	Pallet		Carton cost		Caps and decals cost		Wheel sock & bag cost		Stretchwrap Cost per pallet	Total cost per pallet	Wheels per pallet	Cost per wheel
	Qty	Cost	Qty per pallet	Cost per pallet	Qty per pallet	Cost per pallet	Qty per pallet	Cost per pallet				
14x6	1		28		28		28				28	
15x7	1		28		28		28				28	
16x7	1		28		28		28				28	
17x7.5	1		20		20		20				20	
18x8	1		20		20		20				20	
19x8	1		20		20		20				20	
20x8.5	1		20		20		20				20	
22x8.5	1		20		20		20				20	

Piece cost	Carton	Cap	Decal	Wheel sock & bag
14x6				
15x7				
16x7				
17x7.5				
18x8				
19x8				
20x8.5				
22x8.5				

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Metal dies



- 1 Top core = inside mounting surface 2 Bottom core = front face styling surface 3 Two rim slides = outside tyre side

Other expense items include top & bottom bolsters, pins & bushes, air & water cooling plumbing, ejector plates & strippers.

Metal dies cost

Description	QTY	MATERIAL	Breakdown Cost of Die Components in \$USD				
			12"-14"	15"-16"	17"-18"	19"-20"	21"-24"
Top bolster & accessories	1 set	Mild steel					
Top core	1 off	H13 casting					
Top core bush retainer ring	1 off	Mild steel					
Top core accessories as below							
a) water cooling channel plate	1 off	Mild steel					
b) vent pin hold down plate	1 off	Mild steel					
c) water cooling inserts & plugs	10 off	316 Stainless Steel					
d) window location pins & bushes	5 off	H13					
Bottom bolster & accessories	1 set	Mild steel					
Bottom core	1 off	H13					
Rim slide machine	1 set	Cast iron					
Rim slide bridge assembly	1 set	Mild steel					
Other parts:							
Air vent pins	1 set	Mild steel					
Ejector plate assembly	1 set	Mild steel					
Stripper	1 set	Mild steel					
Spue retainer ring, cap & bushes	1 set	Mild steel					
Die straps	1 set	Mild steel					
Ejector plate push back pins	1 set	Nitrided pins					
Clamp blocks	1 set	Mild steel					
		TOTAL					

Additional items if required:							
Top core insert	1 set	H13					
Bottom core insert	1 set	H13					
Ureol	1 set	Plastic					

Payment:
 40% deposit
 40% after shipping
 20% after successful completion of casting trial # 1

Core life = circa 50k shots

Labour

Rmb per week – advised by
Zone managers in China.

Wages per week (Rmb) - Arrowcrest research in China, 7 May 2010.

1 Qinhuangdao Economic and Technological Development Zone, Hebei (QETDZ)

CITIC Dicastal are located here.

Administration	375-500	High-level, skilled	750
Management	375-500	Commonly skilled	500
Security	375	Low level (normal)	200-375

2 Dongnan Development Zone, Changshu City, Jiangsu

Futek are located here.

Administration	375-500	High-level, skilled	500
Management	250-3753	Commonly skilled	300-400
Security	250	Low level (normal)	150-300

3 China-Singapore Suzhou Industrial Park, Suzhou, Jiangsu (SIP)

YHI Suzhou are located here.

Administration	500-700	High-level, skilled	500-600
Management	500-700	Commonly skilled	375-500
Security	375-500	Low level (normal)	300-375

4 Jishigang Industrial Park, Yin Zhou District, Ningbo City, Zhejiang

Ningbo Yongqi Aluminium Wheel are located here.

Administration	400-600	High-level, skilled	500-625
Management	400-600	Commonly skilled	375-500
Security	450-625	Low level (normal)	200-375

5 Shanghai Xinzhuang Industrial Zone

YHI Shanghai are located here.

Administration	750-1250	High-level, skilled	750-1000
Management	750-1250	Commonly skilled	625-750
Security	500-750	Low level (normal)	300

Nomenclature

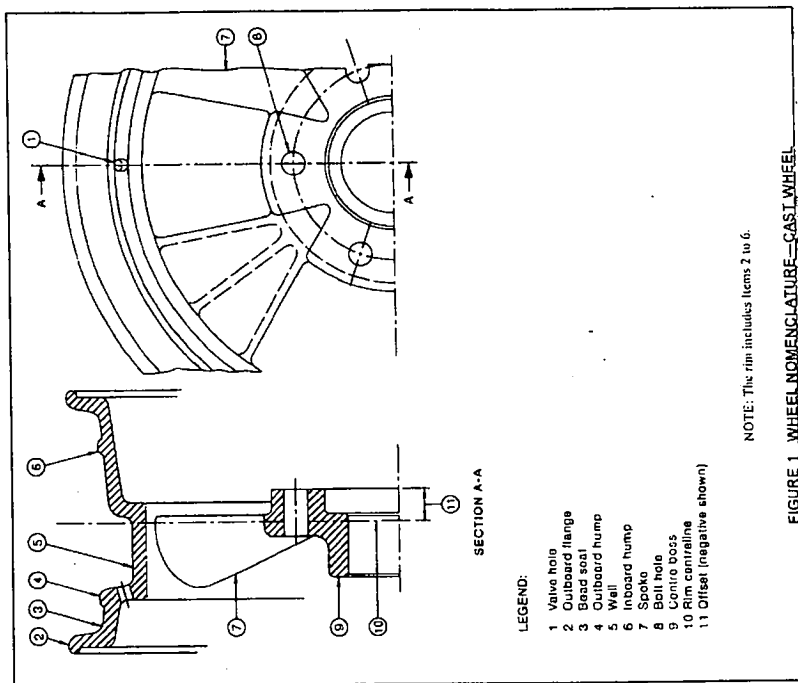


FIGURE 1. WHEEL NOMENCLATURE—CAST WHEEL