



<http://www.alusash.co.kr>

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9F, SUNGWOO BUILDING, 1424- 2
SEOCHO- GU, SEOUL, KOREA, 137- 864
TEL : +82 2 3470 3184 , FAX : +82 2 3470 3199

1.

2.

3.

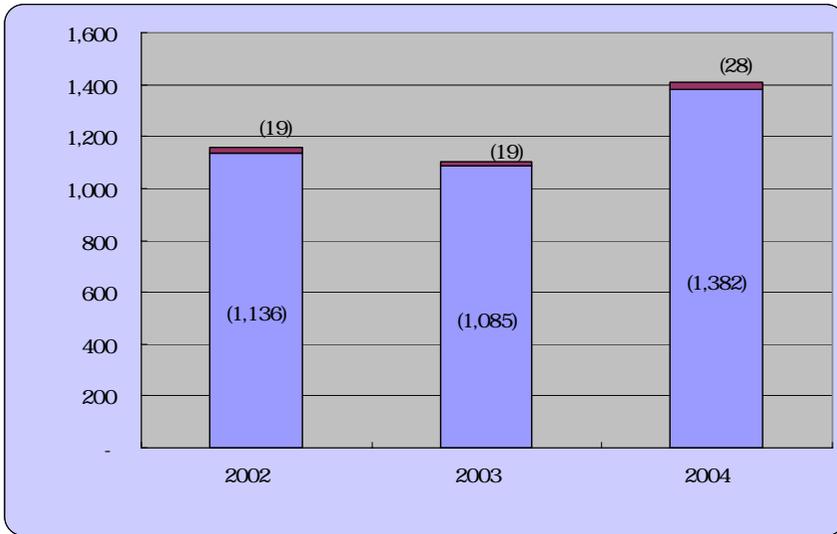
1.1 Group

						KPT	
	1,410	1,000	800	100	100	160	3,570
	297	120	187	40	90	45	800 (2,500)
					,		
	Al (, ,)	Curtain Wall	Al (IZ Bumper, Al Form)			PVD	

1.2



	230		297 (217)
	, SYSTEM WINDOW		, C/WALL, , , ,

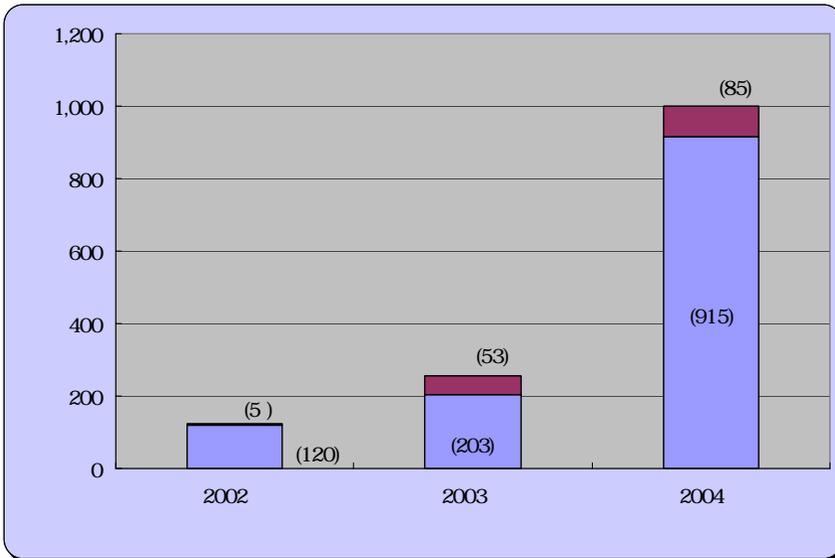


1956. 06.	
1963. 12.	800 ()
1972. 04.	
1975. 04.	1 ,
1980. 07.	2
1986. 03.	3
1994. 10.	5 , 8,000
1997. 05.	ISO 9001 ,
1999. 12.	(T.G.V Project)
2002. 11.	KPT
2004. 08.	TS 16949
2005. 08.	Group

1.3



	91		120 (0)
	C/Wall (Unit C/WALL, Stick C/WALL)		AL- Form , , ,

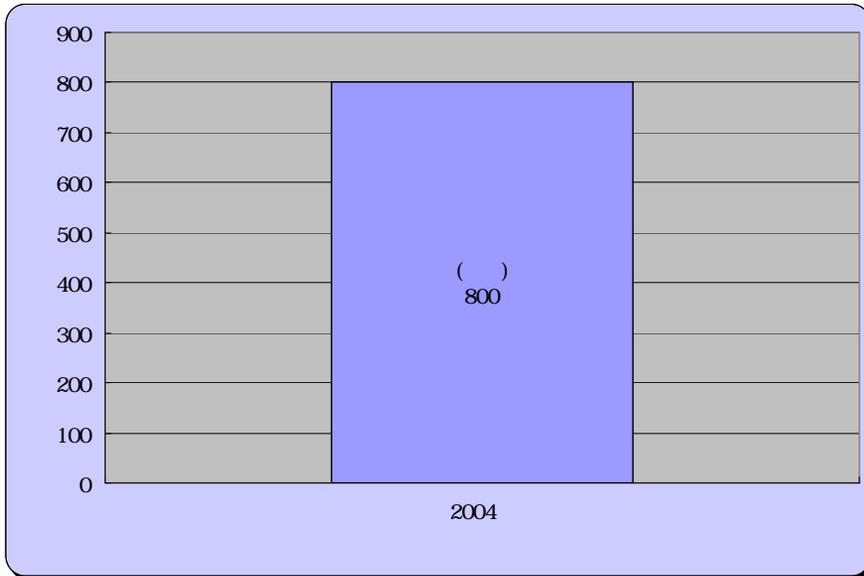


1978.	
1987. 11.	
1992. 10.	NC (14)
1995. 12.	ISO 9001
1998. 08.	
1999. 02.	ISO 14001()
2001. 11.	
2002. 01.	
2005. 08.	KDBC5
2005. 08.	

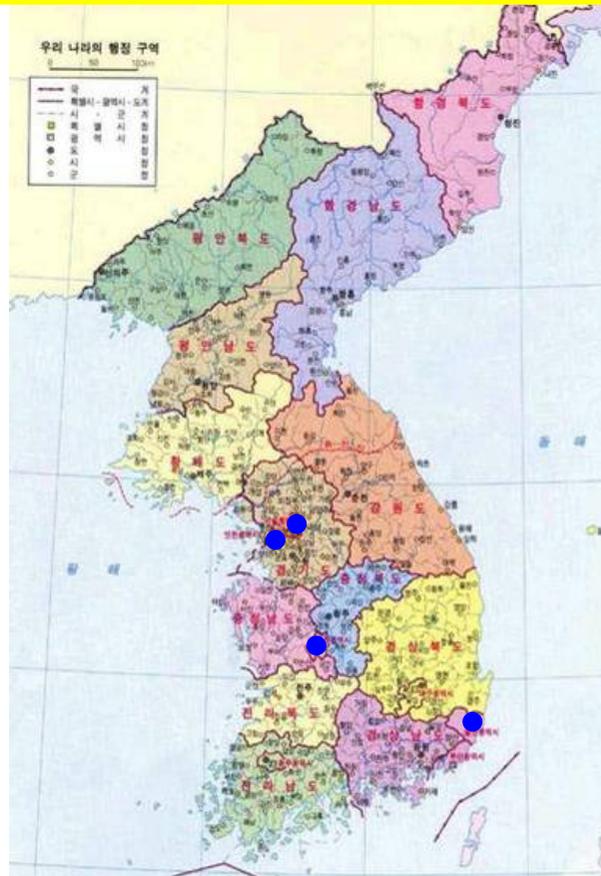
1.4



	156		187 (163)
	C/WALL, AL-FCRM, , , , , ,		



1978.	
1987. 11.	
1992. 10.	NC (14)
1995. 12.	ISO 9001
1998. 08.	
1999. 02.	ISO 14001()
2001. 11.	
2002. 01.	
2004. 05.	
2005. 08.	KDBC5
2005. 08.	



	120
	1,000

	187
	800

2.

2.1



- , 10% 6~8%
- CO₂, NO_x



-
-
-
-



- 2000 0.7% (3.74)
- 2000 0.5% (13,697), 0.5% (0.99)
- 2001 0.5% (8.1), 0.4% (5.1), 2.3% (3.0)

2.3

ALCOA



- 2004

4

252

2

580

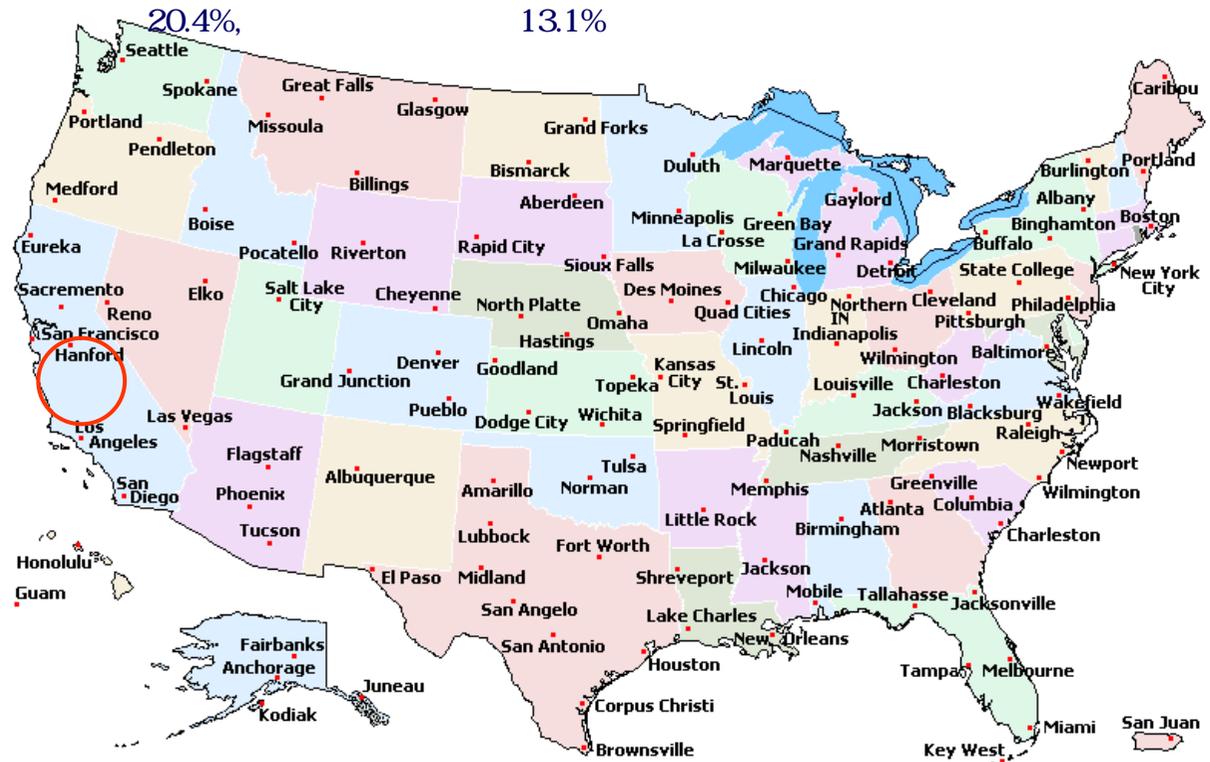
35.2%,

20.4%,

13.1%

ALCOA

15%



2.3 - HYDRO



- 2004 7
- 132
- , , Simulation
- 30%

▶ HYDRO

- 5%,
- 25%
- 33,000
- ()



2.3



- 2004 1

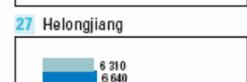
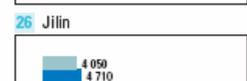
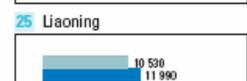
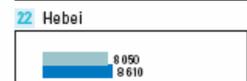
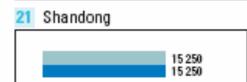
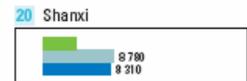
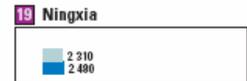
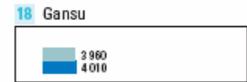
- 5 2 (34.4%), 9 4 (29.5%)

- 684 , 619 , 20%

- 2000



Sources diverses.

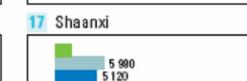
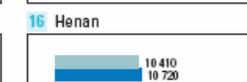
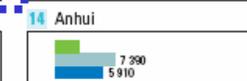
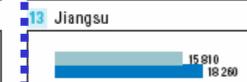
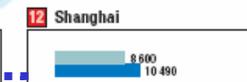
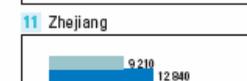
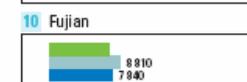
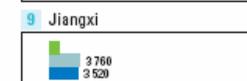
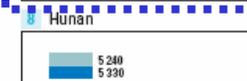
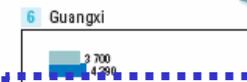
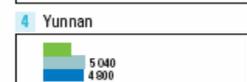
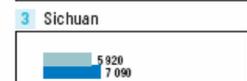
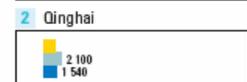


- 10

- 26.7%

- 10 5

- 15~ 20



25%

0 5 000 10 000 15 000 20 000 25 000

0 5 000 10 000 15 000 20 000 25 000

0 5 000 10 000 15 000 20 000 25 000

0 5 000 10 000 15 000 20 000 25 000

2.3

COMALCO



- 2004
- 189
- 84%
- 11%

➤ Comalco

- Comalco Alumina refinery project,
Boyne Island smelter



2.4



- 2000 441 , 13,697 , 3.74 ,
 992,091 0.5% (0.7%) .
 - 1960 , 1970~ 80 , 1990 ,
 1998 IMF M&A .
 - () 416 , 2002 193,000 , 177,500
 17,500 , .



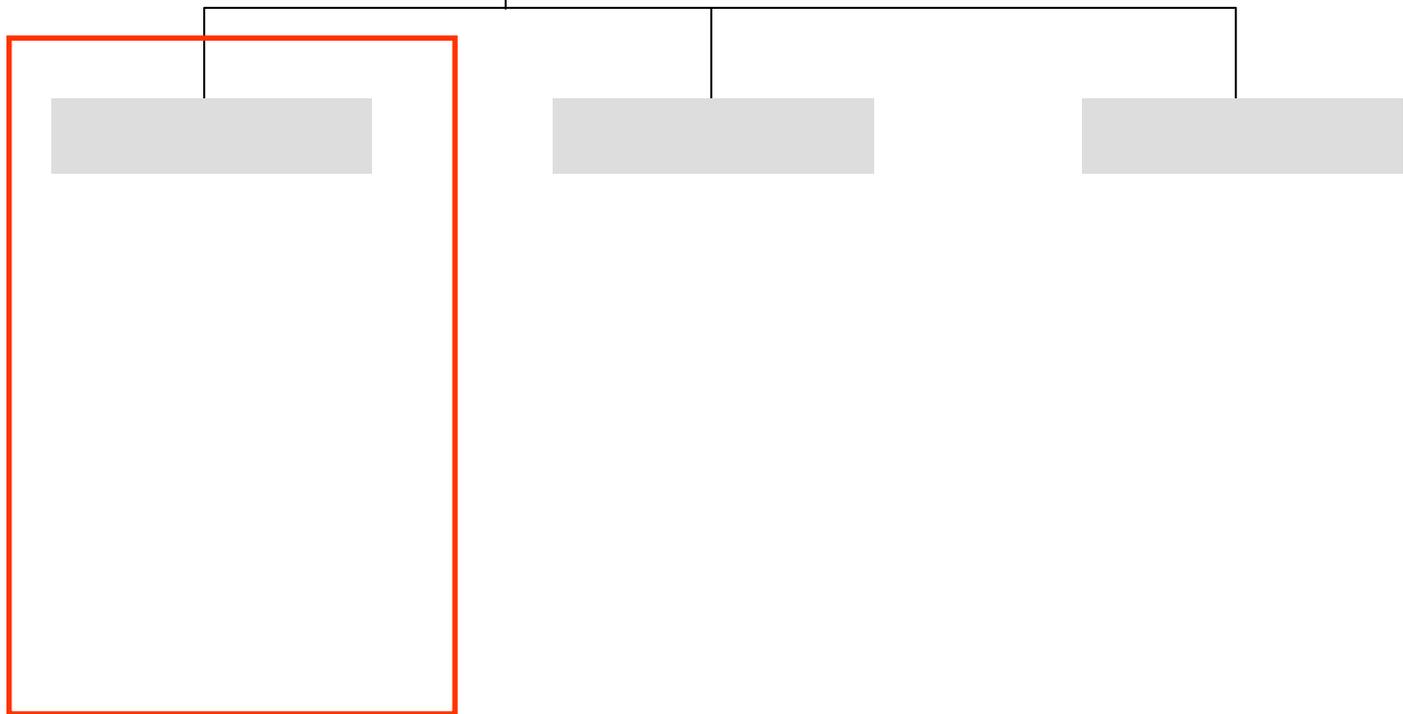
- 2005 240,000 7.1%,
 2010 304,000 5.0% .
 - 2005 1,200 12.0%,
 2010 1,650 7.5% 2005 680 , 2010 900 .

3.

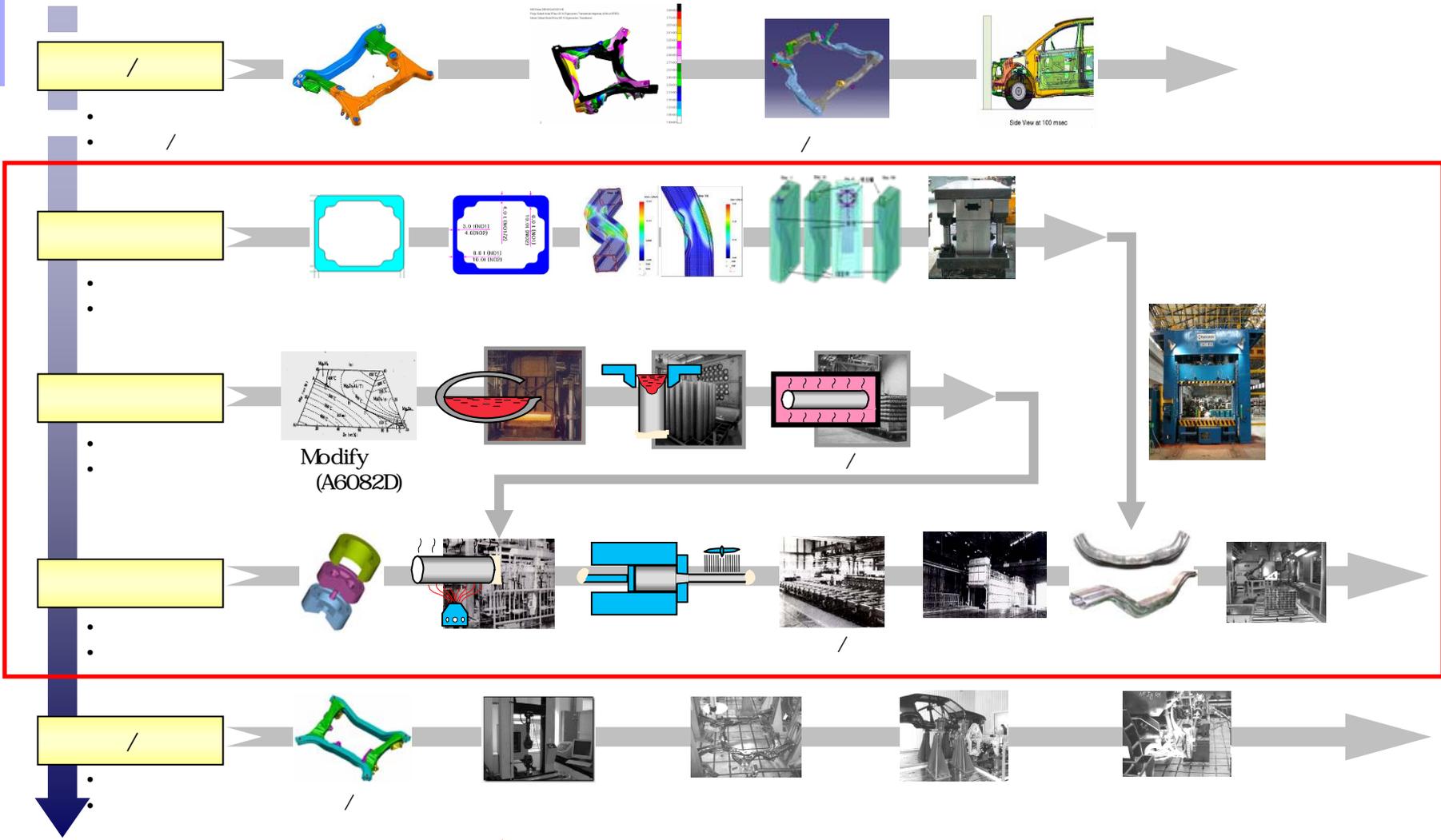


- Noise

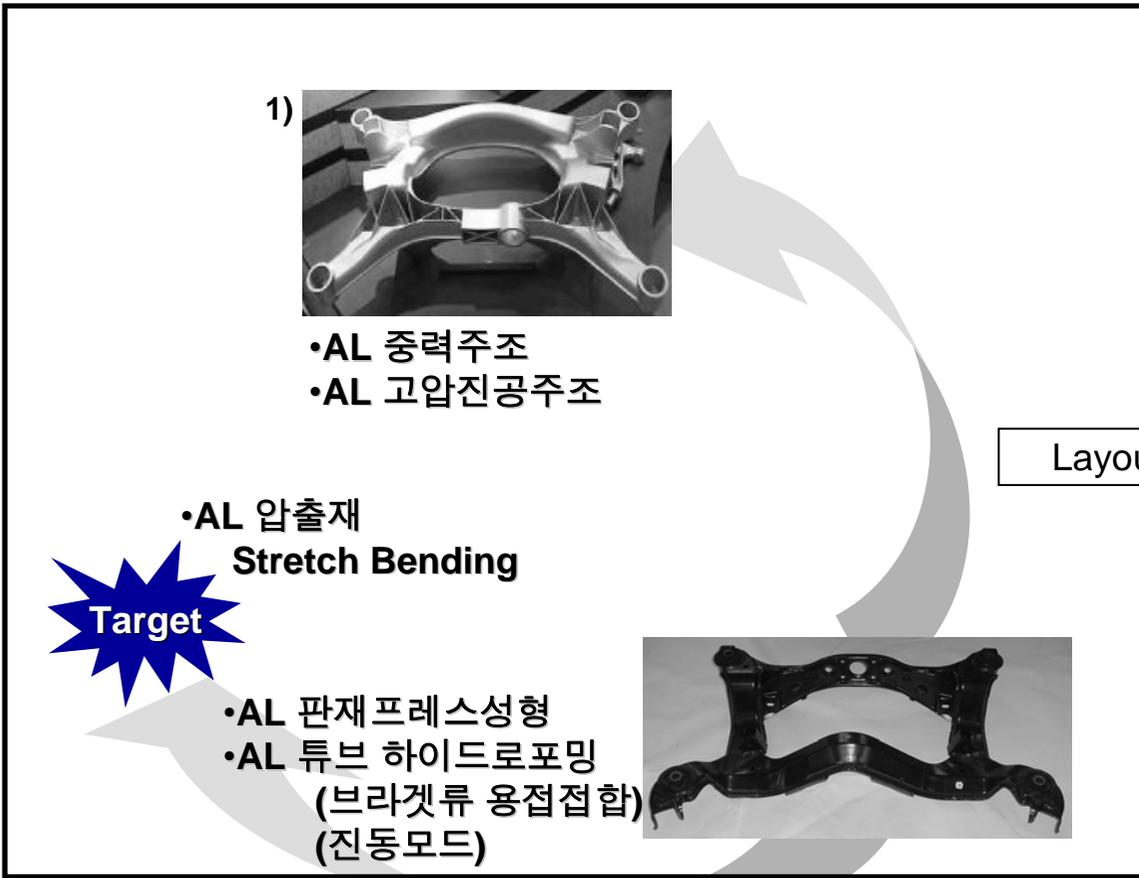
- NVH



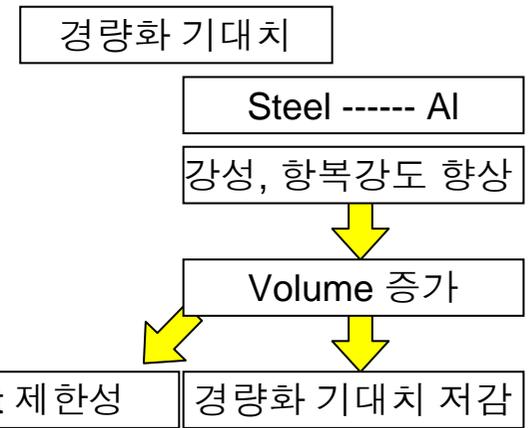
Kg



파
적



중 량



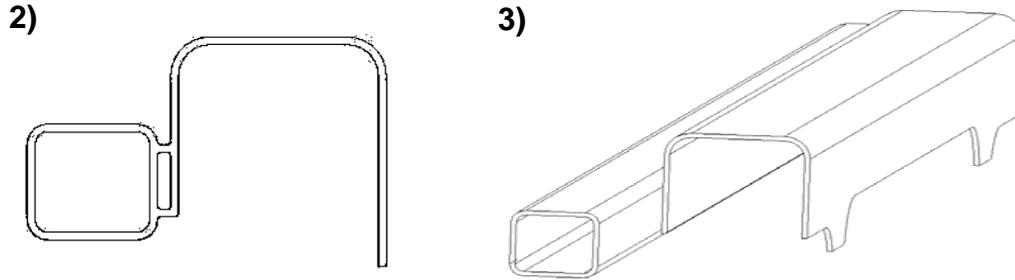
	중 량	가 격
•강재	100%	100%
•고장력 강	~85%	105 ~120%
•알루미늄 주조	75 ~85%	150 ~170%
•알루미늄 압출성형	50 ~ 70%	~150%

설계 자유도 증가 : volume space 감소
부품제작 Infra 구축(module)

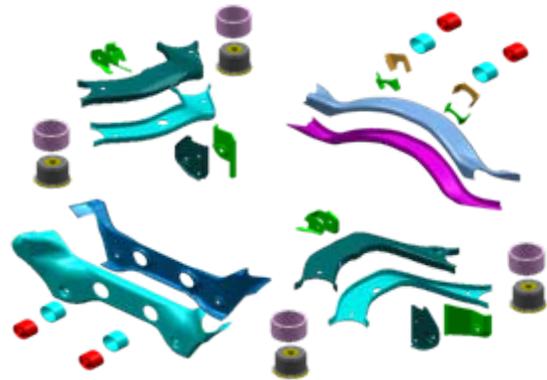
1) 일본 Asahi Tec (알루미늄 주조 공법응용)

- 경량화 : Steel 대비 > 30%
- 내구성 : > 300,000Km

- 인장강도 : >310MPa (T6)
- 항복강도 : > 270MPa (T6)
- 연신율 : >10% (T6)



기존공정

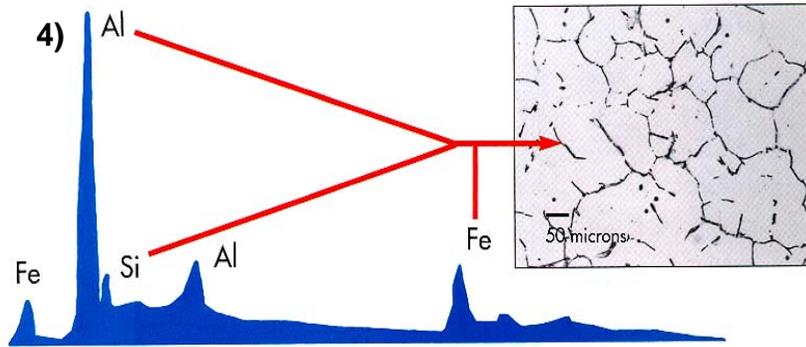


- 생산가공 공정 단순화 : 공정수 >30% 절감
- Hollow type : 경량화 기여도, 소재비용절감
- 고 강도 Hollow type : 경량화소재 두께감소
- 후 별도 표면처리 생략

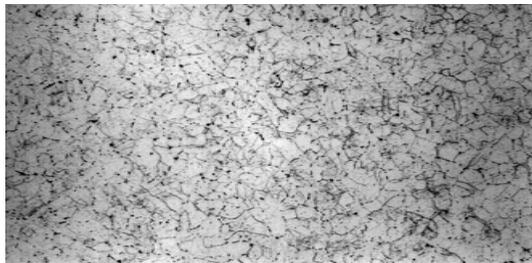
- 압출성형 공정 적용 전용 개량 6XXX 알루미늄 합금 빌레트 개발
 - 결정립도 $200\mu\text{m}$ 이하, 역편석 $100\mu\text{m}$ 이하, 산화물 및 기타 화합물 입자 $100\mu\text{m}$ 이하, 수소농도 $0.20\text{cm}^3/100\text{g}$ 이하, Mg_2Si 함량 1.0% 이하

합금설계 : Si excess 인장강도 향상

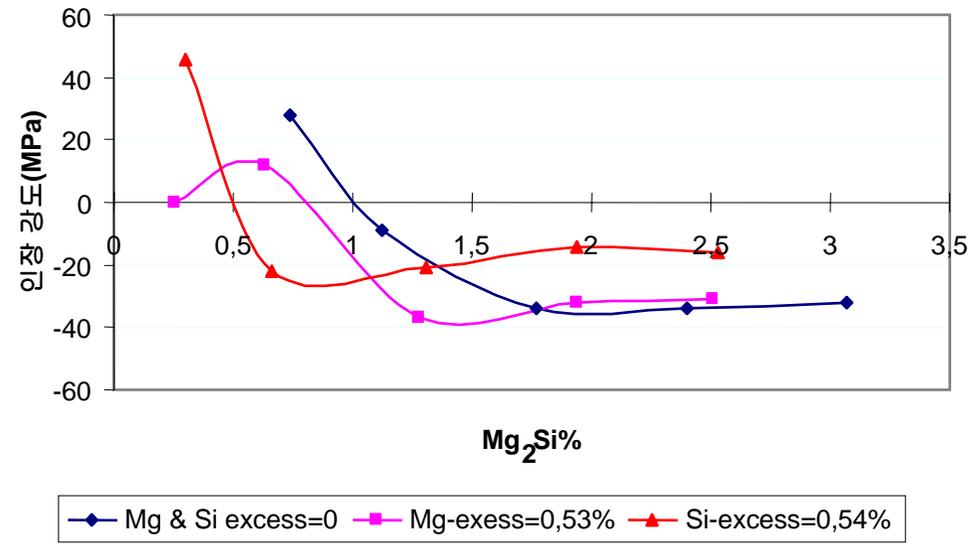
Al(Fe, Si)의 편석현상



Micrograph of as-cast structure with energy dispersive spectrograph identifying the elements in the intermetallics, (200 mag).

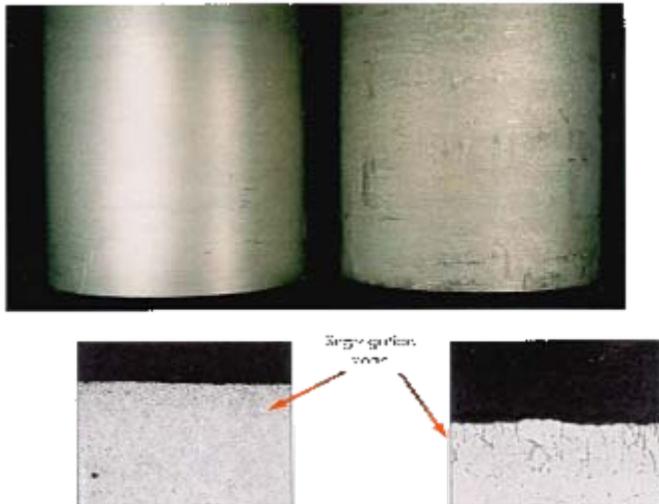


5) Mg_2Si % 함량과 인장강도와의 관계 (자연시효 (RT=24 Hour) 실시 후)

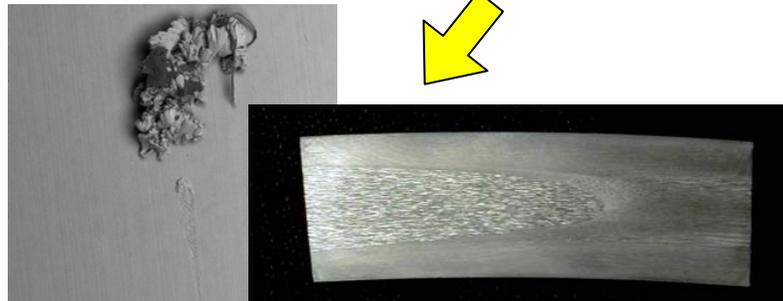


○ Billet 주조 공정기술 개발

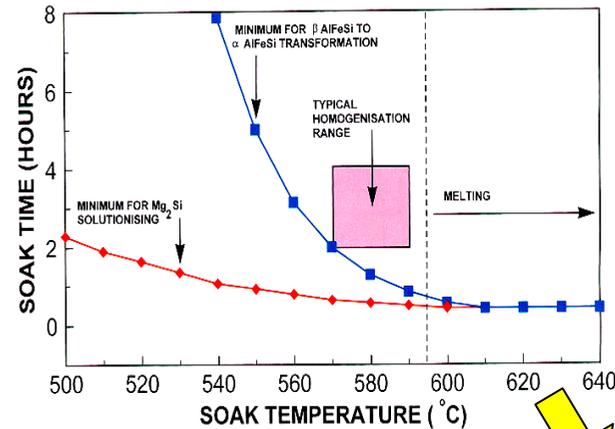
- 주조표면의 불순물 segregation --- 주조공법, 냉각속도 개선
- Homogenization 온도 --- 압출후 표면 재결정층의 조정



6) Billet 표면 결함에 따른 Pick up 및 Back end defect 결함



HOMOGENISING OF 6000 SERIES ALLOYS



Billet : Mg₂Si 고용량
α Al(Fe,Si)



8) Bending 결함



7) 표면 재결정층의 생성 현상

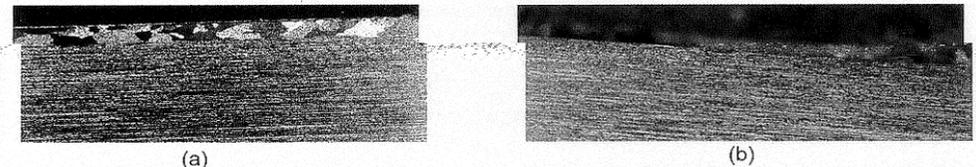


Figure 5: The coarse grain surface layer on the 6082 extrusion in micrograph (a) was eliminated in the extrusion shown in micrograph (b) by reducing the homogenisation temperature by 60 °C. Rapid water quenching was used in both cases.

6) 압출형제 표면의 결함현상(pick up, back end defect)

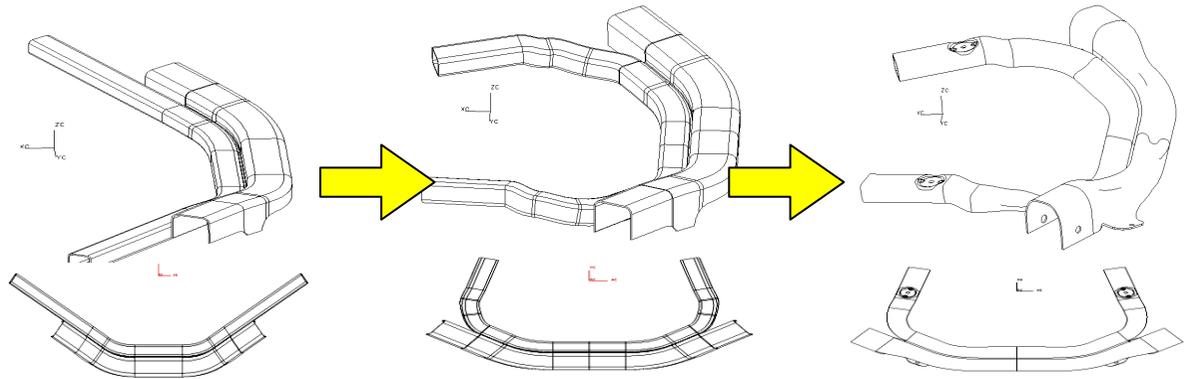
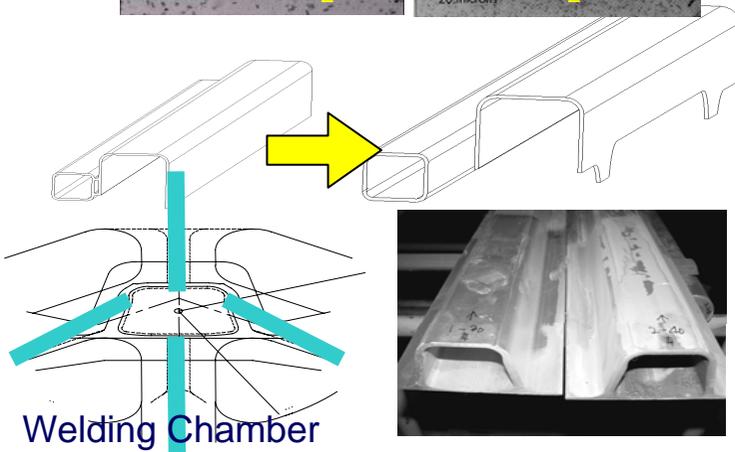
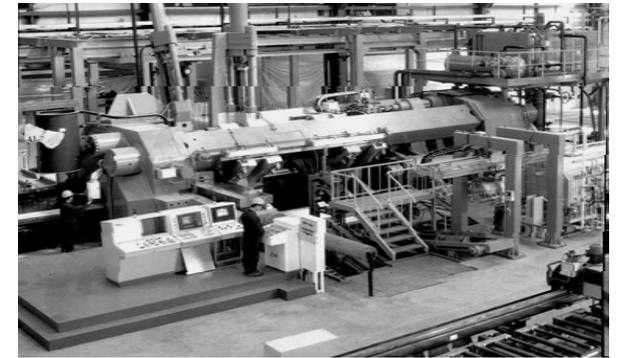
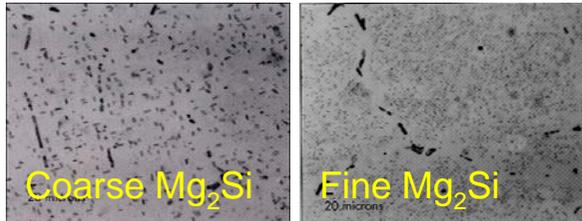
7) A.J. "Bill" Bryant et al, "Homogenisation of aluminium alloy extrusion billet", Light Metal Age, April 2002, p6.

8) Bending 시 결함현상 : Alcan 기술자료

- 개량 A6XXX 알루미늄 합금 빌레트의 압출성형 기술개발
 - 압출 후 기계적 성질 향상을 위한 균질/냉각 공정기술 개발
 - β AlFeSi 화합물 \rightarrow α AlFeSi 화합물 변태율 90% 이상, Mg_2Si 석출상의 β' 및 β'' 비율 90% 이상

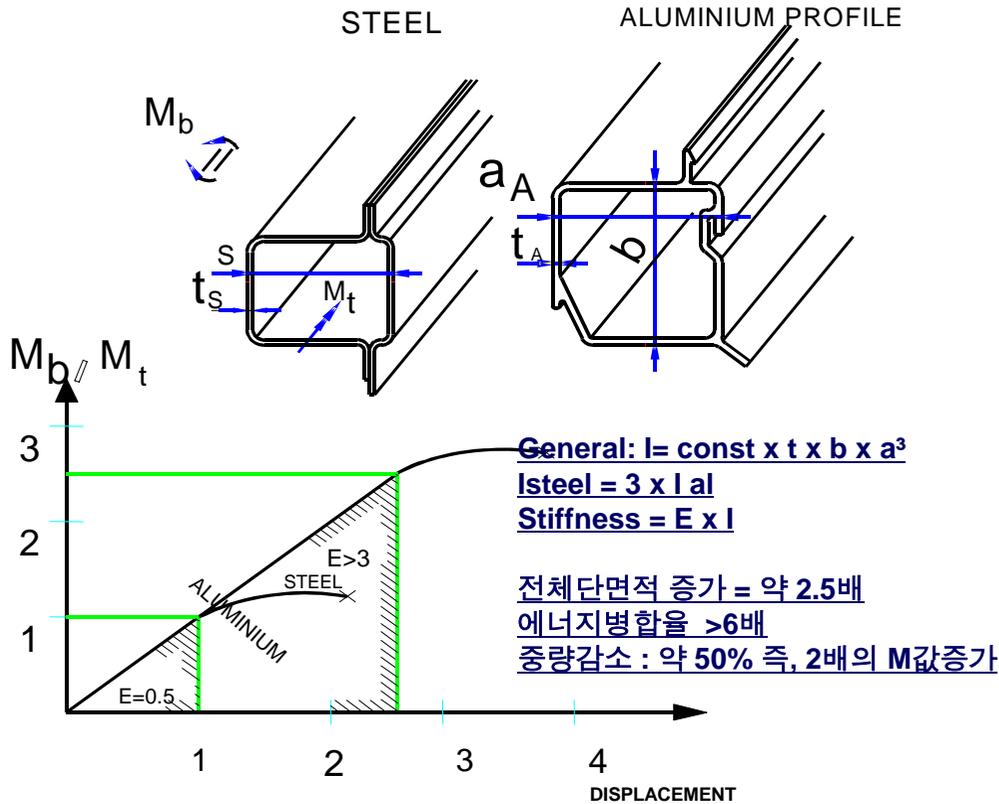
일체형 sub frame

- Welding chamber & Port 수량
- 표면 재결정층
- 인장강도

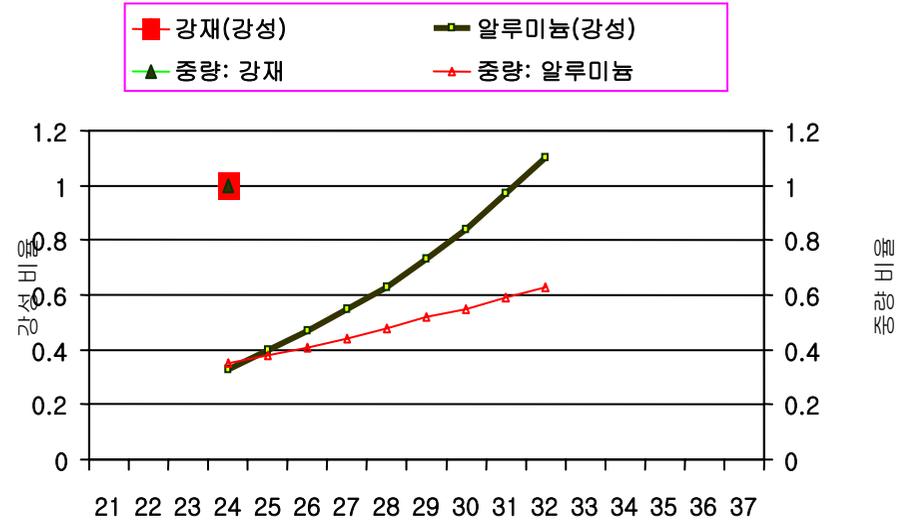


가공공수 감소 / 원자재 사용량 감소 / Stiffness 유지

AL 재료 및 hollow 형상



I : 항복강도
 E : 에너지

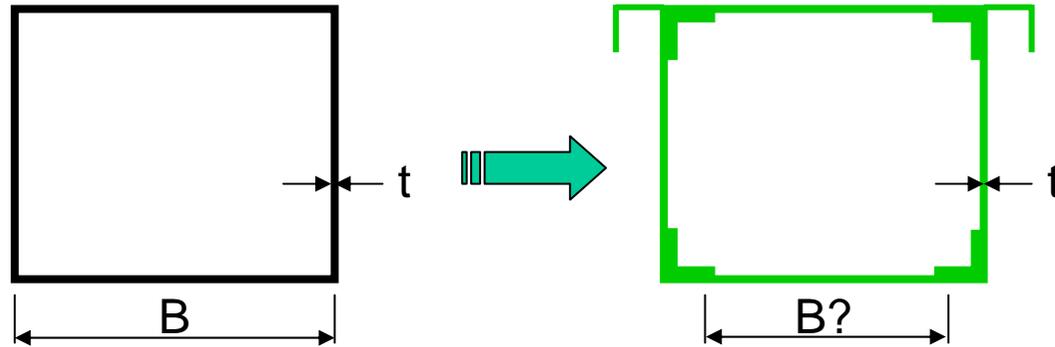


외경 (mm)의 함수로서의 외경
 치수

동일강성비 : steel = AL x 1.3
 동일중량비 : steel = AL x 0.4

Volume 증가 및 무게증가 요인발생

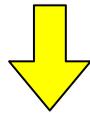
압출성형기술



$$\frac{B}{t} \downarrow \Rightarrow \sigma_{\text{critical}} \uparrow$$

$$\Rightarrow \text{Capacity} \uparrow$$

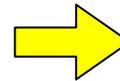
Hollow 형상의 국부적 두께변화를 이용 : 임계응력 값 증가
단면계수 개선, Volume 증가 없는



최고 관성모멘트 유지

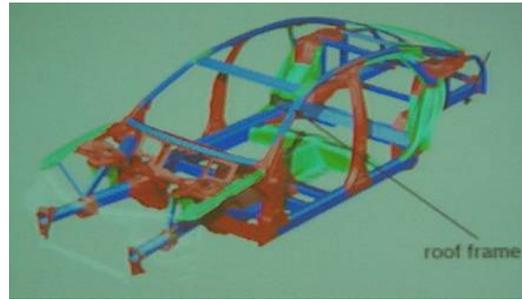
재료에서의 인장강도 유지

압출성형후 항복강도



고강도, 저중량, 저 space
알루미늄 서브프레임

➤ : Audi A8



- Casting (,)
- Sheet Metal
- Extruded

➤



< - H/F >



< - E/F >



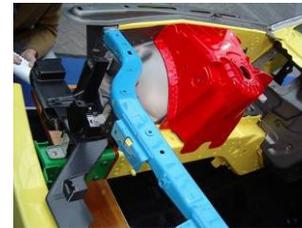
< >

➤ : Jaguar XJ



- :
5XXX
- , :
6XXX or 7XXX

➤



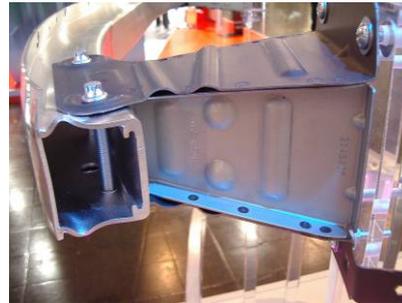
- Body structure - Casting
- Safety Structure
- Body Structure - Extrusion
- Magnesium Casting
- Hydroformed parts

➤ Control Arm ()

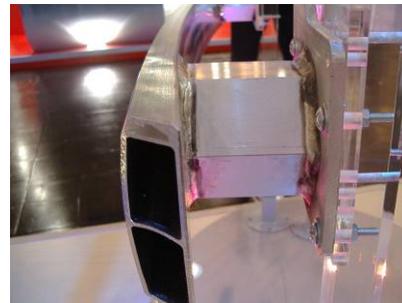
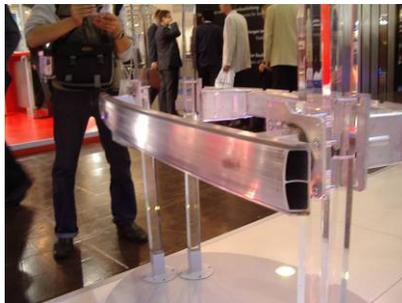


- : Audi- VW A4/A6/Pssat
Mercedes S Class
VW Phaeton
- : 6XXX (6082, 6060), T6
- : / ,

➤ Bumper Back Beam



- : 6XXX , 7XXX
- :
- : , type
- : type()



- Crash Box
- :
- :



- FR Subframe
- + +
- AL 6XXX
- MIG

BMW 745i



- FR Subframe
- +
- +
- AL 5XXX
- MIG

HONDA LEGEND



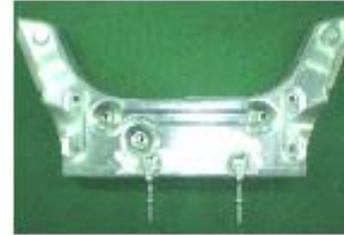
NISSAN SKYLINE

- RR Subframe
- +
- AL 5XXX
- MIG



NISSAN ALTIMA

- RR Subframe
- +
- AL 5XXX
- MIG



VW LUPO

- FRT Cross Member
- +
- AL 5XXX
- MIG



BMW 530i

- FRT Subframe
- + +
- AL 6XXX
- MIG

- V

[Redacted]

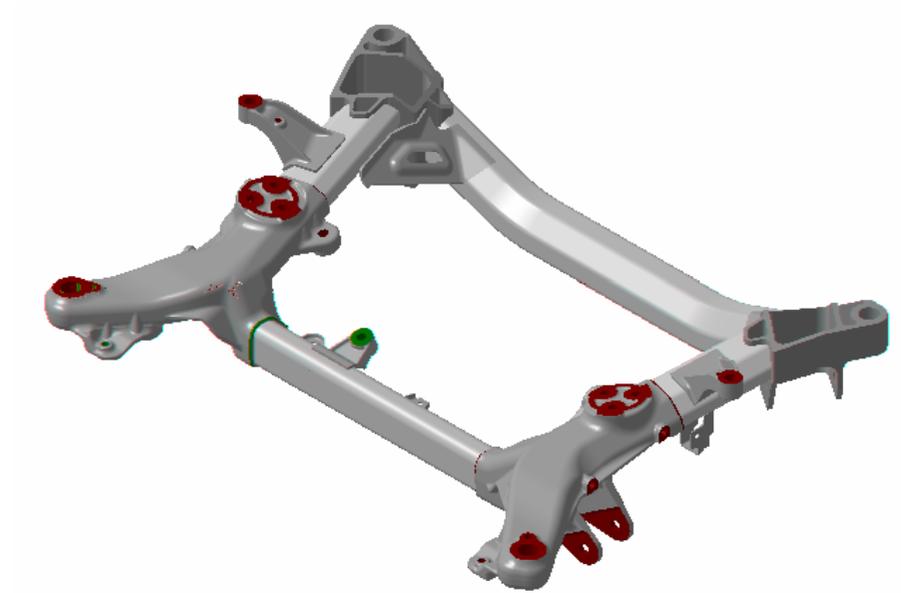
-
-
-

[Redacted]

- Proto Front Subframe
- V
-

[Redacted]

- (VI)
- 60,000 /
- 72



- (B, C)



[Redacted]

-
-
-

[Redacted]

▪ Proto

-
-

(C)

[Redacted]

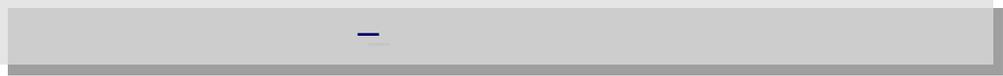
▪ C

B

150,000

-

▪ 75



-
-
- 5mile ()



-
- L, F
-



- 13,000
-
- 10



Front Bumper



Rear Bumper

- Front End Module Carrier

[Redacted]

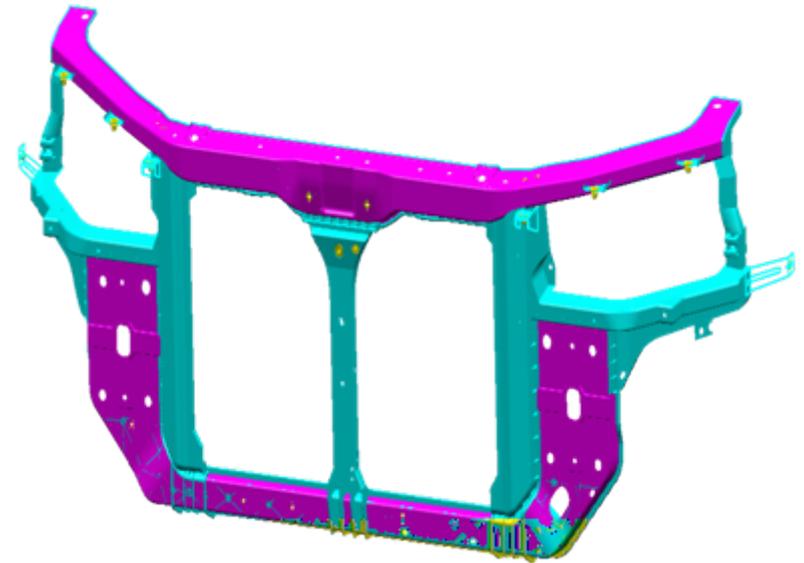
-
-
-

[Redacted]

- FEM part
-
-

[Redacted]

-
-
- V 60,000



Side Gate

[Redacted]

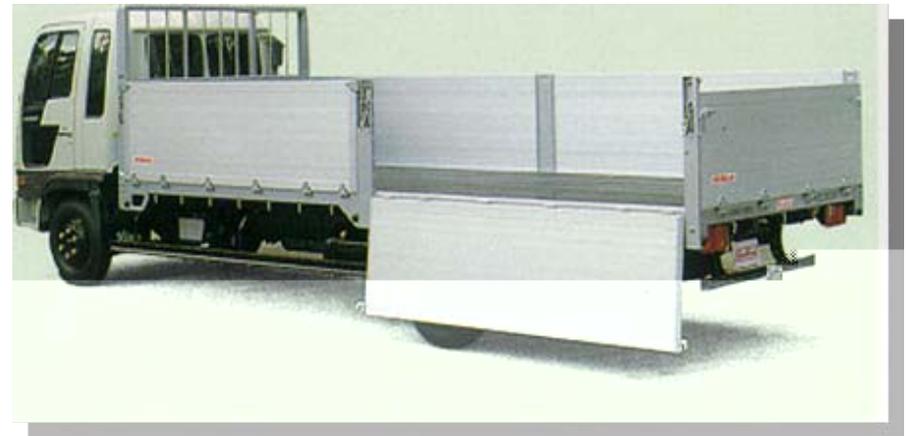
- ,
-
- ,

[Redacted]

-
- ,
-

[Redacted]

- 100,000



- Seat Rail

[Redacted]

-
-
-

[Redacted]

-
- , Steel
-

[Redacted]

- RV, SUV



- CVVT Rotor Vane



[Redacted]

-
-
-

[Redacted]

-
-
- 95%

[Redacted]

- HD 100,000
- VVT



- Center Braket



-
- ,



-
- 10,000 ()



- 1ton 100,000



[Redacted]

- (G-7) - 2009
- - 2010
- (,)
-

[Redacted]

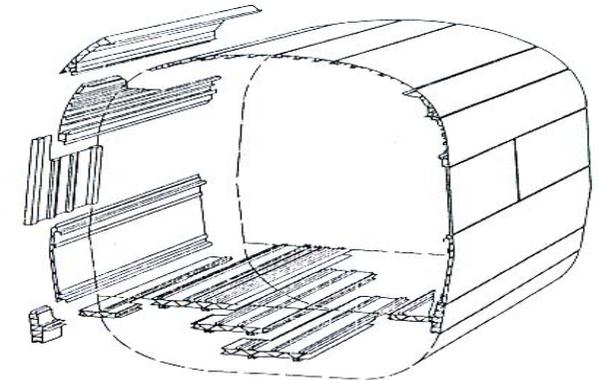
- 8000
- (1 , 1)

[Redacted]

- (, SMG) (ROIEM)
- (ROIEM)
- :

[Redacted]

- 500 ton ,





< >



< >

[Redacted text block]

-
-
-
-

[Redacted text block]

-
- / PSD
-

[Redacted text block]

-
-

[Redacted text block]

-

[Redacted]

[Redacted]

- : 9,750 million \$/yr.
-
- : 12 US\$/lb

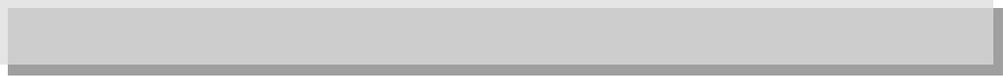
[Redacted]

-
-
-
- Falcon Aerospace, Fry Steel Co. , etc.

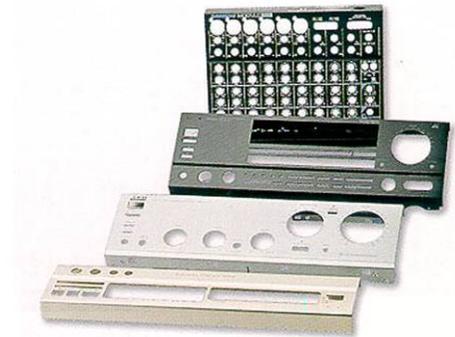
[Redacted]

- : 200 ton/month
- (ex. Boeing etc.)

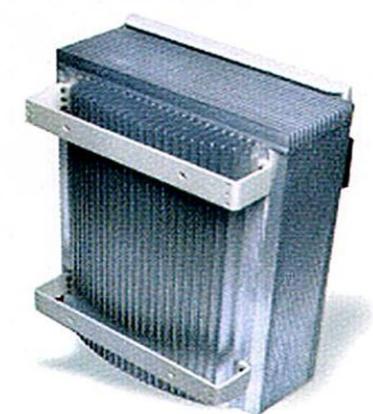


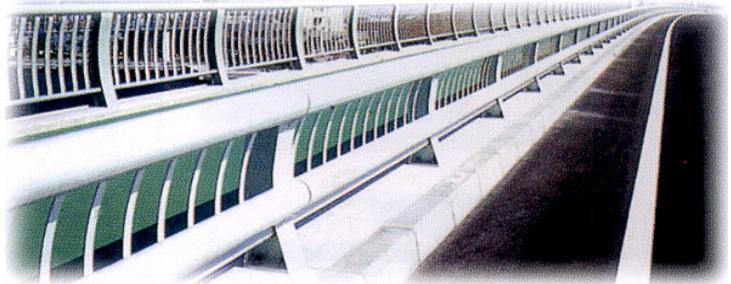


- (EMI TEST)
- PDP, LCD ,
-



-
- 1
- , car – booster, Heat – sink, Front Panel,
- Motor case, Bus- Bar
- PDP, LCD , DVD





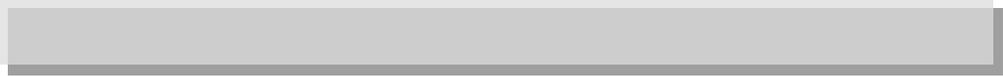
[Redacted]

- ()
- ()
- ()

[Redacted]

- PDF- Aluminum
- All
- Western wall form
-





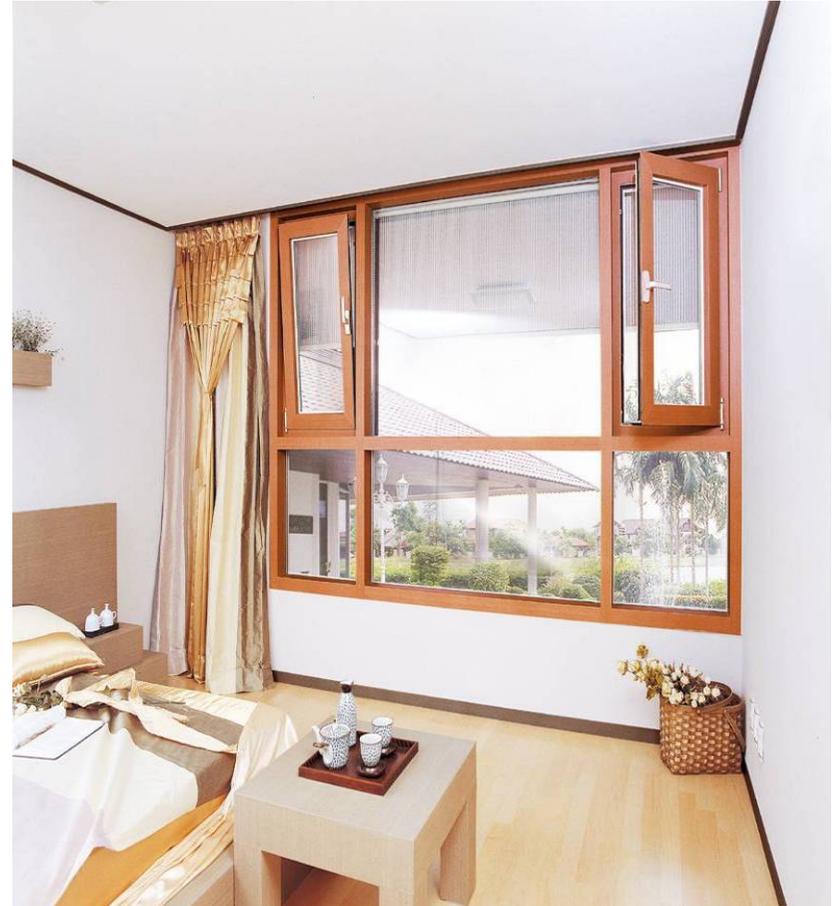
-
- 2000
- , ,



-
- ,



-
-
-





DIRECTOR'S GUILD/



MACAU TOWER/



/