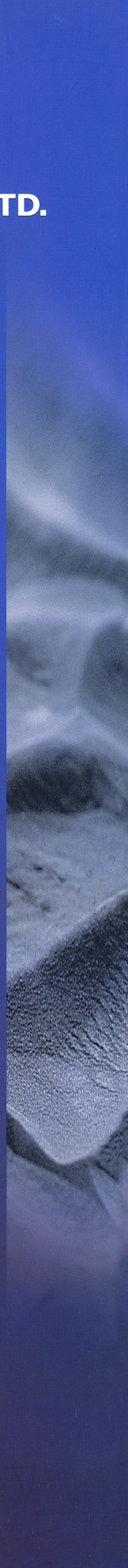
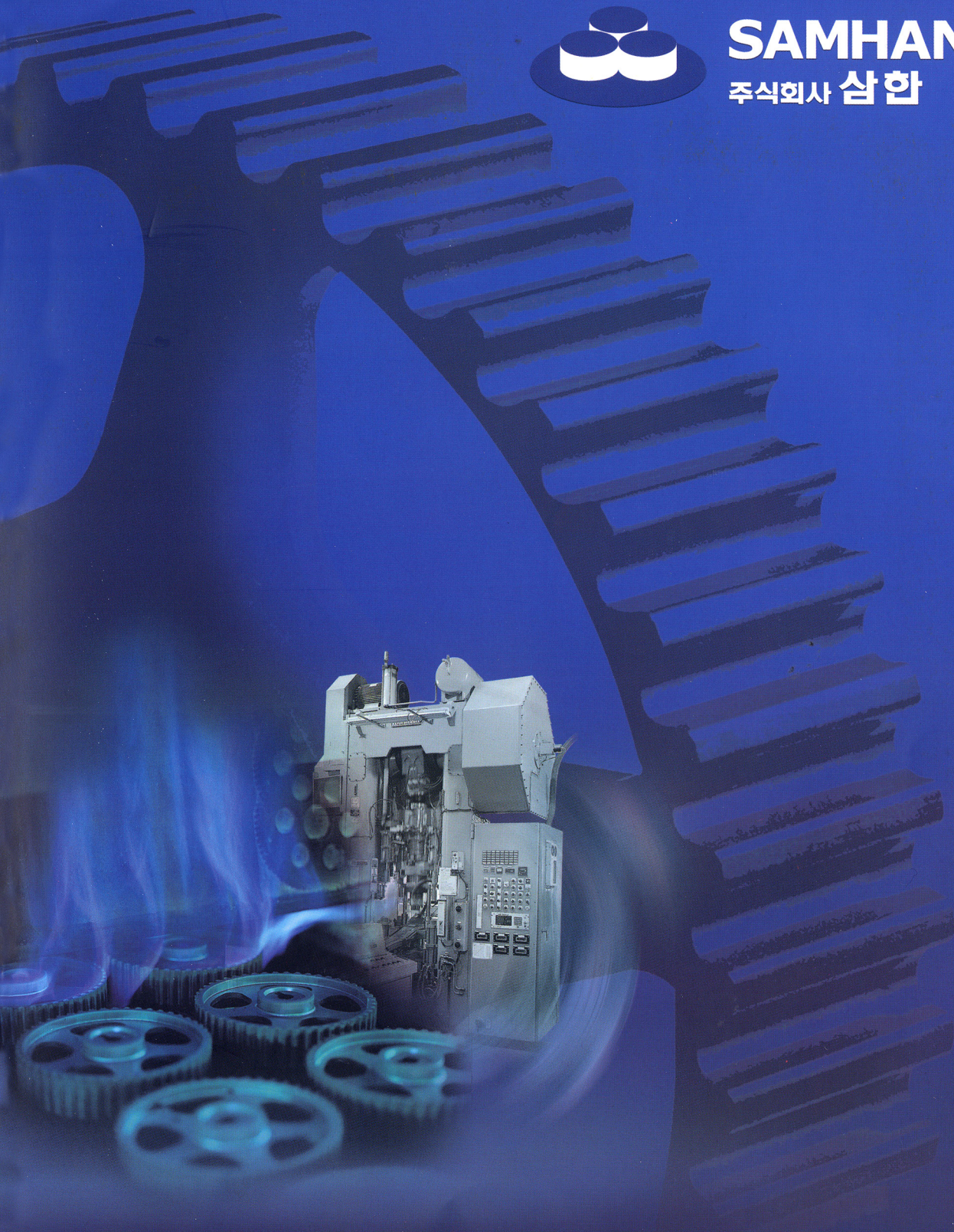


SAMHAN CO., LTD.

주식회사 삼한



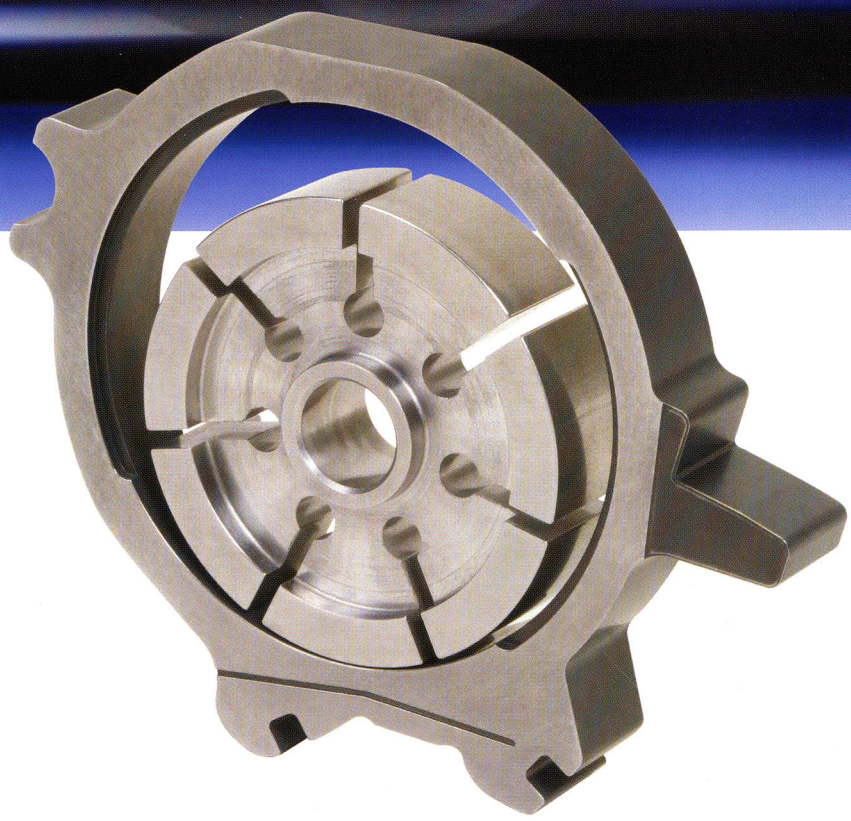
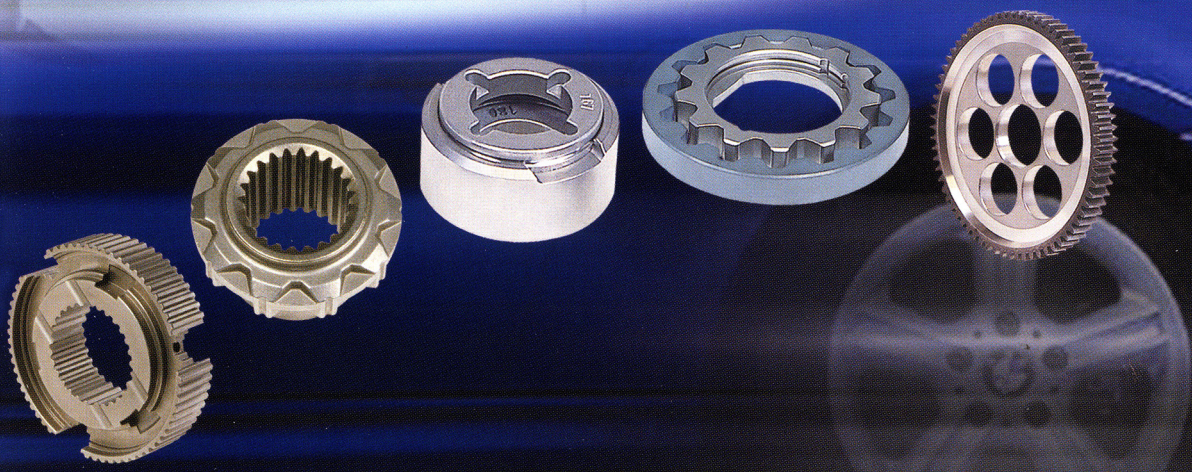
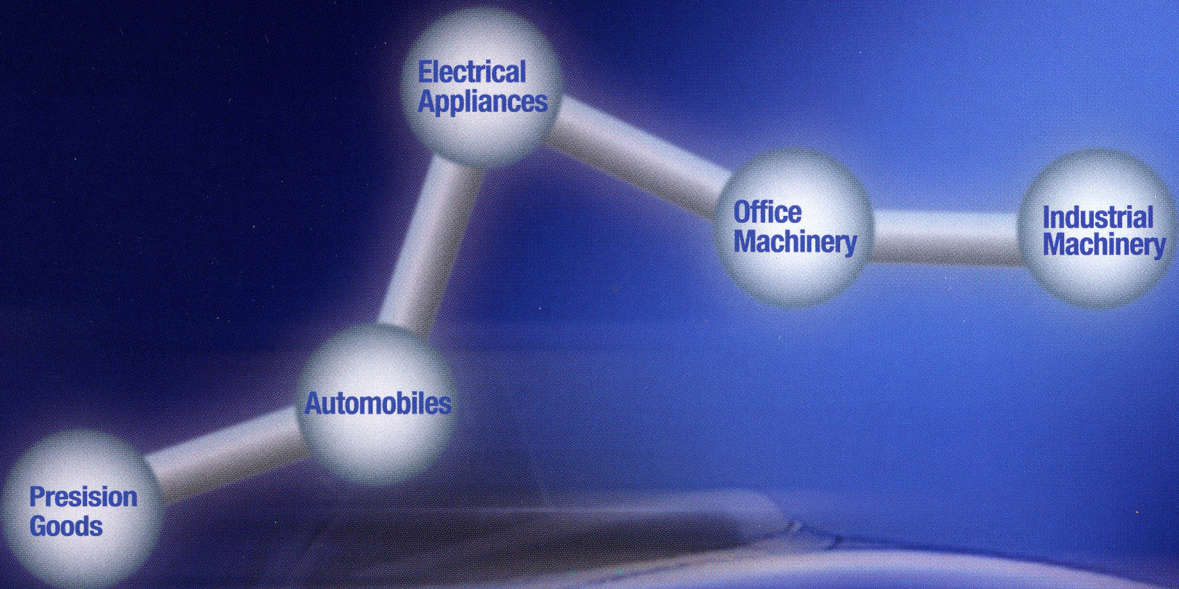
SAMHAN's Future, Making it With You!

삼한의 미래, 고객과 함께 만들어가겠습니다.



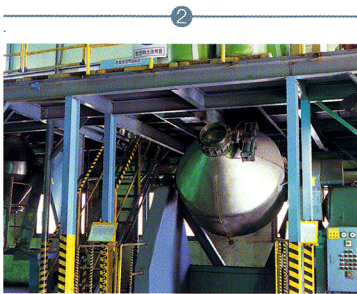
SAMHAN with its long experience and advanced technology manufactures parts for automobiles, electrical appliances, agricultural machinery, industrial equipment etc. To provide its clients with high quality Products at the most reasonable price, SAMHAN is constantly experimenting on ways to improve and develop new technology.

(주)삼한은 6의 도입으로 고객만족을 경영의 최우선으로 하여 연구개발과 신기술에의 적극적인 투자로써 일반구조용 부품인 자동차, 전자, 농기계, 산업기계, OA기기 등에 가격경쟁력을 확보하고, 특수공법인 진공소결로, 고온소결로 등을 활용한 연자성부품, 내식, 내마모부품, Stainless계열, 고온내식성부품 등을 생산하고, 고객의 원가절감에 적극 기여하고 있습니다.



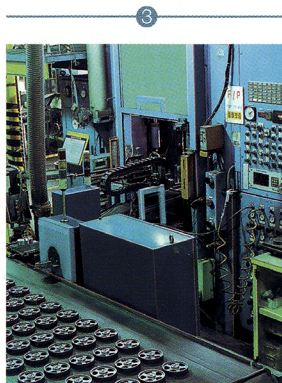


For High Performance, For Cost Reduction



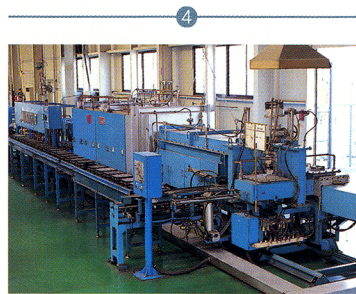
Mixing/100kg~3ton Double Cone

Various types of powdered metal are combined in a designed ratio

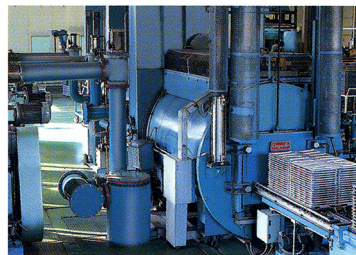


Compacting/10ton~750ton Press

A controlled amount of mixed powder is automatically gravity fed into a precision die and is compacted usually at room temperature, at pressures 3~7ton/cm²



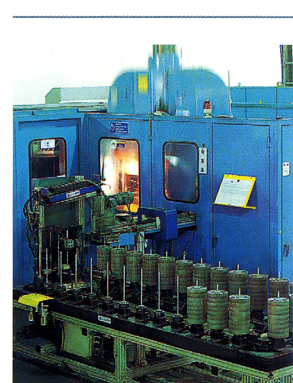
High temperature



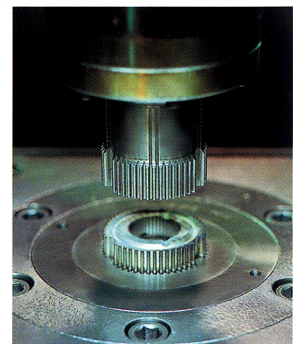
Vacuum



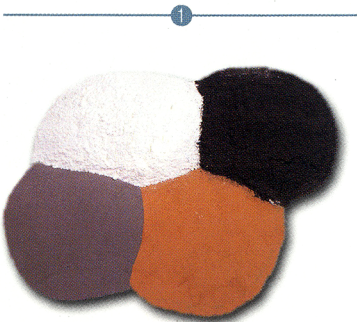
Atmosphere



Sizing(Repressing)

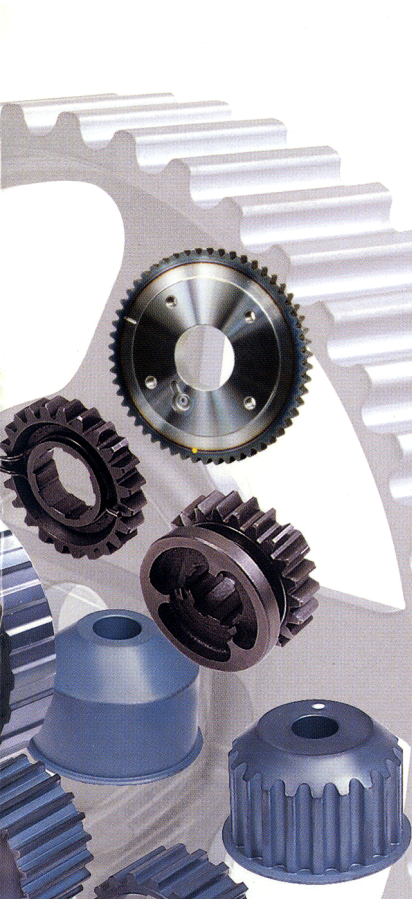


10ton~630ton



Raw Materials

Sintering compacted parts are heated below the melting point of the base metal, sintering transforms compacted mechanical bonds between the powder particles into metallurgical bonds(solid state), typical sintering temperature ranges are 1120~1200℃



SAMHAN guarantees customer satisfaction by providing cost-competitive products with high quality

첨단 생산기술과 풍부한 경험으로 삼한은 최고의 품질을 추구합니다.

What is powder metallurgy

P/M is a highly developed method of manufacturing precision metal parts. Made by mixing elemental or alloy powders and compacting the mixture in a die, the resultant shapes are then sintered or heated in a controlled-atmosphere furnace to bond the particles metallurgically.

5



Machining(Turning)



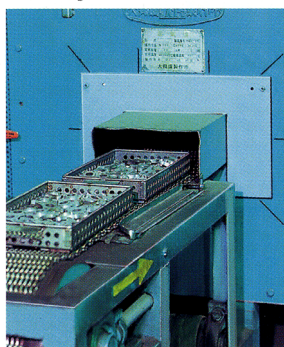
Grinding

- Milling
- Drill and tap

Secondary operation
P/M parts are generally ready for use after sintering, however, to provide special properties, the parts can be repressed, impregnated, machined, tumbled, plated or heat-treated.

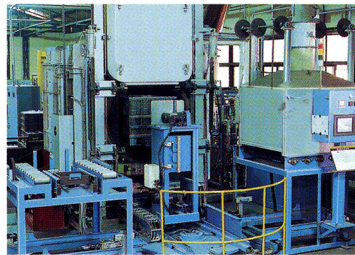


Washing

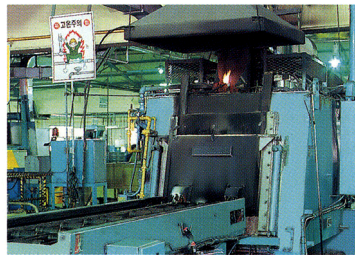


Drying

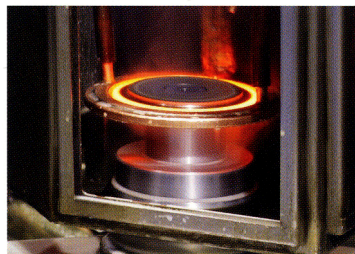
- Deburring



Steam treating



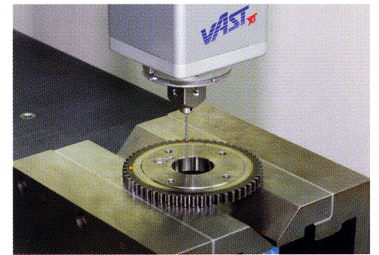
Quenching & tempering



High frequency

- Impregnation(Oil, Resin)
- Dacro
- Infiltration
- Shot Peening

6



Inspection



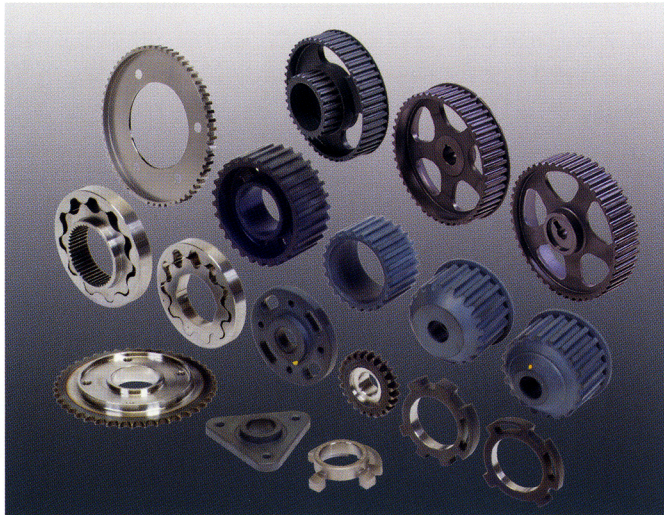
Storage→shipping



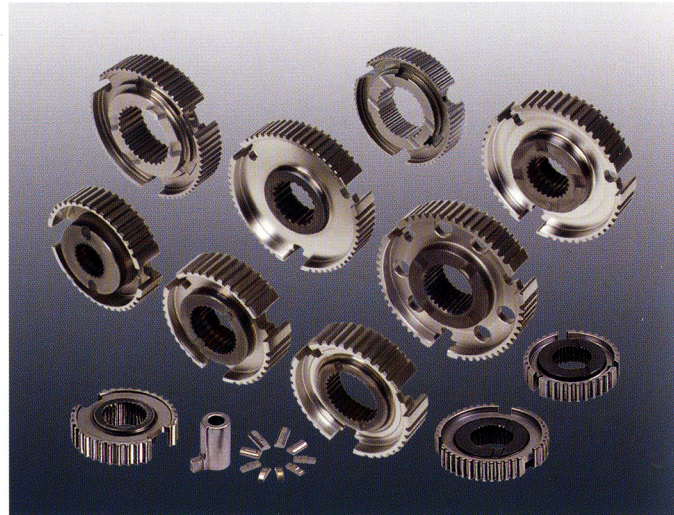
Parts of Ferrous Alloys

철 분말 / 일반구조용 부품

P/M is a chipless metalworking process



Automobile parts for engine

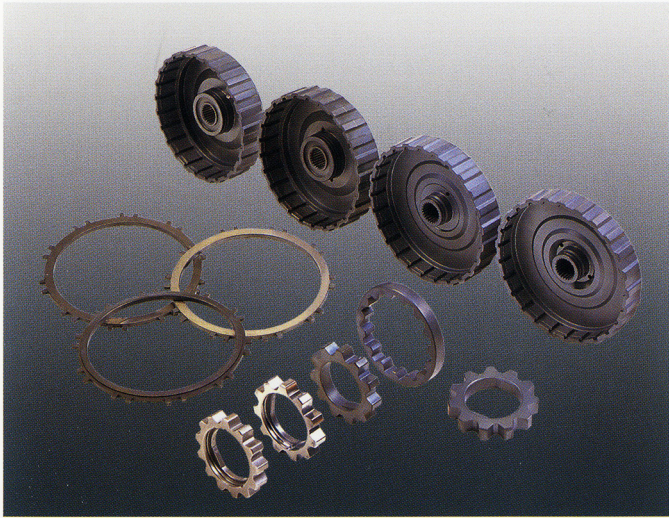
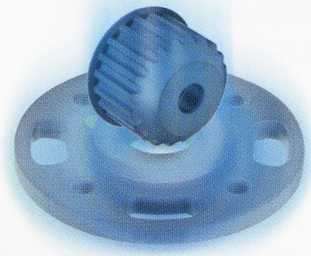


Automobile parts for manual T/M

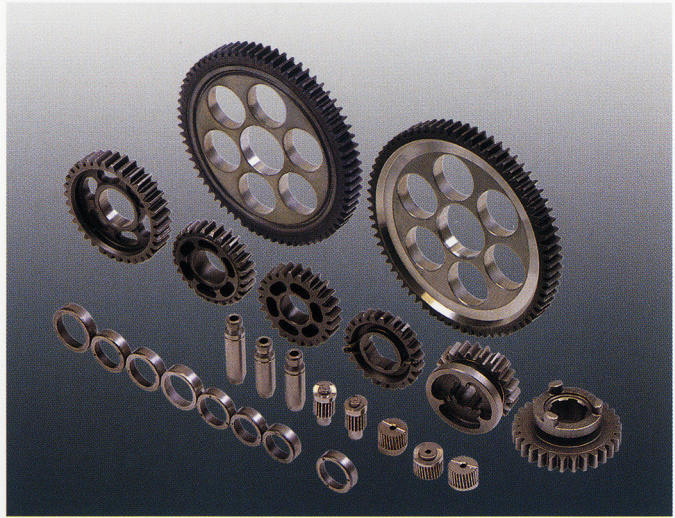
Ferrous Alloys / 일반구조용자재

Material designation 재료기호	Density(Body) 밀도(전체) (g/cm ³)	Hardness (Surface) 경도(표면) (Hv=10)	기계적 성질 Mechanical properties					
			0.2% Offset 0.2% 내력 MPa (Kg f/mm ²)	Tensile strength 인장강도 MPa (Kg f/mm ²)	Elongation 신율 (%)	Charpy impact energy Charpy 충격치 J/mm ² (Kgfm/cm ²)	Young's modulus Young율 MPa (Kg/mm ²)	Fatigue strength 피로강도 MPa (Kg/mm ²)
SMF4020M	6.2~6.6	60 min	137 min (14 min)	196 min (20 min)	1.0 min	2.9 min (0.3 min)	98067(10000)	78(8)
↑ STEAM	6.3~6.7	120 min	-	196 min (20 min)	0.2 min	1.0 min (0.1 min)	137294(14000)	78(8)
SMF4025M	6.2~6.6	70 min	177 min (18 min)	245 min (25 min)	1.0 min	2.9 min (0.3 min)	98067(10000)	98(10)
↑ STEAM	6.3~6.7	130 min	-	25 min (25 min)	0.2 min	1.0 min (0.1 min)	137294(14000)	98(10)
SMF4030M	6.6~7.0	80 min	196 min (20 min)	294 min (30 min)	2.0 min	4.9 min (0.5 min)	127487(13000)	118(12)
↑ STEAM	6.7~7.1	130 min	275 min (28 min)	294 min (30 min)	0.5 min	2.0 min (0.2 min)	166714(17000)	118(12)
SMF4035M	6.6~7.0	90 min	265 min (27 min)	343 min (35 min)	1.2 min	3.9 min (0.4 min)	127487(13000)	147(15)
↑ STEAM	6.7~7.1	140 min	324 min (33 min)	343 min (35 min)	0.5 min	2.0 min (0.2 min)	166714(17000)	147(15)
SMF4040M	6.6~7.0	100 min	294 min (30 min)	392 min (40 min)	1.2 min	3.9 min (0.4 min)	127487(13000)	167(17)
↑ STEAM	6.7~7.1	150 min	373 min (38 min)	392 min (40 min)	0.5 min	2.0 min (0.2 min)	166714(17000)	167(17)

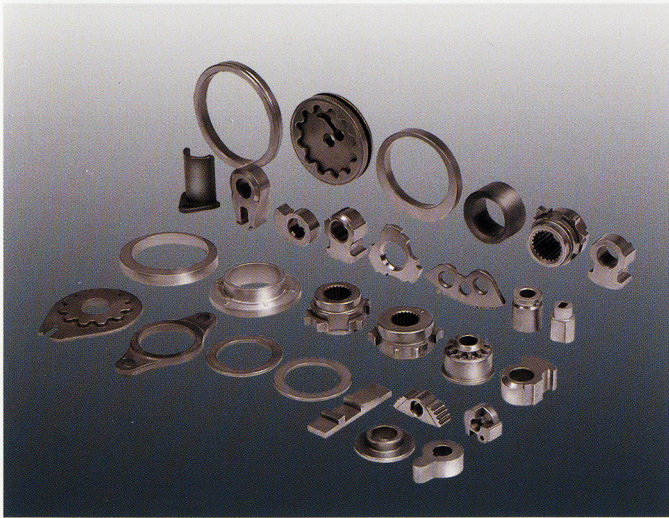




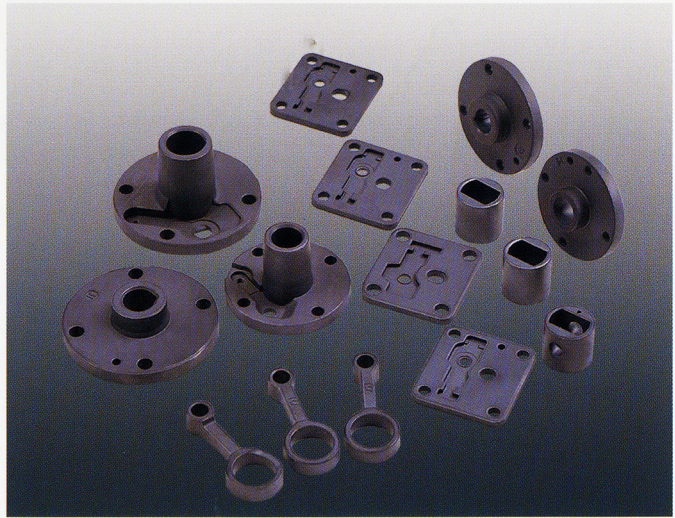
Automobile parts for auto T/M



Motor cycle parts



High-strength parts



Compressor parts

High-strength / 고강도 재료

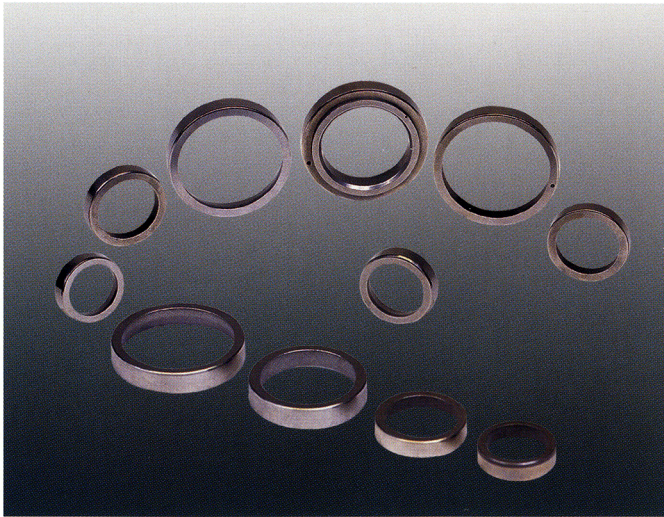
기계적 성질 Mechanical Properties

Material designation 재료기호	Density(Body) 밀도(전체) (g/cm ³)	Hardness (Surface)경도(표면) (Hv=10)	0.2% Offset 0.2% 내력 MPa (Kg f/mm ²)	Tensile strength 인장강도 MPa (Kg f/mm ²)	Elongation 신율 (%)	Charpy impact energy Charpy 충격치 J/mm ² (Kgfm/cm ²)	Young's modulus Young율 MPa (Kg/mm ²)	Fatigue strength 피로강도 MPa (Kg/mm ²)
SMF4050M	6.7~7.1	120 min	373 min (38 min)	490 min (50 min)	1.2 min	3.9 min (0.4 min)	127487 (13000)	177 (18)
↑ STEAM	6.8~7.2	170 min	441 min (45 min)	490 min (50 min)	0.5 min	2.0 min (0.2 min)	166714 (17000)	177 (18)
SMF8030M	6.8~7.2	70 min	196 min (20 min)	294 min (30 min)	2.0 min	9.8 min (1.0 min)	127487 (13000)	118 (12)
SMF9035M	6.8~7.2	150 min	294 min (30 min)	343 min (35 min)	1.0 min	3.9 min (0.4 min)	127487 (13000)	167 (17)
↑ STEAM	6.9~7.3	160 min	273 min (33 min)	343 min (35 min)	0.2 min	2.0 min (0.2 min)	166714 (17000)	167 (17)
SMF9060M	7.0~7.3	200 min	392 min (40 min)	588 min (60 min)	1.5 min	24.5 min (2.5 min)	137294 (14000)	177 (18)
↑ STEAM	7.05~7.35	210 min	539 min (55 min)	588 min (60 min)	1.0 min	2.0 min (0.2 min)	166714 (17000)	177 (18)
SMF9070M	7.55~7.85	200 min	588 min (60 min)	784 min (80 min)	10 min	34.3 min (3.5 min)	205940 (21000)	255 (26)

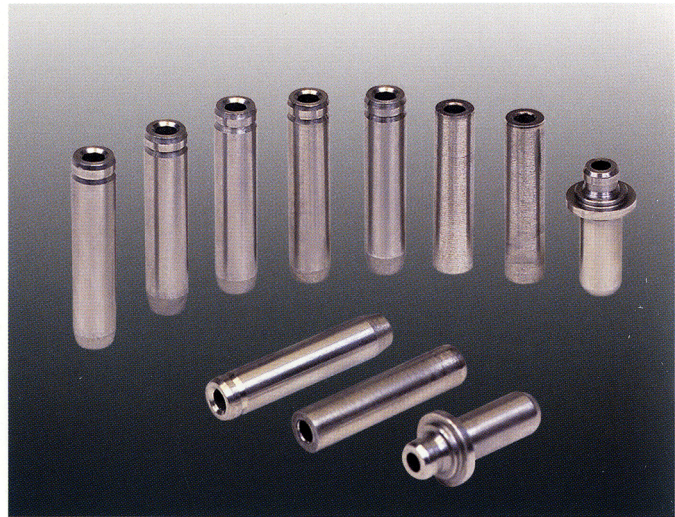
Wear-Resistance

내열, 내마모부품

P/M typically uses more than 97% of the starting raw material in the finished Part → multi-level compaction technology



Valve seat for engine



Valve guide

Valve Seat / 내열재료

Kind 종류	Material designation 재료기호	Hardness 경도		Density 밀도 (g/cm ³)	Radial crushing Strength 압축하중 N (kgf) (3)	비고
		HR	Hv(30)			
IN 흡기용	A TC-1	B 90±10	200±50	6.7~7.0	588(60) min	-
	C W-6D	B 90±10(1), B 85±15(2)	200±50(1), 130 min(2)	6.7~7.0	(62) min	Two layer alloy - 2층 합금
	D W-8E	B 90±10(1), B 85±15(2)	200±50(1), 130 min(2)	6.7~7.0	981(100) min	Two layer alloy, Water glass impregnation-2층 합금, 물유리 함침
	E W-8D	B 90±10(1), B 85±15(2)	200±50(1), 130 min(2)	6.7~7.0	981(100) min	Two layer alloy - 2층 합금
EXH 배기용	D W-20DC	-	290~460(1), 80~210(2)	6.6~7.2	981(100) min	Two layer alloy, Infiltration - 2층 합금, 동용침
	E W-22MD	B 90±10(1), B 85±15(2)	200±50(1), 130 min(2)	6.7~7.0	981(100) min	Two layer alloy - 2층 합금
	F W-22MC	A 65~71(1), A 60~71(2)	300~390(1), 220~380(2)	7.4~8.0	2453(250) min	Two layer alloy, Infiltration - 2층 합금, 동용침
	G W-23D	B 95±10(1), B 85±15(2)	200±50(1), 130 min(2)	6.7~7.0	981(100) min	Two layer alloy, - 2층 합금
	H W-23CD	A 65~72(1), A 50~72(2)	300~400(1), 200~400(2)	7.5~8.1	1177(120) min	Two layer alloy, Infiltration - 2층 합금, 동용침
	I W-24D	B 90±10(1), B 85±15(2)	200±50(1), 130 min(2)	6.7~7.0	981(100) min	Two layer alloy, - 2층 합금
	J W-24CD	B 65~72(1), B 50~72(2)	300~400(1), 200~400(2)	7.5~8.1	1177(120) min	Two layer alloy, Infiltration - 2층 합금, 동용침
K W-24PD	A 55~75(1), A 45~65(2)	200~400(1), 130 min(2)	8.0~8.6	981(100) min	Two layer alloy, Lead impregnation - 2층 합금, 납함침	

Valve Guide / 내마모 재료

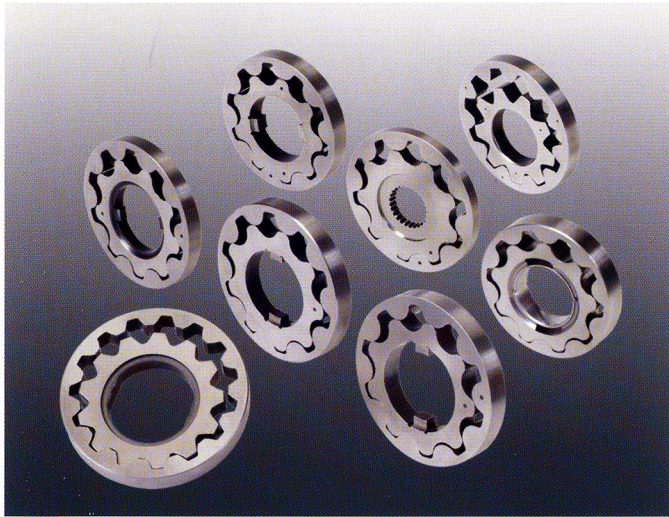
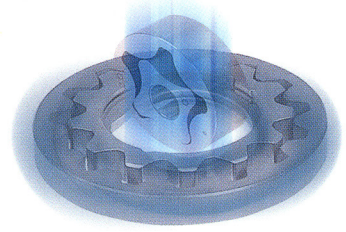
Material designation 재료기호	Density 밀도 (g/cm ³)	Hardness (Surface) 경도 (HR)	Tensile strength 인장강도 (Kg f/mm ²)	Elongation 신율 (%)	Charpy impact energy Charpy 충격치 (Kg f.m/cm ²)	Refence 비고
HVG 71	6.4	63	25	0.2	0.1	JIS상당재질 - Equivalent to JIS material



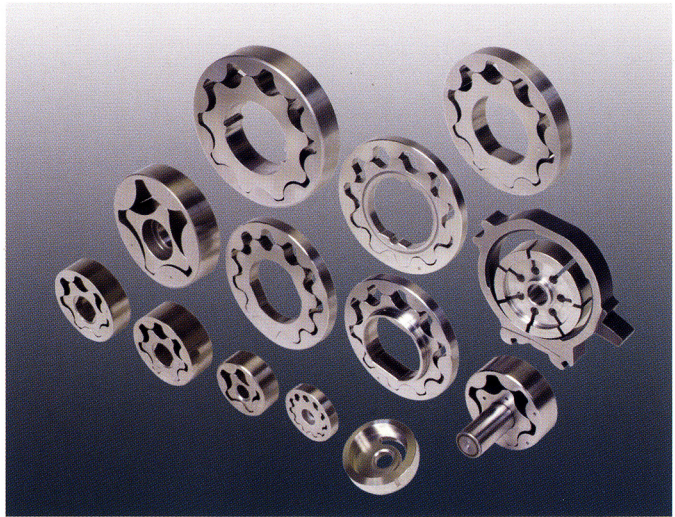
Oil Pump Gear

오일펌프 기어부품

- Parachoid
- SD Choid
- Megafloid
- Trochocentric
- Duocentric, Duocentric-I/C, etc.



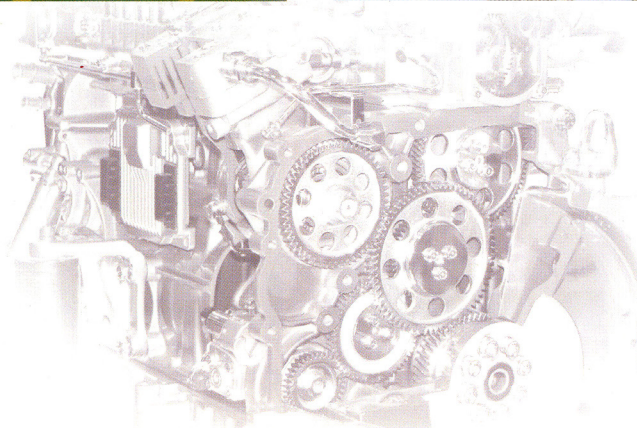
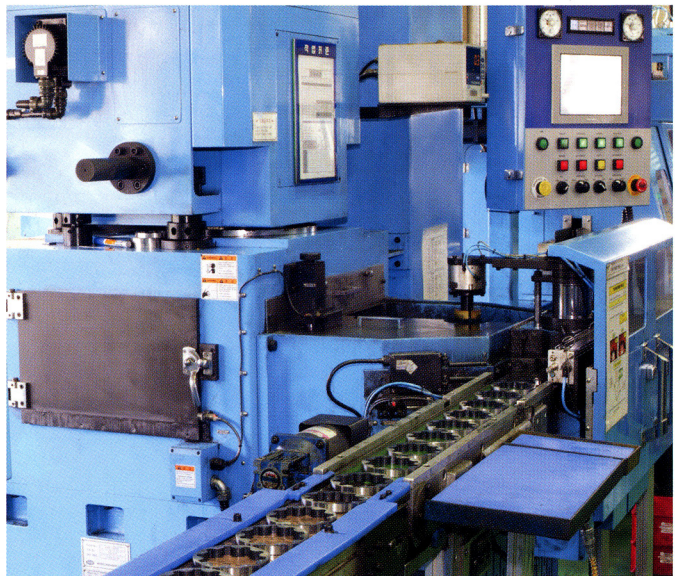
Oil pump gear for auto T/M



Oil pump gear for engine



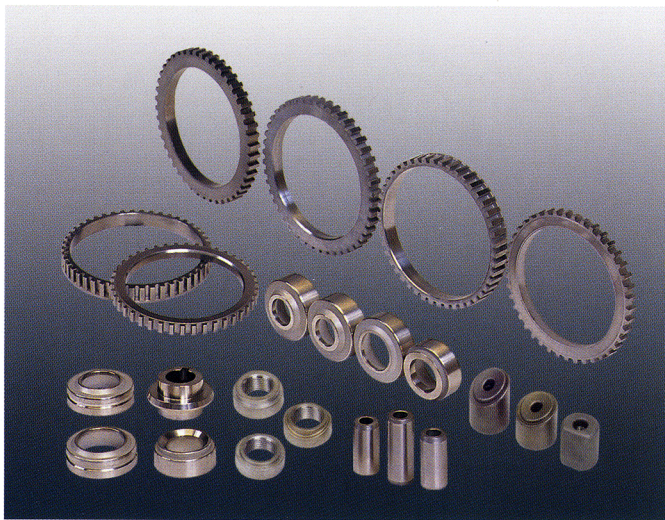
Oil pump machining line



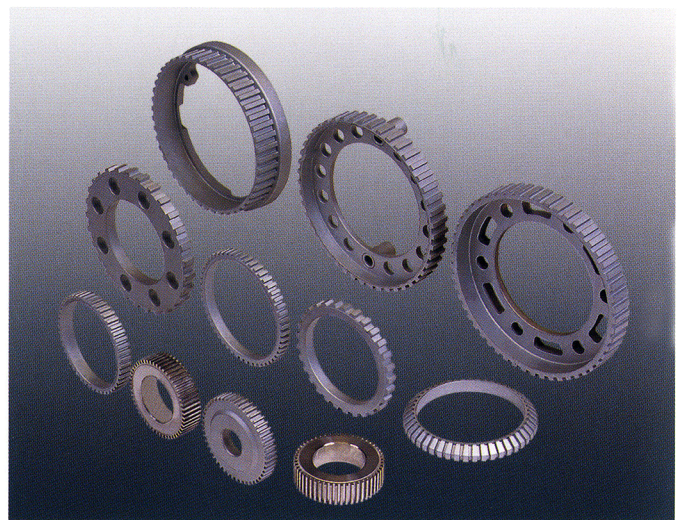


Stainless, ABS Ring

특수재질, 연자성부품, 오일레스베어링



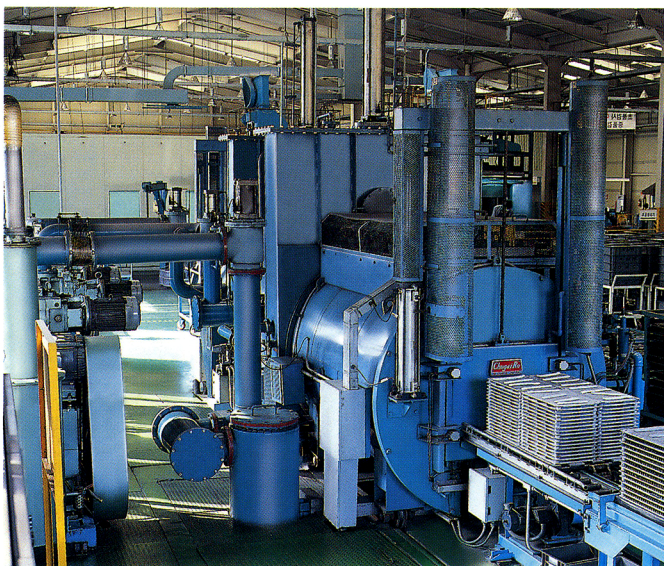
SUS material parts



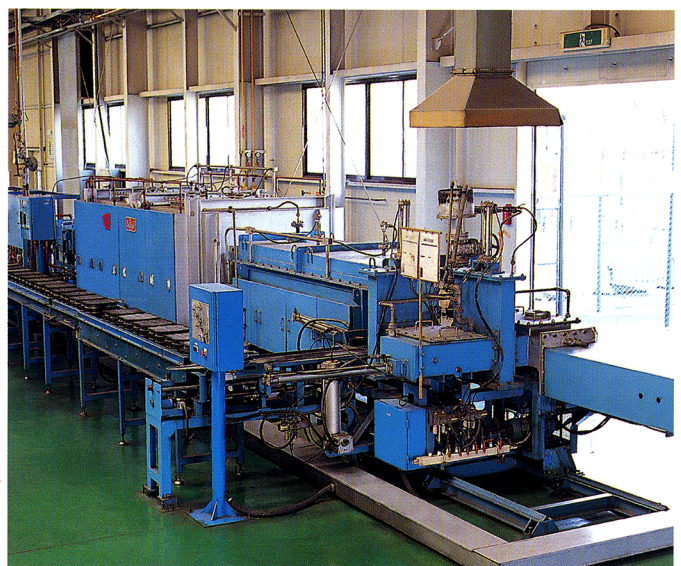
ABS ring

Soft Magnetic Material / 연질자성 재료

Material designation 재료기호	Density(Body) 밀도 (g/cm ³)	Hardness (Surface)경도 (Hv10)	Tensile strength 인장강도 (Kg f/mm ²)	Elongation 신율 (%)	Max, magnetic induction 최대자속밀도 at H25, Tesla (Gauss)	Remnant Magnetic Induction 잔류자속밀도 Tesla (Gauss)	Coercive 보자력 A / m (Oe)	Max, permeability 최대투자율 μ
HSMM 1015	6.8 min	40 min	150 (15) min	5 min	0.9 min (9,000)	0.7 min (7,000)	395 max (5 max)	2,000 min
HSMM 1020	7.0 min	60 min	200 (20) min	5 min	0.9 min (9,000)	0.7 min (7,000)	395 max (5 max)	2,000 min
HSMM-P45	7.0 min	110 min	350 (35) min	8 min	0.9 min (9,000)	0.7 min (7,000)	315 max (4 max)	2,500 min



Vacuum furnace

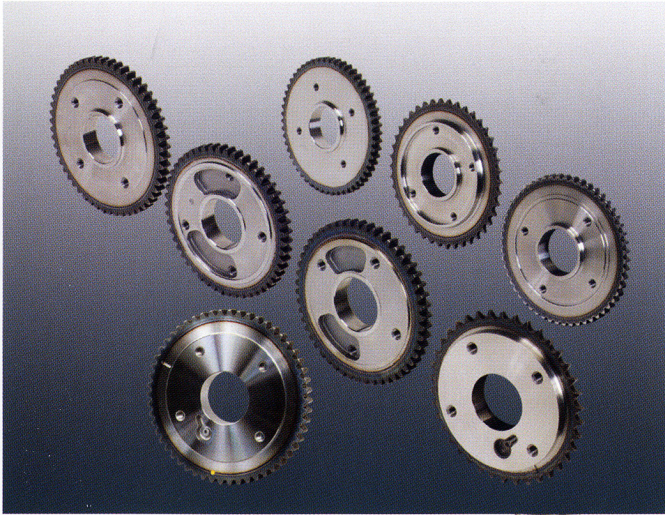
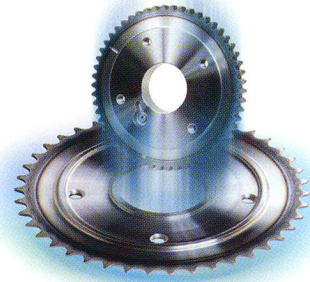


High temperature furnace

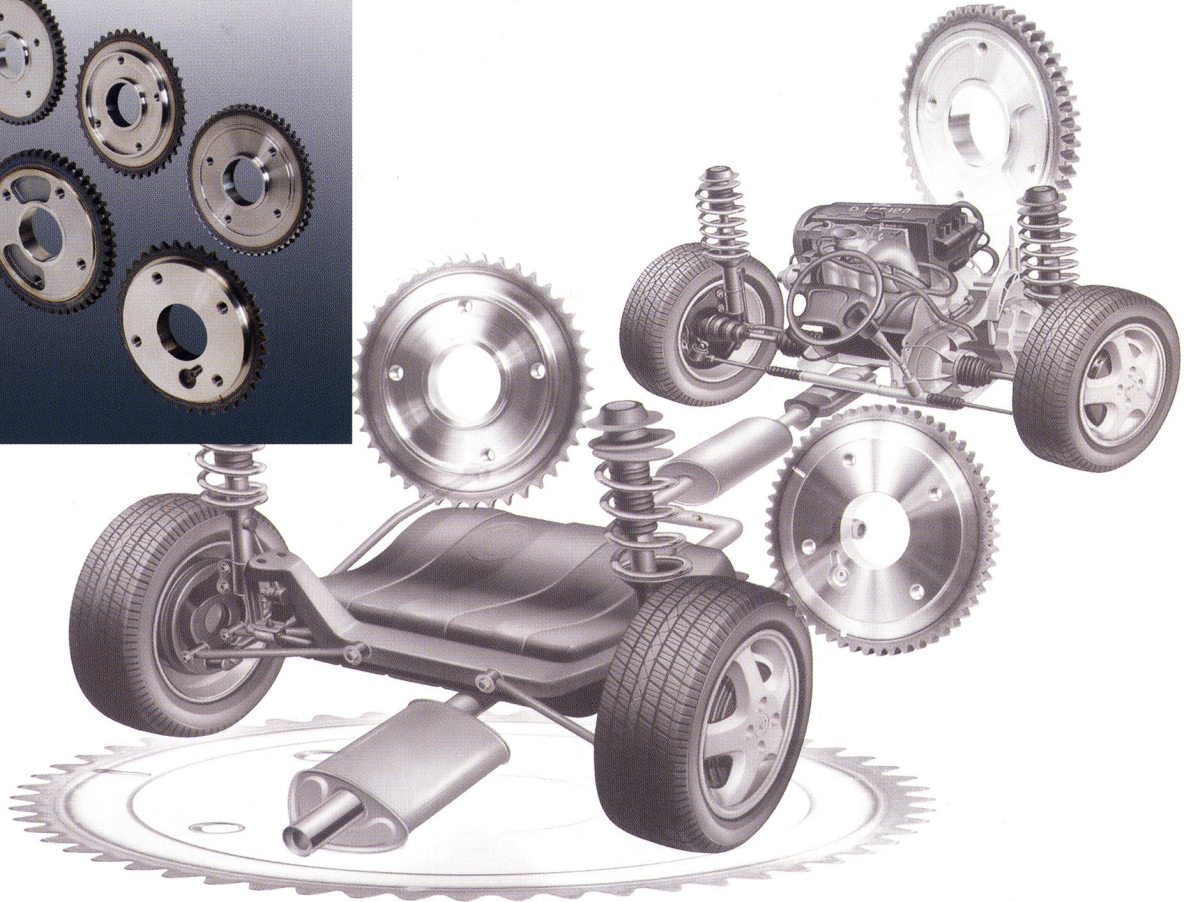


Sprocket

스프라켓류



Sprocket

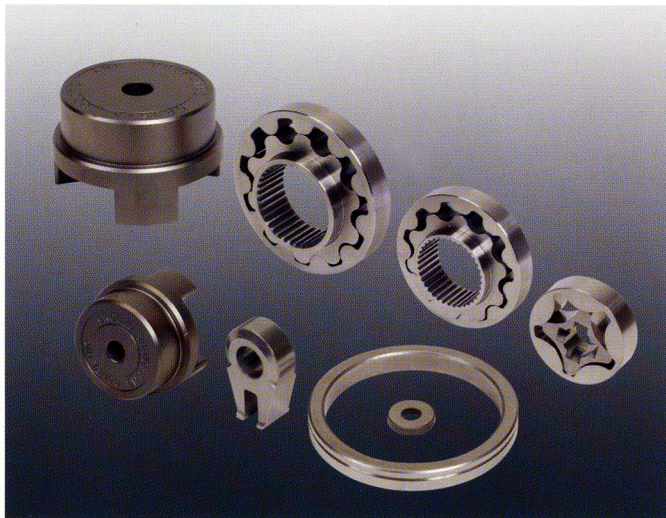


Sprocket machining line

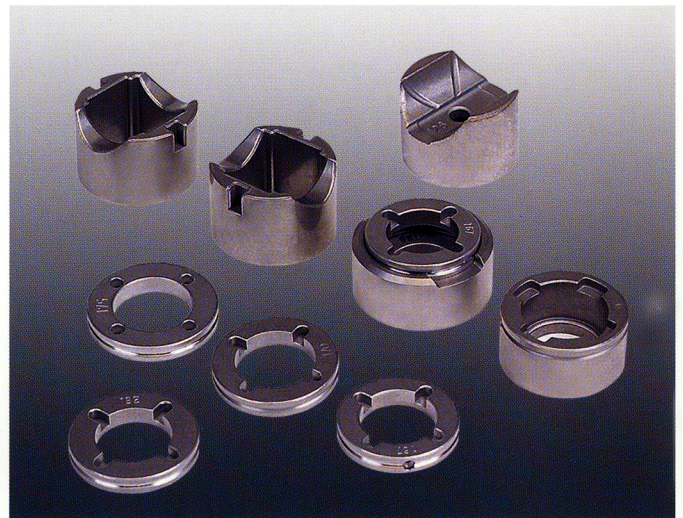


Others

기타

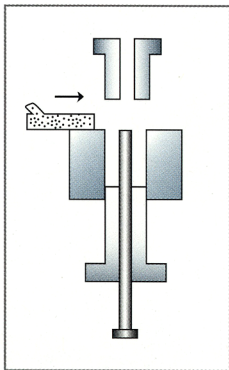


Industrial machines & farm machinery parts

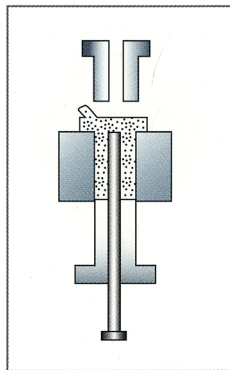


Power steering parts

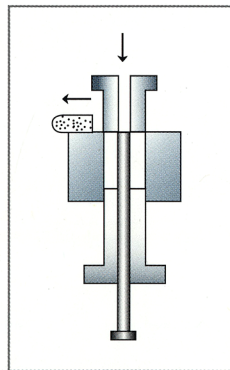
Compacting



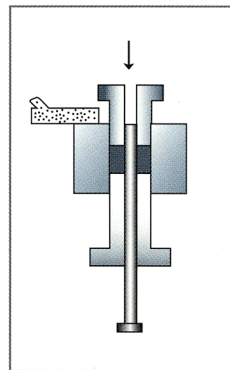
① Cycle start



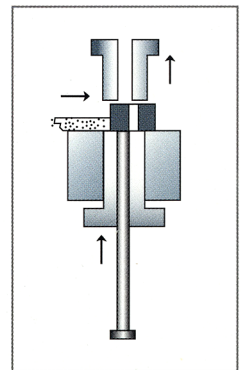
② Charging (filling) die with powder



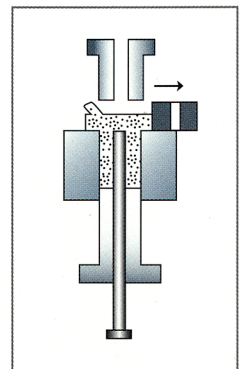
③ Compaction begins



④ Compaction completed



⑤ Ejection of part

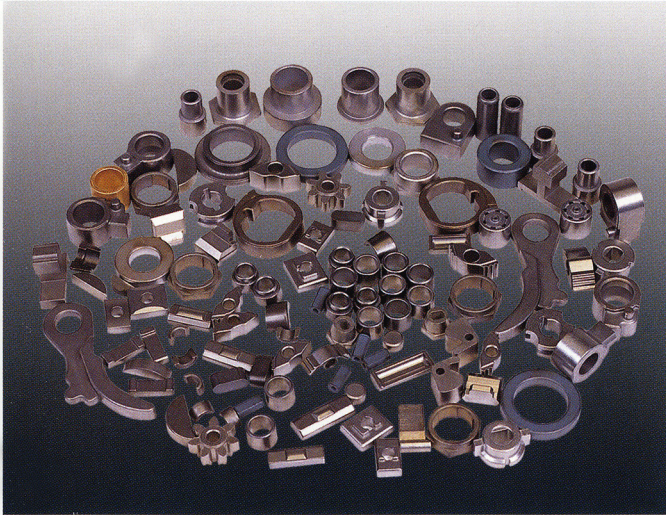


⑥ Recharging die

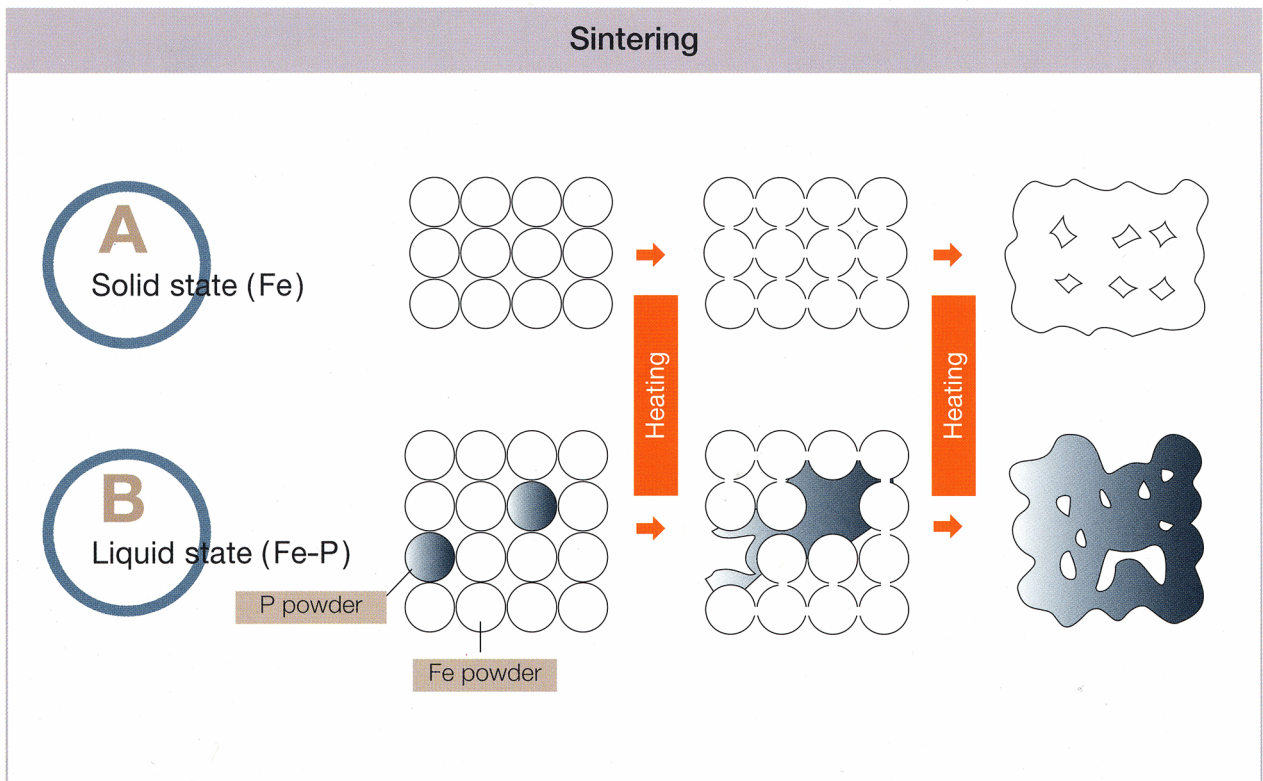


Advantages of the P/M process

- ① Suited to moderate-to high volume component production requirements.
- ② Facilitates manufacture of complex or unique shapes.
- ③ Provides materials which may be heat-treated for increased strength or increased wear resistance.
- ④ Produces good surface finishes.
- ⑤ Maintains close dimensional tolerances.
- ⑥ Permits a wide variety of alloy systems.
- ⑦ Eliminates or minimizes machining and scrap.
- ⑧ Provides controlled porosity for self-lubrication or filtration.
- ⑨ Cost reduction.
- ⑩ Conserves energy and materials.



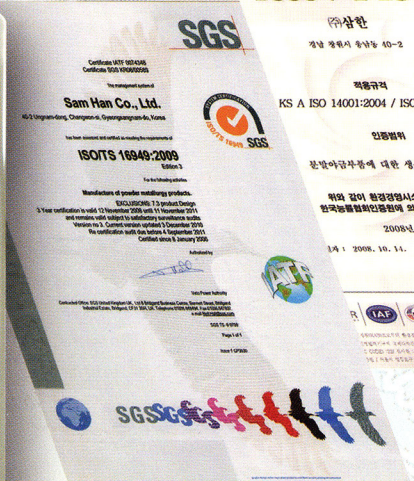
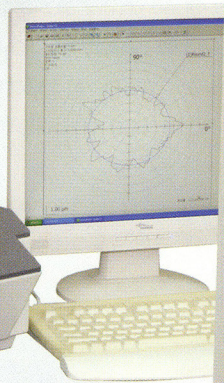
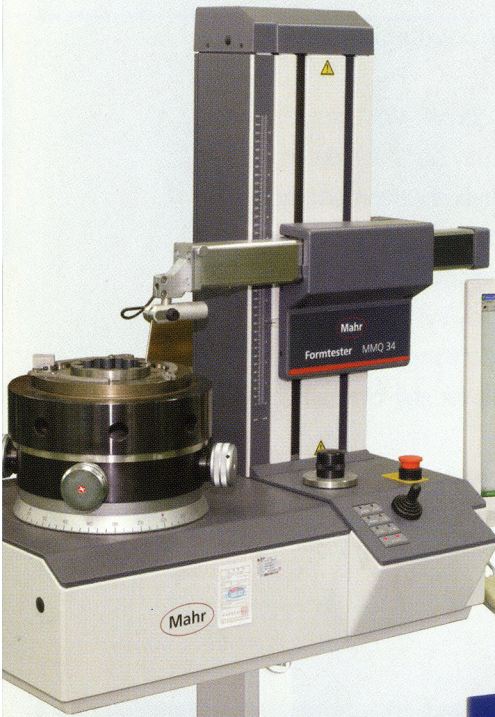
Others



Quality-Assurance

품질보증

Samhan acquired the ISO 14001 and ISO / TS 16949 certificates.



환경경영시스템 인증서

주식회사 삼한
경남 창원시 송남동 40-2

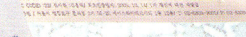
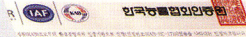
적용규격
KS A ISO 14001:2004 / ISO 14001:2004

인증범위
분말아교분말용에 대한 생산 및 부가서비스

취득 일자 환경경영시스템 규격에 적합함이
한국능률협회인증원에 의해 인증되었음을 증명함.

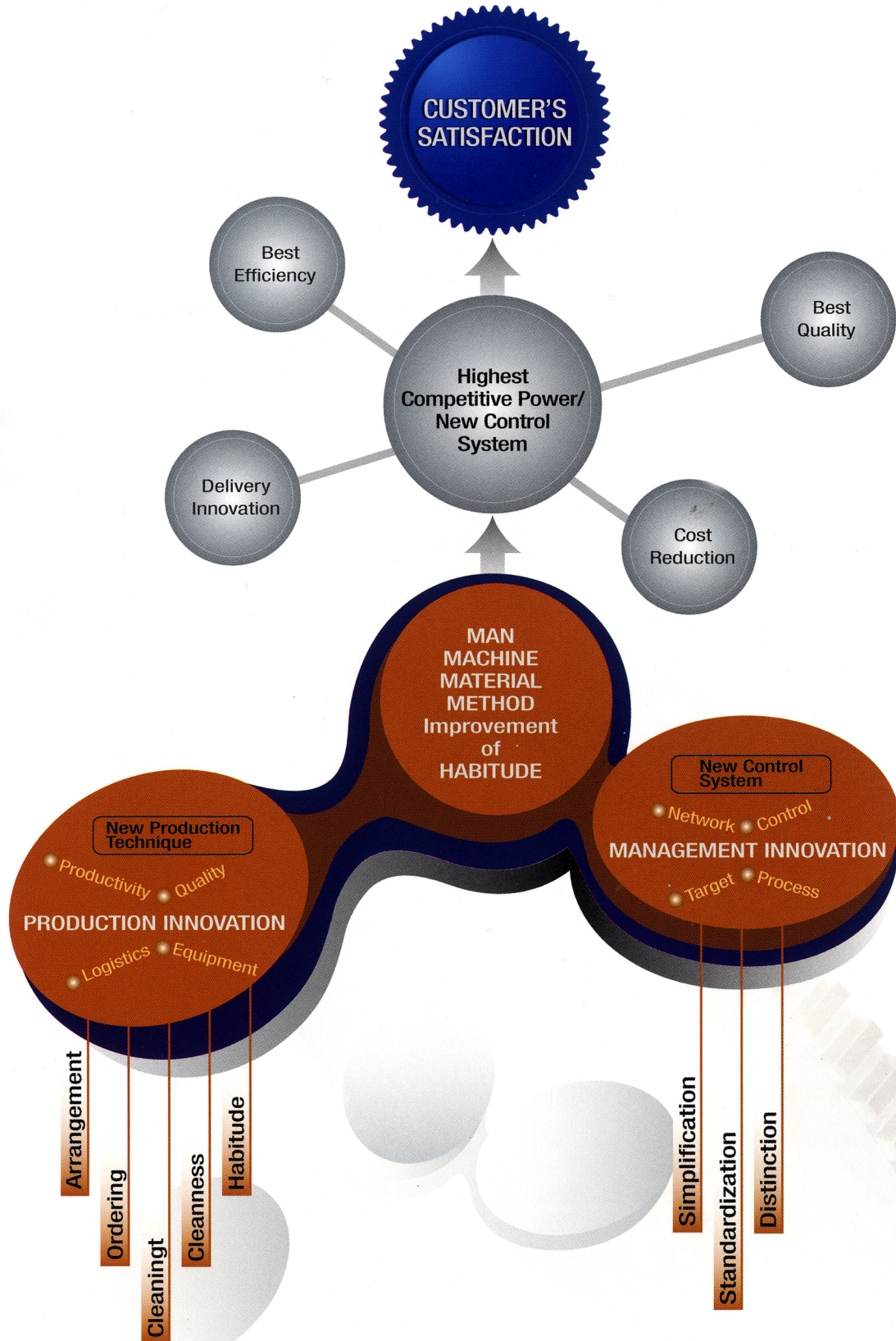
2008년 10월 13일

1호 | 2008. 10. 13. 인증번호/호 : 2011. 10. 13.





SAMHAN, which has been pursued excellent quality confidence, has multistep perfect quality assurance system with new various inspection equipments and keeps on trying processing management to realize customer's satisfaction.



R&D Center

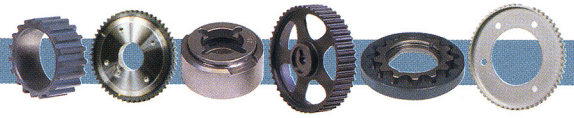
기술개발

SAMHAN guarantee the competitiveness and the quality for customers.
SAMHAN R&D CENTER will be with you all the time!



**If you have interesting P/M parts,
Please let me know the following details.**

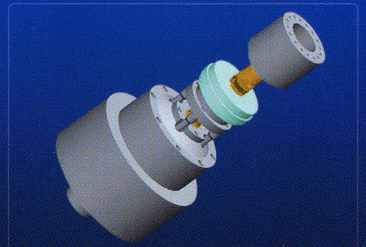
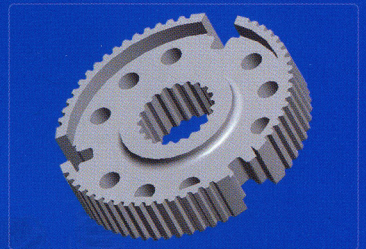
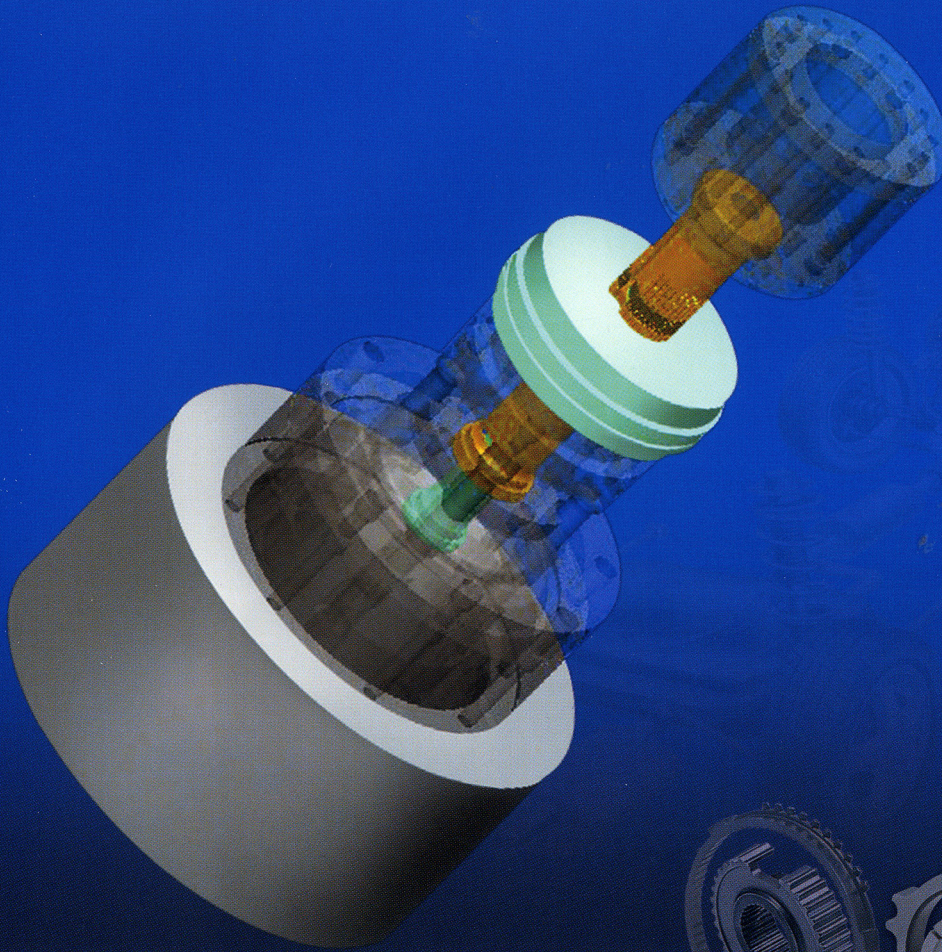
- Size, Shape & approximate weight
- Estimated annual purchase quantities
- What are the critical physical & mechanical properties
(Tensile strength, Fatigue strength, Magnetic, Corrosion resistance, etc.)
- What material or alloy system currently being used.



SAMHAN is always with you, do not hesitate contact us!

With the optimum 3D modeling design system, the creative and reasonable process planning, SAMHAN guarantee the best cost, the highest quality reliance, the delivery conformity that perfectly satisfying all customer's needs.

고객과 함께하는 기술연구소! 상담을 주저하지 마십시오. 3D모델링에 의한 최적의 형상설계, 합리적이고 창조적인 공정설계를 통하여 여러분의 가격경쟁력을 향상시키고 목표설계에 의한 품질지수(6σ) 개선 및 개발일정 준수에 의한 고객만족을 여러분과 함께 합니다.



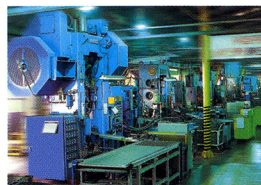
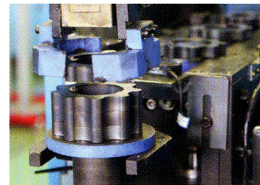
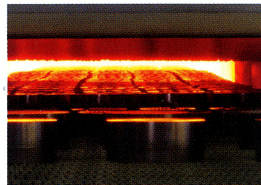
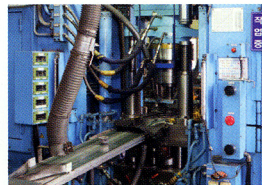
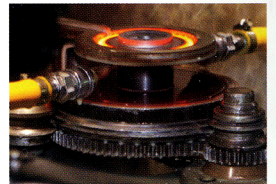
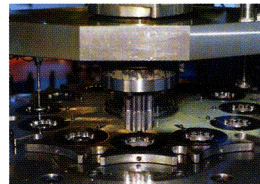
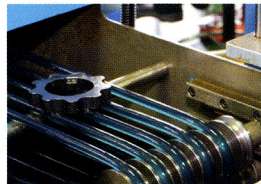
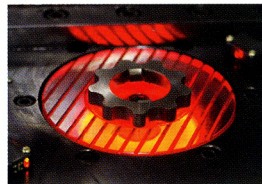
been retrieved.



Company Information

회사소개

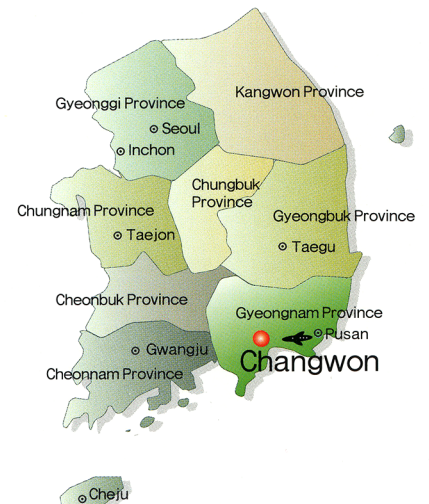
Site/Floor area → 26,400m²/11,900m²



Company History

연혁

- 1975. 08. Samhan Co., Ltd. founded
- 1979. 10. Completion of the Changwon plant (began sintered product)
- 1983. 03. Affiliated with HMC for sintered automobile parts
- 1983. 08. Established corporate partnership with Mitsubishi Material Co., Ltd. (MMTL) for the production of sintered automobile parts
- 1994. 09. Established the R&D center
- 2003. 01. M&A with Korea Sintered Metal Co., Ltd. (KSM)
- 2003. 04. Established corporate partnership with Sumitomo Electric Industries Ltd. for the production of sintered automobile parts
- 2005. 12. Obtained ISO/TS16949





Based on respect for human life and our
customers the best products will be produced.

인간 존중과 고객우선을 바탕으로 최고의 제품을 생산하겠습니다.





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주식회사 삼한

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Fax: +82-55-282-0144, 0844

Homepage : www.samhan.biz/www.samhanltd.co.kr

E-mail : samhan@samhan.biz

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Tel : 055-285-0041~4

Fax: 055-282-0144, 0844

Seoul Office

162, Kiajadongcha-ro, Ujeong-eup, Hwaseong-si, Gyeonggi-do, 18570, Republic of Korea

경기도 화성시 우정읍 기아자동차로 162 (매항리 834-19) 18570

Mobile : +82-10-2087-5837, 010-2087-5837