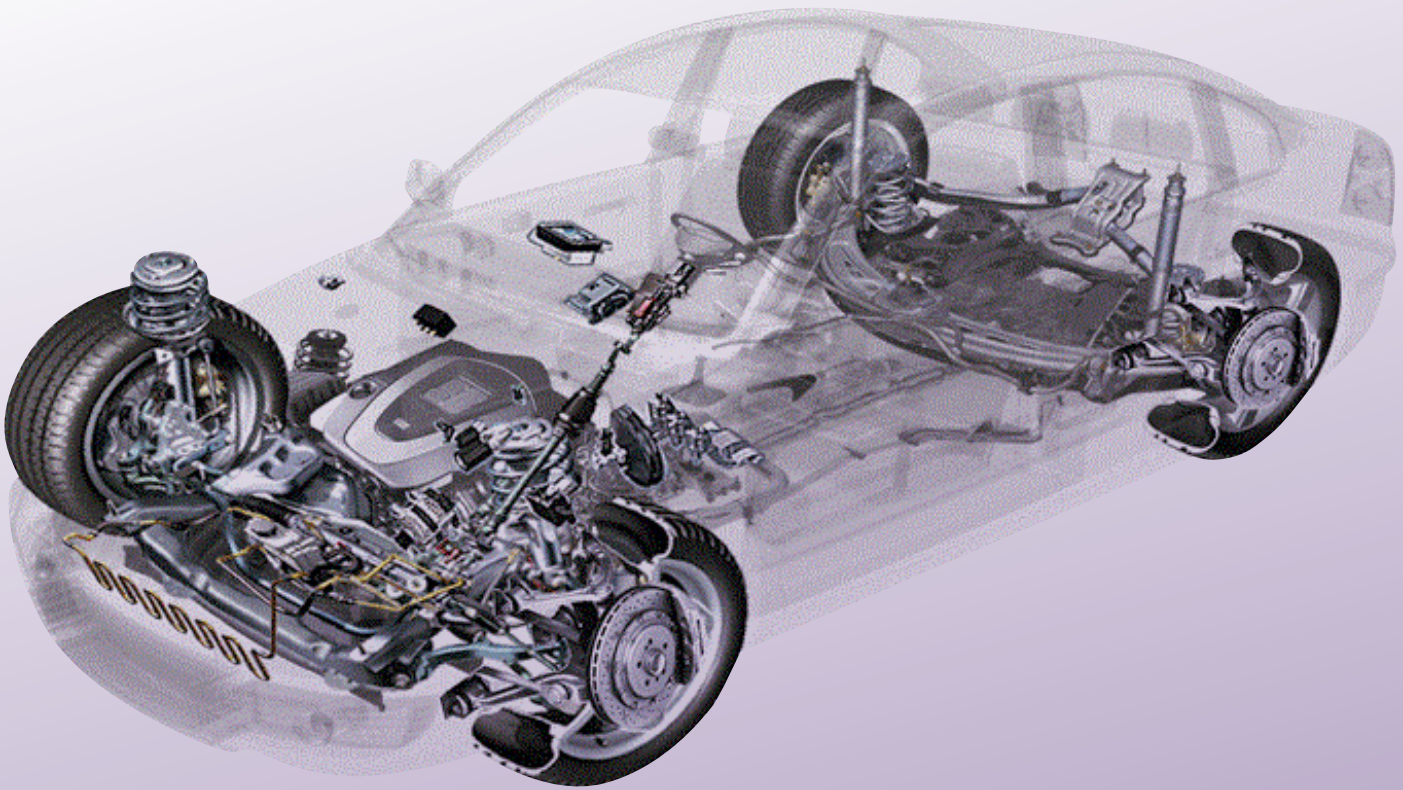
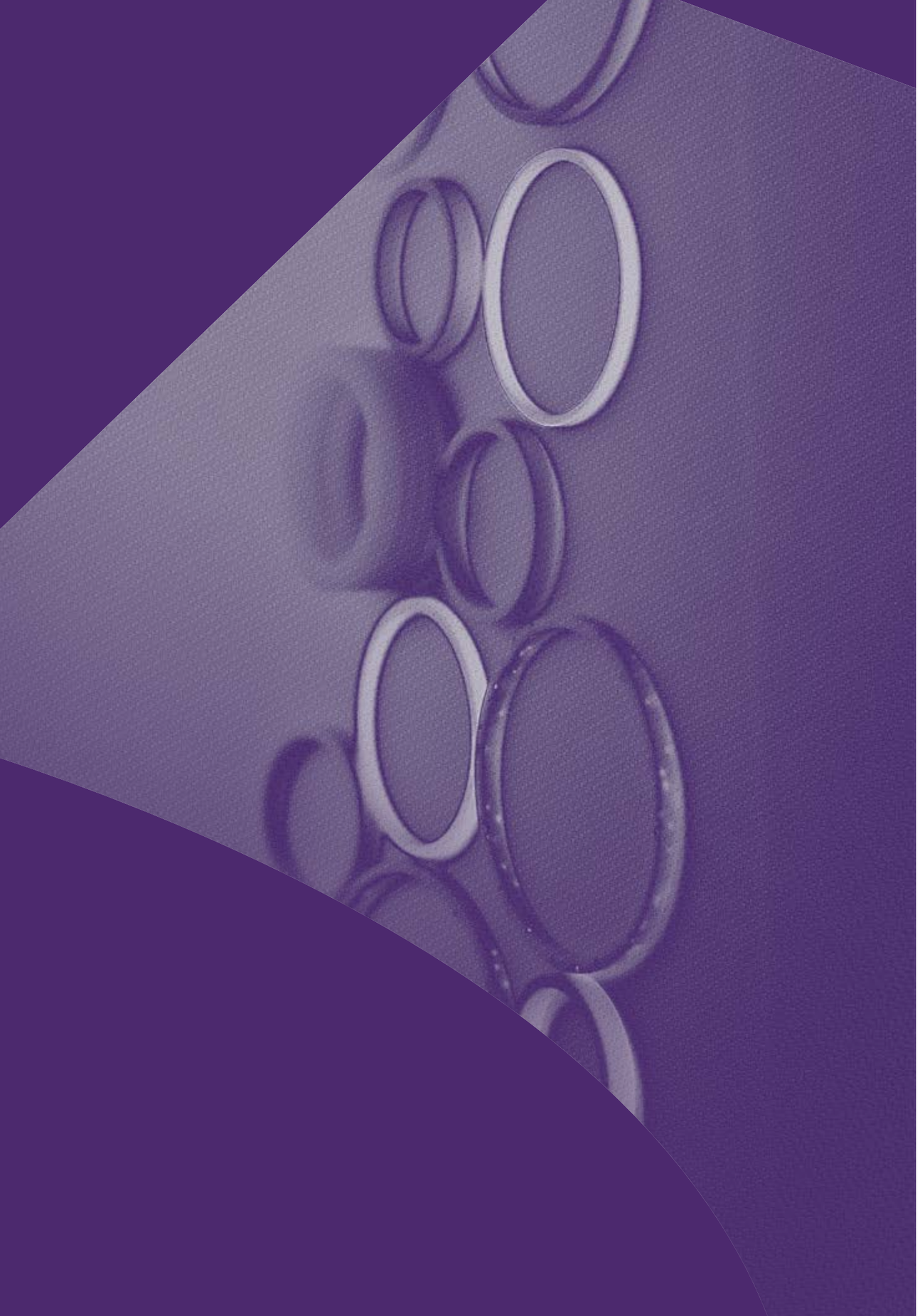
AUTOMOBILE & PRECISION PART



FOOSUNG



INTRODUCTION & FEATURES

후성정공㈜의 AUTOMOBILE VALVE SEAL은 자동차 차세대 엔진(통합유량제어 멀티밸브) 등에 적용되는 내열성·내화학성 SEALING 소재로서 엔지니어링플라스틱 및 고순도 컴파운드 원료를 개발하여 우수한 품질의 제품을 생산중이며, 정밀가공 및 SEALING을 필요로 하는 국내·해외 차량엔진에 적용하고 있습니다. 당사에서는 친환경 및 전기,수소차 등 첨단엔진 냉각계통 2 WAY, 3WAY VALVE의 Seal 제품을 생산하고 있으며, 고객사에서 요구하는 기계, 열, 전기적 성질을 만족하기 위하여, 원료컴파운드를 통한 지속적인 신소재 개발로 고품질의 제품을 공급하고 있습니다.

The AUTOMOBILE VALVE SEAL of Foosung Precision Ind. Co., Ltd. is a heat-resistant and chemical-resistant sealing material applied to next-generation automobile engines (integrated flow control multi-valves), etc.
We are developing engineered plastics and high-purity compound raw materials to produce high-quality products, and are applying them to domestic and overseas vehicle engines that require precision processing and sealing.
Our company produces seal products for 2-way and 3-way valves for cutting-edge engine cooling systems such as eco-friendly and electric and hydrogen vehicles, and in order to satisfy the mechanical, thermal, and electrical properties required by customers, we are supplying high-quality products through the development of new materials through raw material compounds.

厚成精工株式会社的汽车气门密封圈（AUTOMOBILE VALVE SEAL）是一款适用于新一代汽车发动机（集成流量控制多阀）等的耐热耐化学性密封材料。
我们致力于开发工程塑料和高纯度复合材料原料，生产高品质产品，并将其应用于国内外需要精密加工和密封的汽车发动机。
我公司生产用于环保汽车、电动汽车和氢动力汽车等尖端发动机冷却系统的二通阀和三通阀密封圈产品，为了满足客户对机械性能、热性能和电气性能的要求，我们通过从原材料复合材料到新材料的开发，不断提供高品质产品。

Foosung Precision Industryの AUTOMOBILE VALVE SEALは、自動車次世代エンジン（統合流量制御マルチバルブ）などに適用される耐熱性・耐化学性SEALING素材として、エンジニアプラスチックおよび高純度COMPOUND原料を開発し、優れた品質の製品を生産中であり、精密加工およびSEALINGを必要とする国内・海外車両。
当社では、環境にやさしい電気、水素車など先端エンジン冷却系2WAY、3WAY VALVEのシール製品を生産しており、お客様から求められる機械、熱、電気的性質を満足するため、原料コンパウンドによる新素材開発で高品質の製品を供給しています。

AUTOMOBILE PART

Multi Valve Seal

Applicated Material	Compounded PTFE

통합유량제어밸브 ITM

엔진냉각시스템에 적용되는 부품으로써 ECU의 신호를 받아 Ball Valve가 회전하여 유량 조절을 하는 과정에 접합한 Seal Ring 제품으로 뛰어난 내열성과 내마모성으로 자동차 엔진의 수명연장 역할을 하고 있습니다.

As a component applied to the engine cooling system, this is a Seal Ring product that is joined in the process of receiving signals from the ECU and rotating the Ball Valve to control the flow rate.
It plays a role in extending the life of the automobile engine with its excellent heat resistance and wear resistance.

该产品是应用于发动机冷却系统的部件。它是一种密封圈产品，适用于通过响应ECU信号旋转球阀来控制流量的过程。凭借其优异的耐热性和耐磨性，它有助于延长汽车发动机的使用寿命。

この製品はエンジン冷却システムに適用される部品で、ECUの信号を受けてBall Valveが回転して
流量調整を行う過程に適したシールリング製品で、優れた耐熱性と耐摩耗性で自動車エンジンの寿命延長として機能しています。

Electric Compressor Seal (SHAFT SEAL)

Applicated Material	Compounded PTFE

전동컴프레샤 Seal

자동차 전동 컴프레샤 스크류의 강한 회전에 의한 마모 발생 방지 역할과 발생되는 높은 압력 제어와 유출을 방지하는 역할을 하고 있습니다.

This product prevents wear caused by strong rotation of the screw of an automobile electric compressor, controls high pressure generated, and prevents leakage.

本产品可防止汽车电动压缩机螺杆因强力旋转而产生的磨损，控制产生的高压，并防止泄漏。

この製品は、自動車電動コンプレッサーのスクリューの強い回転による摩耗防止や 発生する高い圧力制御と流出を防止する役割をしています。

PTFE Ring (Piston Ring / Guide Ring / Bush)

Applicated Material	PTFE (Glassfiber Blended)

자동차 조향장치(Steering) 부품으로 유량제어 및 회전구간에 특화되었으며 특히 NPS 타입의 파워스티어링에 적용중인 피스톤링은 최고온도 150℃에서 변형없이 균일한 압력을 전달하는 목적으로 Rack Bar/실린더 안에 조립됩니다.

The piston ring used in automobile steering devices, especially NPS type power steering, is assembled inside the rack bar/cylinder for the purpose of transmitting uniform pressure without deformation at a maximum temperature of 150℃.

汽车转向装置，特别是NPS型动力转向装置中所使用的活塞环，装配在齿条/油缸内，其目的是在最高温度为150℃时，传递均匀的压力而不变形。

本製品は自動車のステアリング部品で、流量制御および回転区間に特化されており、特にNPSタイプのパワーステアリングに適用中のピストンリングは、最高温度150℃で変形なく均一な圧力を伝達する目的で、Rack Bar/シリンダ内に組み立てられます。

Back up Ring

Applicated Material	Compounded PTFE

Piston Ring과 더불어 조향장치에 쓰이며, 트럭/버스등의 대형차 기어박스의 Sliding Seal 및 Backup Ring으로 기계적 강도를 더욱 요구하는 부품이기도 합니다.

This is used in steering devices along with piston rings, It is a part that requires mechanical strength as a sliding seal and backup ring for gearboxes of large vehicles such as trucks and buses.

它与Piston Ring一起用于转向装置，是卡车和公共汽车等大型车辆变速箱的滑动密封和支承环，需要机械强度的零件。

Piston Ringとともに操舵装置に使われており、トラック/バスなどの大型車ギアボックスの 襲撃SealおよびBackup Ringで機械的強度をさらに要求する部品でもあります。

RESIN PROPERTIES (VERGIN & COMPOSITION)

Item		Unit	ASTM	PROPERTICES							PROPERTICES													
Filler %		%		Vergin PTFE	Glass Fiber 15%		Glass Fiber 20%		Glass Fiber 25%		GF 20% Graphite 5%		GF 15% MoS2 5%		Bronze 60%		Graphite 15%	Carbon13 Graphite2	Carbon/Graphite 25%		Carbon/Graphite 33%		Carbon Fiber 10%	
Density		g/l	D 1457	260	370	800	370	800	430	800	400	800	400	800	920	1400	760	704	360	730	370	730	340	750
Specific gravity		-	D 792	2.13	2.24	2.23	2.26	2.24	2.27	2.26	2.24	2.23	2.29	2.29	3.95	3.91	2.17	2.131	3.95	3.91	2.05	2.05	2.09	2.09
Tensile strength		Mpa(kgf/㎠)	D 638	30.9(315)	25(255)	23.0(235)	25(255)	20.5(210)	20.1(205)	18.6(190)	19.6(200)	14.7(150)	21.6(220)	18.1(185)	1.96(200)	18.1(185)	15.7(160)	22.1	19.6(200)	18.1(185)	15.7(160)	13.2(135)	24.0(245)	19.6(200)
Elongation		%	D 638	400	330	320	305	300	285	280	300	235	320	280	220	215	230	306	100	55	35	15	300	200
60min	MD	%	D 621 13.72MPa (23℃,140kgf/㎠)		6.6		5.5		5.2		3.9		4.6		3.2		5.2		3.4		1.9		3.1	
	CD				10.3		8.2		8.3		4		5.4		3.5		5.8		3.6		2.6		3.8	
24h	MD			14.3	9.6		8.4		7.9		5.3		6.5		4.5		6.9		4.5		3.7		4.2	
	CD			16.7	14.3		12.3		12.4		6		7.8		4.9		8		4.9		3.7		5.5	
Perpetual distortion	MD			7.9	5.3		4.5		4.5		2.6		3		2		3.3		2		1.7		2.3	
(After 24h)	CD			8.4	7.6		7.4		7.5		2.9		4		2.3		4.5		2.3		1.8		3	
60min	MD		19.61MPa (150℃,200kgf/㎠)	51.8	52.4		-		50.7		36.8		45.5		40.4		43		35		32.4		33.7	
	CD				-		-		-		-		-		-		-		36.1		35.6		38.7	
0.2% off set	CD	Mpa(kgf/㎠)		5.6	3.9(40)		4.0(41)		4.1(42)		5.3(54)		8.3(85)		7.8(80)		5.9(60)		9.4(96)					
The modulus of elasticity	CD	Gpa(10^3kgf/㎠)		0.34-0.62	2.14		1.85(18.9)		1.64(16.7)		1.91(19.5)		1.66(16.9)		1.35(13.8)		-		1.17(11.9)				1.22(12.4)	
0.2% off set	MD	Mpa(kgf/㎠)		7.6	11.4(116)		12.2(125)		12.8(131)		11.1(113)		12.7(129)		11.1(119)		10.0(102)		10.9(112)					
	CD			-	8.7(89)		8.7(89)		8.7(89)		9.7(99)		12.5(127)		12.0(122)		105.(107)		8.2(84)					
The modulus of elasticity	MD	Gpa(10^3kgf/㎠)		0.41	0.68(6.9)		0.75(7.6)		0.81(8.3)		0.66(6.7)		0.76(7.7)		0.76(7.7)		-		1.03(10.5)					
	CD			-	0.59(6.0)		0.64(6.5)		0.69(7.0)		0.63(6.4)		0.81(8.3)		0.78(8.0)		-		0.82(8.4)				0.78(8.0)	
Hardness				55	60		62		63		65		65		70		61	70	67		68		63	
IZOD Impact strength				154.9	144.1(14.7)		-		116.7(11.9)		120.0(12.2)		158.1(16.2)		104.9(10.7)		140.2(14.3)		-				135.3(13.8)	
Thermal conductivity				0.24(0.21)	0.37(0.32)		0.41(0.35)		0.45(0.39)		0.36(0.31)		0.33(0.28)		0.47(0.40)		0.45(0.39)		0.4.(0.37)		0.52(0.45)		0.46(0.4)	
Coefficient of linear expansion																								
25~90℃	MD			-	14.4		13.2		12.6		13.9		15		9.7		12.6		8.5		6.9		18.2	
	CD			12.2	5.3		6.4		7.5		4.7		6.3		7.8		7.9		7.2		6.3		7.4	
25~150℃	MD			-	15.1		14.2		13.2		13.9		15.8		10.3		13.5		9.4		8.1		20.1	
	CD			12.6	5.3		6.4		7.5		5.4		6.4		7.9		8.5		7.7		6.9		7.8	
25~200℃	MD			-	16.3		14.9		14.4		14.6		17.3		11.4		14.6		10.6		9.4		22.3	
	CD			13.7	6.2		7.1		8.5		5.8		6.9		9		9.2		8.5		7.6		8.8	
25~260℃	MD			-	18.5		17.5		16.8		16.6		20		14		17.6		13.5		12.1		26.4	
	CD			16.4	7.5		8.8		10		7		8		10.4		10.8		9.7		8.7		10.4	
Water absorption		%		0	0.015		0.014		0.013		0.016		0.01		0		0		-					
Limite PV value		Mpa m/sec																						
0.1 m/sec		(kgf/㎠ m/sec)		-	0.59(6)		0.69(7)		0.69(7)		0.79(8)		0.79(8)		0.59(6)		0.88(9)		0.98(10)		0.98(10)		0.88(3)	
0.5 m/sec				-	0.69(7)		0.88(9)		0.88(9)		1.37(14)		1.47(15)		0.98(10)		1.37(14)		1.37(14)		1.47(15)		1.47(15)	
5.0 m/sec				-	1.08(11)		1.18(12)		1.18(12)		1.77(18)		1.77(18)		0.59(6)		1.28(13)		1.76(18)		1.86(19)		1.77(18)	
Coefficient of abrasion (After 50h)		((m×sec)×10^-6)/ Mpa × m × h		713.8(7000)	0.51(5)		0.82(8)		0.71(7)		0.51(5)		0.61(6)		1.33(13)		9.98(9.6)		0.82(8)		1.33(13)		0.67(6)	
Dynamic coefficient of friction(water : after 50h)				-	550.6(5.4)		-		509.8(5)		-		-		-		46.9(460)		2.04(20)		2.55(25)		2.04(20)	
Dynamic coefficient of friction(After 50h)				-	0.39-0.42		0.38-0.42		0.50-0.54		0.29-0.30		0.29-0.31		0.12-0.17		0.22-0.25		0.31-0.37		0.31~0.35		0.27~0.30	
Static coefficient of friction				0.05-0.08	0.10-0.13		0.10-0.13		0.10-0.13		0.08-0.10		0.08-0.10		0.08-0.10		0.08-0.10		-		-			

LINED TANK/EP TANK
LINED PIPE & FITTING
LINED VALVE
AUTOMOBILE & PRECISION PART

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