



## 汽車市場 密封解決方案

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**Sealing Solutions for  
Automotive Industry**



# 關於繼茂

## About GMORS

### Certified GMORS

GMORS is a leading Taiwan supplier of rubber seals to Tier II and Tier III for light vehicle and heavy truck systems in automotive industry. Developing in automotive industry for 20 years, we provide sealing solutions to customers from Europe, Japan, North America, China, South Korea and Thailand. GMORS produces both non-safety and safety parts, according to IATF 16949:2016 process and customer's requested procedures. GMORS offers professional advice to customer's new vehicle design and market-led seal parts. We listen to all customers' demand, and design compatible rubber material, seal shape and prototype for trial run. We collect customer's test feedback and update our DFMEA (Design Failure Mode and Effects Analysis) for next improvement until customers feel satisfied.



38010-000

EMS 610117

OHS 610119

### GMORS 繼茂橡膠 經過認證的供應商

GMORS 是台灣領先的橡膠密封件供應商，向汽車工業的二級和三級供應商提供輕型車輛和重型卡車系統的橡膠密封件。我們在汽車行業發展已有 20 年，為來自歐洲、日本、北美、中國、韓國和泰國的客戶提供密封解決方案。GMORS 根據 IATF 16949:2016 的流程和客戶要求的程序，生產橡膠密封件。GMORS 聽取所有客戶的需求，設計相容的材料、密封形狀和樣品。我們收集客戶的測試反饋，並更新我們的 DFMEA（設計失效模式和效應分析），直到客戶感到滿意為止。

### 專業的實驗室

為了迅速滿足客戶的需求，GMORS 建立實驗室並配備了先進的測試設備和專業的工程師，負責設計、混練和測試橡膠配方。此外，GMORS 實驗室遵循嚴格的程序，已獲 TAF (ISO17025) 認證。根據 ASTM 的要求，每季或年度使用「TGA」、「FTIR」和「3 Sigma」標準量測來檢查每批膠料的混練品質。GMORS 擁有超過 100 種符合汽車規格的橡膠材料，也獲得了車廠客戶的認證。



### In-house Laboratory

To react promptly to customer's need for research and development, GMORS develops in-house laboratory and chemical engineers to design, mix and test rubber recipe. GMORS laboratory is equipped with advanced testing equipments and knowledgeable engineers. Moreover, GMORS laboratory follows rigorous procedures, which are certified by TAF (ISO17025). According to ASTM requirements, "TGA", "FTIR" and "3 Sigma" standard deviation measures are used to check the performance of mixing quality per batch for quarterly or annual revalidation. GMORS has more than 100 rubber materials that meet automotive specifications and are also certified by automotive customers.

### Mold Design

GMORS owns a mold shop with 3 axial and 5 axial CNC cutting machines to offer high-level seal surface finish. Highly precise cutting guarantees consistent dimension in each cavity. Also, the mistake proofing device can avoid mismatch and mold operation damage for long molding cycles.

### 模具設計

GMORS 的模具設計精良，除了可滿足產品外觀、尺寸與性能上的要求，對於量產性與生產良率的管制也具備領先同業的優勢，提供客戶最穩定的產品品質。



## Quality Assurance

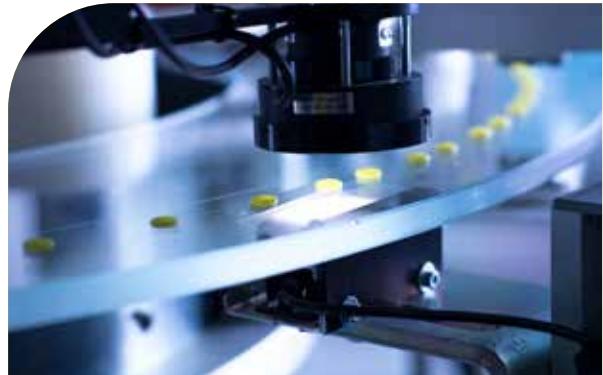
10% lower "gauge R&R" (Repeatability and Reproducibility) measuring equipments are used to make sure all dimension results are right. CPK $\geq$ 1.33 and PPK $\geq$ 1.67 are required and further prove GMORS capability and all records are utilized for constant improvement.

MES (Manufacturing execution system-barcode system), a control system for managing and monitoring work in process on a factory floor, provide reliable traceability.

## 品質保證

使用降低 10% 的 “gauge R&R” (重複性和再現性) 量設備來確保所有產品尺寸符合要求。要求 CPK $\geq$ 1.33 和 PPK $\geq$ 1.67，並利用所有記錄不斷改進。

GMORS 導入 MES (製造執行系統)，用於管理生產製程，提供可靠的追溯性。



## Cost Reduction

PPAP level III is our standard documents for automotive. Except control plan are divided into two sections: non-safety and safety parts. GMORS R&D engineers will design process for non-safety and safety issues according to the details of drawing, material specification and risk coefficient from technical review and analysis with customers.

For tracing and PPAP re-submission, PLM (Product Life-cycle Management) software system manages PFEMA, controls and records all "ECN" (Engineer Change Note) and "ECR" (Engineer Change Requirement) which need to be approved by right auditors. "Part Born" and "Process Born" in SAP system can calculate "Run at Rate" to guarantee 100% delivery performance. Via SAP finance system, we analyze actual cost for each process to figure out where the cost is wasting. "6 Sigma" and "TPM projects" can help reduce the defect rate, and therefore, cost reduction is supervised quarterly and annually.

## 成本控制

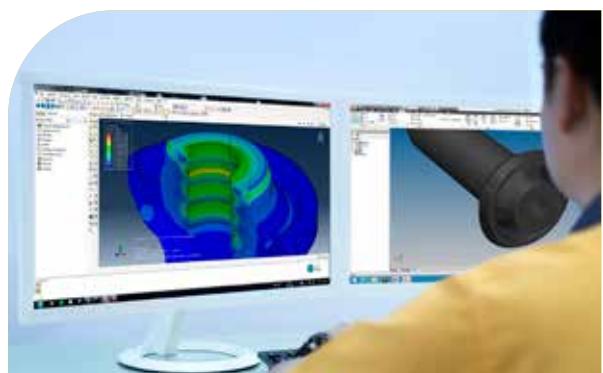
PPAP Level III is 汽車行業的標準文件。控制計劃被分為兩個部分：非安全關鍵和安全關鍵組件。GMORS 的研發工程師根據圖紙細節、材料規格、風險係數、技術審查和客戶的分析結果，設計相應的流程。

為了追蹤或重新提交 PPAP，PLM (產品生命周期管理) 系統管理 PFEMA( 製程失效模式效應分析 )，控制和記錄所有需要相關人員批准的 "ECN" ( 工程變更通知 ) 和 "ECR" ( 工程變更要求 )。在 SAP 系統中， "Part Born" 和 "Process Born" 可以計算 "Run at Rate"，以保證 100% 的交貨率。

通過 SAP 財務系統，我們分析各製程的實際成本，找出高成本的地方。"6 Sigma" 和 "TPM projects" 可以幫助降低不良率，從而更有效率的控制成本。

## 專業的開發團隊

為了滿足客戶對產品的要求，GMORS 工程團隊應用先進的設備和各種設計工具，例如：使用有限元分析 (FEA)，幫助每位客戶提供最佳的密封解決方案。



## Excellent Engineering team

To meet customer's requirements for the product, GMORS engineering team applies advanced equipment and a variety of design tools. The use of finite element analysis (FEA) helps GMORS to provide optimum sealing solutions for each customer's requests.

## 潔淨室等級和零組件的潔淨度

### Cleanroom Class & Cleanliness of Components

無塵室等級 - 100,000 級 清洗、品檢、包裝

Cleanroom Class - Class 100,000 Cleaning, Inspection, Package

#### 零組件潔淨度 Cleanliness of Components

特殊客戶要求 - 零組件潔淨度  
Customer Special Requirement - Cleanliness of components

CCC=A(D14/E12/F9/G6/H3/IJK00)

Code	Particle Size	Contamination Level	Number of particles per	
			More than	Up to (include)
D	25-50	14	8,000	16,000
E	50-100	12	2,000	4,000
F	100-150	9	250	500
G	150-200	6	32	64
H	200-400	3	4	8
I	400-600	00	0	0
J	600-1000	00	0	0
K	>1000	00	0	0

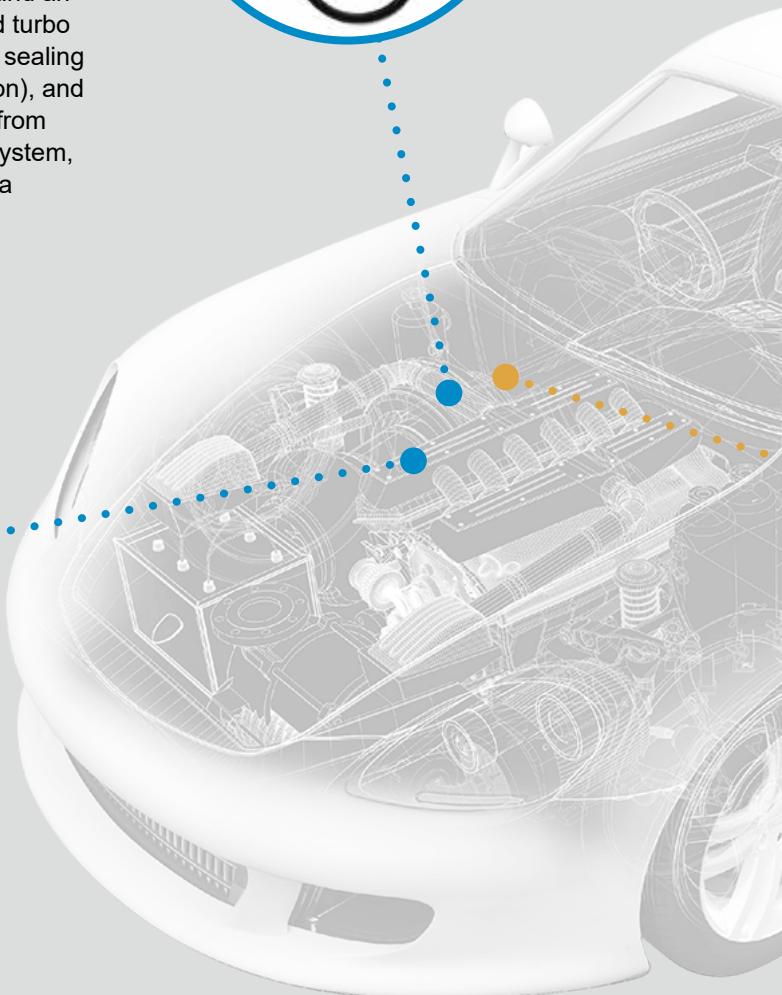


## 進氣和排氣系統

## Intake &amp; Exhaust System

進入低碳排放和永續發展的時代，對於 EGR 系統和渦輪中冷器等組件提出了更嚴苛的應用要求，因此您需要更優秀的密封解決方案。GMORS 還提供 SCR 系統（選擇性催化還原）的密封解決方案，以及柴油引擎的尾氣排放後處理系統，如 AdBlue®。對於 SCR 系統，GMORS 可因應客戶的需求提供客製化的橡膠材料，具備更加完善的密封可靠性，確保完整的密封效果。

Entering the era of low-carbon emission and sustainability imperative, you need better sealing solutions to withstand an even harsher environment such as in EGR system and turbo intercoolers. In addition to that, GMORS also provides sealing solutions for SCR system (Selective Catalytic Reduction), and for aftertreatment system of diesel exhaust emissions from diesel engines such as AdBlue®. Especially for SCR system, GMORS provide seals in custom compounds with extra reliability to fulfill the complete sealing purpose.



進氣和排氣系統 Intake and Exhaust System	Material	Compound
進氣歧管 Intake Manifold	Silicone	S5012AP
廢氣循環系統 EGR System (Exhaust Gas Recirculation)	FKM <sup>1)</sup> HNBR	V5731AA、V7014AA H6029AA
排氣歧管 Exhaust Manifold (Blow-By gas / AdBlue®)	HNBR EPDM	H7019AK E7002AA
氧氣感測器 O <sub>2</sub> Sensor	FKM	V8040AA

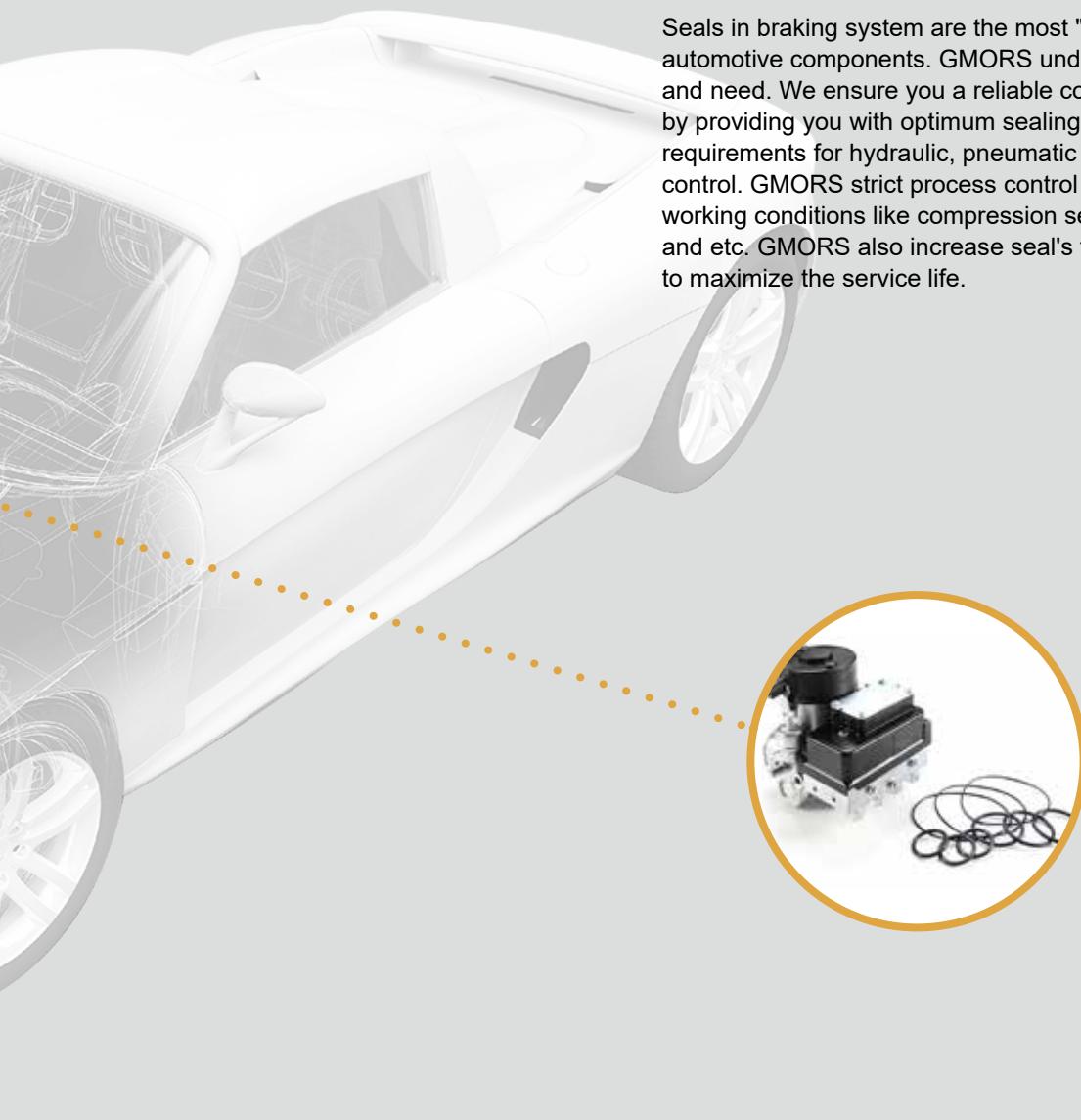
1) GMORS 的材質已得到車廠客戶認可  
GMORS compound have been approved by automotive customers.

## 剎車系統

### Braking System

剎車系統中的密封件是車輛最關鍵的零件之一。GMORS 理解您的需求，為確保剎車功能的可靠性，我們致力於提供最佳的密封解決方案。GMORS 的產品能夠滿足液壓、氣動回路和系統控制的各種需求。透過嚴格的製程控管，確保密封件在壓縮永久變形、應力、應變、蠕變等各種作用下均能表現卓越。GMORS 提高了密封件的耐摩擦和耐磨耗，以延長其使用壽命。

Seals in braking system are the most "system critical" automotive components. GMORS understands your concern and need. We ensure you a reliable control of braking function by providing you with optimum sealing solutions. We can meet requirements for hydraulic, pneumatic circuits, and system control. GMORS strict process control is to assure seals of working conditions like compression set, stress, strain, creep and etc. GMORS also increase seal's friction and wear in order to maximize the service life.



剎車系統 Braking System	材質 Material	材質配方 Compound
引擎潤滑 Fluid Brake DOT#3,4,5	EPDM 1)	E7905AA、E7005AA、E8005AA
剎車系統 Braking System	EPDM	E6935AA、E8105AA、E8005AA

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GMORS compound have been approved by automotive customers.

進氣和排氣系統  
Intake and  
Exhaust System

剎車系統  
Braking System

燃油系統  
Fuel System

冷卻和空調系統  
Cooling and Air  
Conditioning System

傳動和轉向系統  
Transmission and  
Steering System

感測器  
Sensor

半導和鐵路車輛制動系統  
Truck and Railway  
Air Brake System

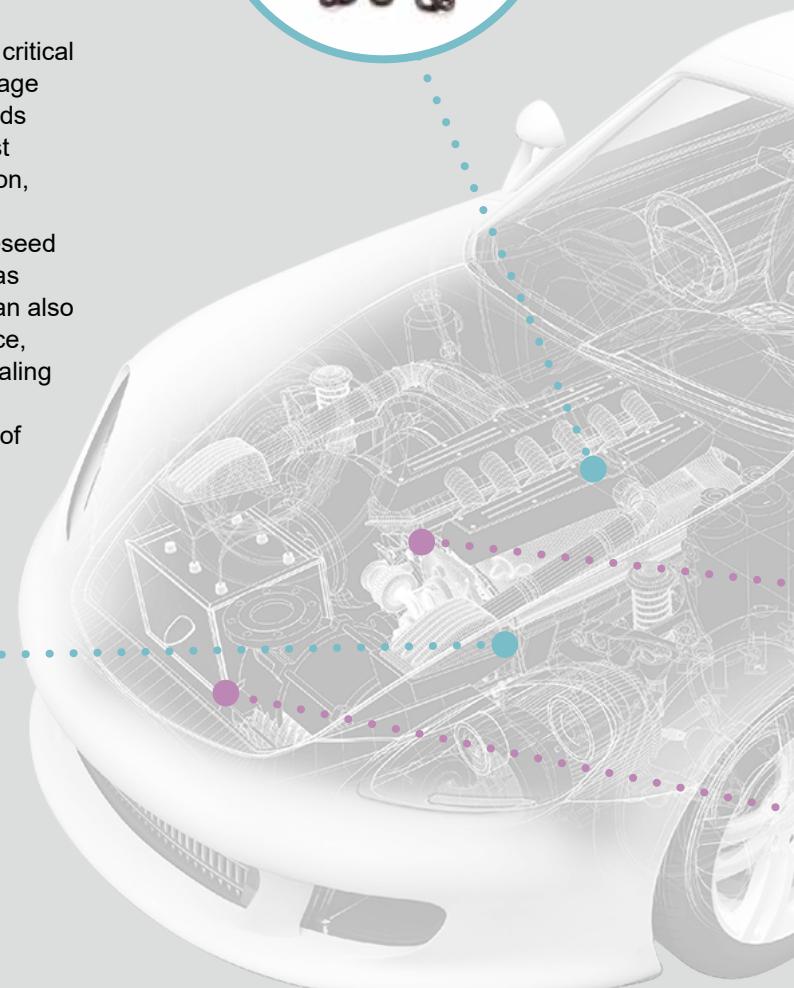
新能源車系統  
Electric Vehicle  
System

## 燃油系統

### Fuel System

在燃油系統中的密封應用被認為是具有挑戰性的安全關鍵部件。因此，GMORS 能在開發的早期階段根據各種密封應用設計相應材料，並在嚴苛的環境下進行測試，例如：體積膨脹、耐腐蝕性和各種溶劑浸泡測試。GMORS 的密封解決方案適用於生質柴油、菜籽甲酯（RME）、彈性燃料、壓縮天然氣（CNG）、液化石油氣（LPG）等。我們也可以滿足您對替代燃料的需求。例如：在高壓柴油系統中，GMORS 提供低滲透性和高密封可靠性的密封解決方案（如噴油嘴），以確保引擎在嚴苛的環境中能夠成功作動。

Seal application in fuel system is regarded as safety critical with challenging requirements. Therefore, in early stage of development, GMORS is able to design compounds according to kinds of sealing considerations, and test under harsh environments, such as volume expansion, erosion-resistance, and different additives. GMORS sealing solutions apply to a variety of biodiesel, rapeseed methyl ester (RME), flex fuel, compressed natural gas (CNG), liquid petroleum gas (LPG) and so on. We can also meet your need for new fuel alternatives. For instance, in high-pressure diesel systems, GMORS ensure sealing solution of the low permeability and the high sealing reliability (such as injector) for a successful function of engine even in challenging working environments.



燃油的種類 Type of gasoline	材質 Material 4)	材質配方 Compound
無鉛汽油 Unleaded Fuel	FKM 1) 2)	V6015AA、V7000AA、V7015AA
柴油 Diesel	FKM 1) 2)	V6015AA、V7000AA、V7015AA
生質柴油 Biodiesel	FKM	V7000AA、V7817AA
生物燃料 Biofuel	FKM 1) 2)	V7000AA
液化石油 LPG (Liquid Petroleum Gas)	Fluorosilicone 1) 3) NBR 5) 6)	F7004AO N7060AA、N7017AA

- 1) GMORS 的材質已得到車廠客戶認可  
GMORS compounds have been approved by automotive customers.
- 2) GMORS 提供標準 (-20° C~200° C) 和低溫材料 (-40° C~200° C)  
GMORS has general compound (-20° C~200° C) and low temperature compound (-40° C~200° C).
- 3) 氟矽橡膠的使用溫度為 -70° C ~ 200° C  
Fluorosilicone service temperature is -70° C~200° C.
- 4) 可提供表面塗層以減少安裝時的摩擦  
Surface coating is available to reduce assembly friction.
- 5) 通過 UL157 認證  
UL157 certification.
- 6) 通過 EN549 認證  
EN549 certification.



## 冷卻與空調系統

### Cooling and Air Conditioning System

當引擎的水溫升高時，耗油率下降，密封件必須能夠承受更高溫度的環境。GMORS 提供高性能材料，具有良好的壓縮回復和應力鬆弛，適用於最新的冷媒且符合環境法規，同時也可用於冷凝器、製冷揮發器、壓縮機、各種閥門和感測器等應用。GMORS 提供完美的密封解決方案，具備低滲透性、化學耐受性和體積膨脹控制等應用條件。根據您所使用的冷媒，GMORS 的密封解決方案可以防止和控制回路中的冷媒外洩流失。

When water temperature of the engine is increased to a greater mobility of the fuel oil, leading to better fuel economy, the seal has to be able to withstand a higher temperature cooling environment. GMORS high-performance materials with good compression set and stress relaxation property. Excellent property materials meet the latest regulations on refrigerants and the environments, and suit applications of condenser, evaporator, compressor, various valves, and sensors. GMORS offers perfect sealing solutions to stand the conditions such as permeability, chemical resistance, and control of volume expansion. And according to your system's refrigerant, GMORS sealing solutions can help prevent and control the refrigerant loss from the circuit.

進氣和排氣系統  
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Exhaust System

剎車系統  
Braking System

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冷卻和空調系統  
Cooling and Air  
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傳動和轉向系統  
Transmission and  
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感測器  
Sensor

半導和鐵路車輛密封系統  
Truck and Railway  
Air Brake System

新能源車系統  
Electric Vehicle  
System

冷卻系統 Cooling System	材質 Material	材質配方 Compound	空調系統介質 Air Conditioning System Medium	材質 Material	材質配方 Compound
散熱器 Radiator	EPDM	E6502AA、E5002AA	Freon R-134a 2), HFO-1234yf	HNBR	H7013AA、H7000AA、H6915AA
恆溫器 Thermostat	HNBR	H6509AR	Freon R-134a 2), PAG(lubricant)	EPDM 1)	E7579AH、E6935AA
			R744(CO2)	HNBR EPDM	H7013AA E7679AH
			Freon R-12, R-22	Neoprene/ CR	C7100AA

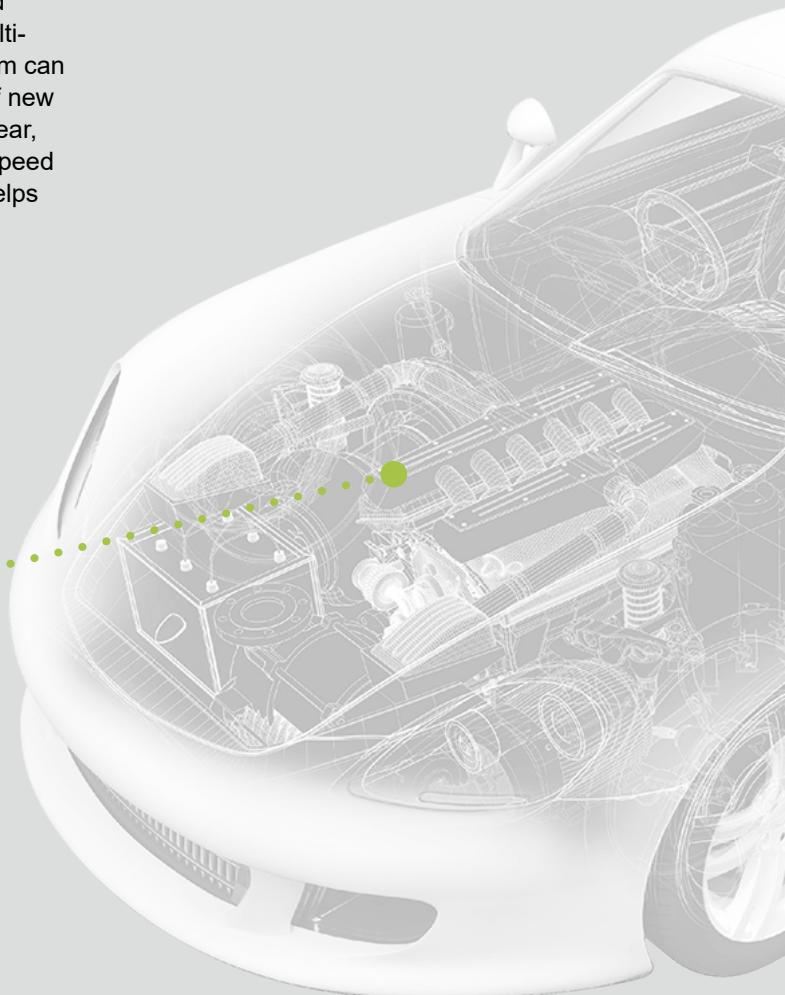
1) 材質已被 VOLKSWAGEN TL 524 32. 認證  
Rubber materials have been approved by VOLKSWAGEN TL 524 32.  
2) Freon R-134a 和含有 PAG 或 POE 的潤滑劑  
Freon R-134a and synthetic lubricant with PAG or POE.

## 傳動和轉向系統

### Transmission and Steering System

變速器和轉向系統通常面臨提升系統性能的挑戰，例如：通過減小尺寸、整合應用結構來提高效率。因此，需要具有多功能特性的密封件來支援。GMORS 的開發團隊可以滿足您對新系統設計和開發的需求，在高壓和高速作動的環境下，使密封件具備降噪、低摩擦、低磨耗和長壽命的特性。

Designers of transmission and steering system are usually challenged to improve the system performance, such as by reducing size, integrating application structure and enhancing system efficiency. Therefore, seal with multi-function feature is required. GMORS engineering team can meet your request for the design and development of new series, providing seals with low noise, low friction / wear, and long service life. Under high pressure and high speed working environments, a total sealing solution also helps to eliminate noise vibration.



變速箱油 Transmission Fluid Resistance		材質 Material	材質配方 Compound	轉向系統 Steering System		材質 Material	材質配方 Compound
DEXRON III	DEXRON VI			駕駛桿 Columns	HNBR 1)	H7518AA	
V		FKM	V7500AA、V7500AB、V7531AA	轉向軸 Half Shaft	HNBR 1) NBR 1)	H7026AA N8369AA	
V	V		V7544AA	軟管 Hose	HNBR 1)	H8024AA	
V	V	VAMAC	G7506AA、G7105AA、G7513AA	齒輪 Int Gear	HNBR 1) NBR 1)	H7315AA N8369AA	
V	V	ACM	P7000AA	泵浦 Pump	HNBR 1)	H8000AA	
				轉向齒輪 RP Gear	HNBR 1)	H9024AA	

1) GMORS 的材質已得到車廠客戶認可  
Rubber materials have been approved by automotive customers.



## 感測器

### Sensors

感測器是一種檢測設備，將操作環境的信息轉換為信號並輸出到電腦內，使溫度、壓力、氣流、車速等條件能夠被監測。感測器是依照應用環境條件設計的，這些條件包括溫度、防水和防震、油氣（汽油或柴油）、耐尿素 (AdBlue®)、耐冷卻液等等。

GMORS 有能力提供不同的材料配方，以滿足感測器的密封要求。

A sensor is a detection device that converts information of the operating environment into an electrical signal and outputs it to a computer, enabling conditions such as temperature, pressure, airflow, vehicle speed and so on to be monitored. Sensor providing the inanimate objects to looks like a human, has senses of touch, taste, and smell. Sensors are designed based on working condition requirements, which may include temperature, waterproof and shockproof requirements, oil and gas (gasoline or diesel), urea-resistant AdBlue, coolantresistance and so on.

GMORS has the ability to provide different rubber formulations to meet the sealing requirements of manufacturers of sensors.



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Truck and Railway  
Air Brake System

新能源車系統  
Electric Vehicle  
System

感測器 Sensor	材質 Material	材質配方 Compound
引擎 Engine 排氣後處理 Exhaust After-treatment 變速箱 Transmission 輪胎壓力監測 Tire Pressure Monitoring 空調系統 Air Conditioning 電子穩定系統 Electronic Stability	EPDM	E4000AA、E6935AA
	Fluorosilicone	F6004BU
	HNBR	H6915AA、H7036AA、H7500AA、H7500AB
	NBR	N4006AA、N5071AA、N7000AA、N7000AP、N7027AA、N7034AA、N7577AA、N9026AA、N7000AA
	Silicone	S5006BU、S7000AA、S7000AB、S7000AD、S7000AF、S7000AN、S7000AU、S7017AB
	FKM	V6017AA、V7000AE、V7000AG、V7000AR、V7082AA、V7500AA、V7500AB、V7500AC、V7500AG、V7544AA、V7582AC、V8040AA、V8081AA、V8184AA、V9082AB

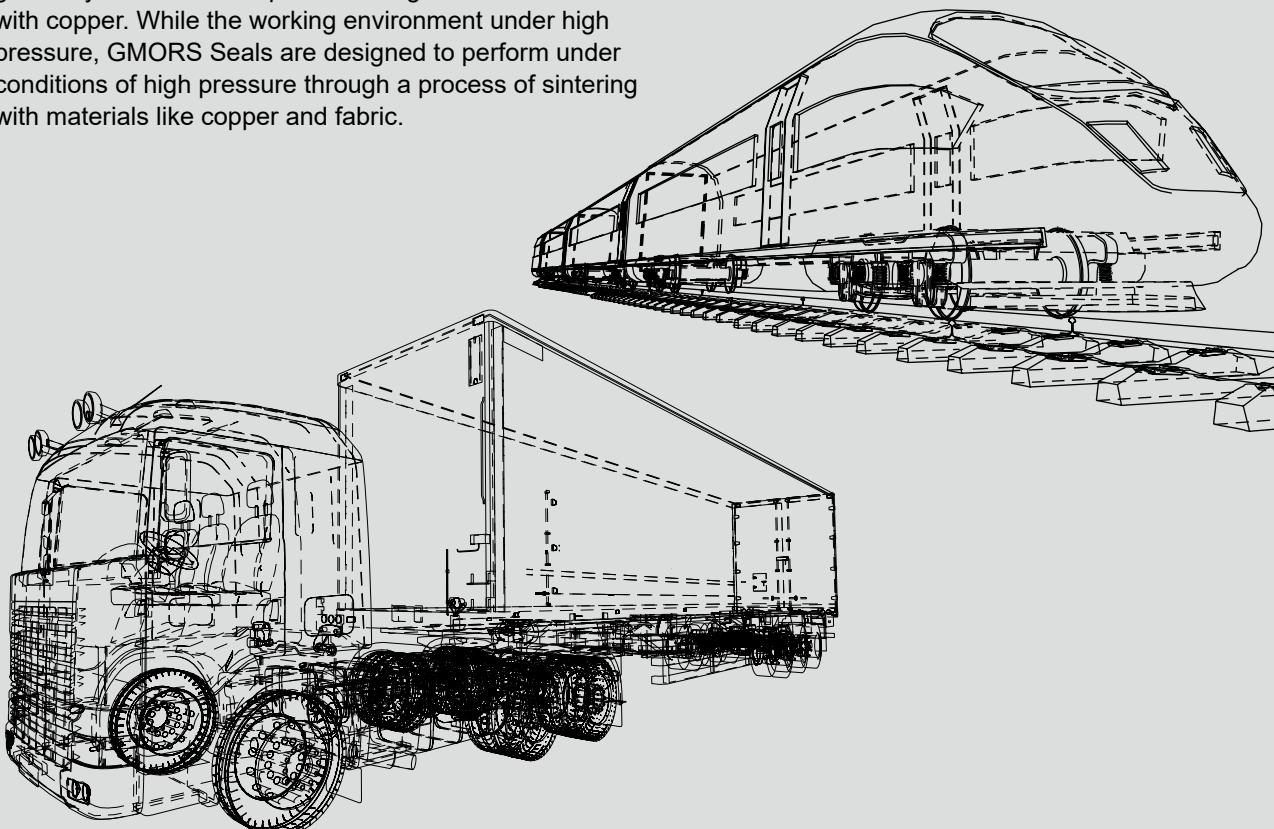
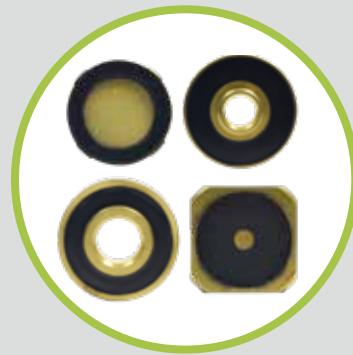
## 卡車和鐵路車輛空剎系統

### Trucks and Railway Air Brake System

空氣剎車系統的組件包括空氣儲罐、安全閥、低壓指示燈、壓縮機、壓力調節器和排氣閥、制動閥、中繼閥、快速排氣閥和制動氣缸。

空氣剎車系統利用高壓的進氣和排氣來為卡車和鐵路車輛進行剎車。通常使用的橡膠材料是 NBR。一般產品設計是橡膠燒結銅件。為因應高壓的工作環境，GMORS 使用橡膠、布料和銅件進行燒結做為密封件的設計。

The components of an air brake system consists of an air storage tank, safety valve, low pressure indicator, a compressor, pressure governer and release valve, brake valve, relay valve, quick release valve and brake chamber. The air brake system makes use of air intake and exhaust at high pressure to generate braking efficiency for trucks and trains. The rubber material that is used is generally NBR. General product design is rubber sintered with copper. While the working environment under high pressure, GMORS Seals are designed to perform under conditions of high pressure through a process of sintering with materials like copper and fabric.



空剎系統 Air Brake Systems	材質 Material	材質配方 Compound
	NBR	N8088AA

## 新能源車系統

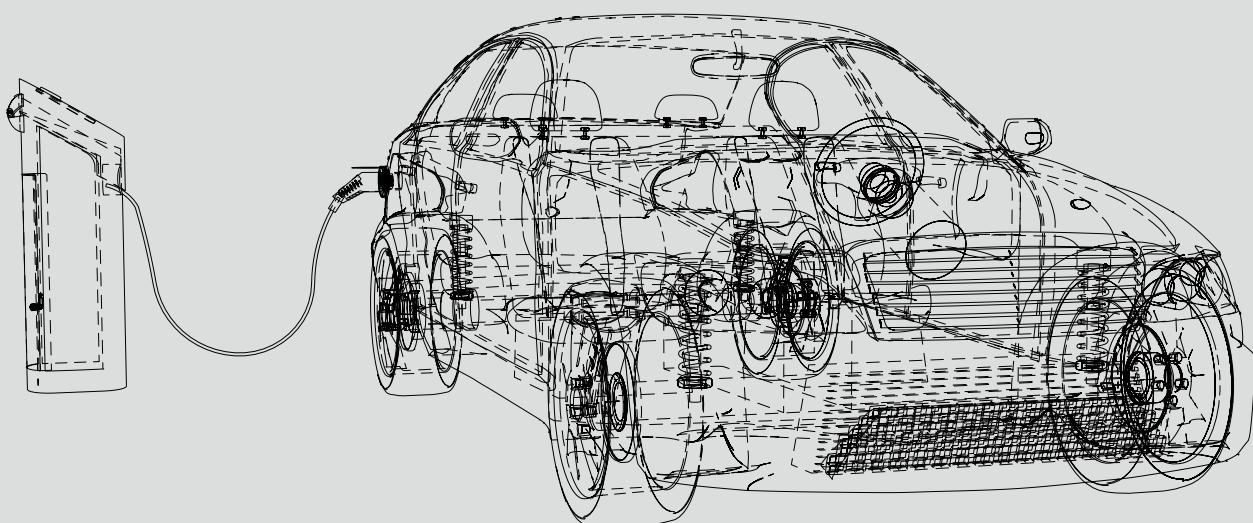
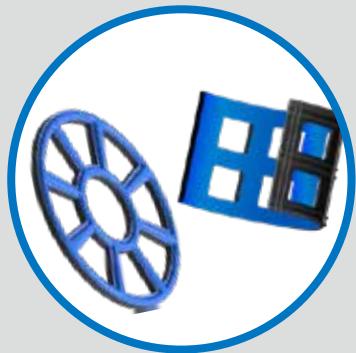
### Electric Vehicle System

汽車行業正在邁向一個重要的轉折點。隨著新技術的創新，汽車零部件日益多元化。與傳統燃油驅動的車輛相比，新能源車的關鍵零部件在於電池和熱管理系統（BTMS）。

電動車和混合動力車輛的電池具有更高的電流和能量容量，必須比一般的電池更堅固且品質更高。電動車的電池在更嚴苛的溫度和壓力條件下運作，同時還必須防止環境中的灰塵和濕氣滲入。

GMORS 有助於在這種嚴苛的條件下延長電池的使用壽命。

A sensor is a detection device that converts information of the operating environment into an electrical signal and outputs it to a computer, enabling conditions such as temperature, pressure, airflow, vehicle speed and so on to be monitored. Sensor providing the inanimate objects to looks like a human, has senses of touch, taste, and smell. Sensors are designed based on working condition requirements, which may include temperature, waterproof and shockproof requirements, oil and gas (gasoline or diesel), urea-resistant AdBlue, coolantresistance and so on. GMORS has the ability to provide different rubber formulations to meet the sealing requirements of manufacturers of sensors.



電動車系統組件 Electric Vehicle System Components	材質 Material	材質配方 Compound
電池模組 Battery pack application	Silicone 1)	N8088AA
熱管理系統 Thermal management system	Silicone EPDM	S5556AA E4031AA、E5010AA、E6935AA、E6031AA
冷卻管路 Cooling system	EPDM	E7070AI、E6002AA
空調管路接 Air conditioner fittings	EPDM	E7170AA01
感溫器 Temperature Sensor	Silicone	S4012AB
懸吊系統 Car suspension	EPDM	E8331AA

1) 符合 UL94 阻燃等級 V-0  
UL 94 flame ratings, V-0

進氣和排氣系統  
Intake and  
Exhaust System

剎車系統  
Braking System

燃油系統  
Fuel System

冷卻和空調系統  
Cooling and Air  
Conditioning System

傳動和轉向系統  
Transmission and  
Steering System

感測器  
Sensor

半軍和鐵路車輛密封系統  
Truck and Railway  
Air Brake System

新能源車系統  
Electric Vehicle  
System

# MEMO

## O環大師 O-Ring Master

GMORS O環大師提供橡膠密封圈的國際標準尺寸查詢，當您使用本應用程式(APP)您不需要網路連線即可操作；除了O型環也可以查詢到X型環及背托環(補強環)尺寸，另外也可以依安裝的缸體溝槽尺寸搜尋您適用的O型環。

GMORS O-Ring Master is the completed tool for standard rubber seal sizes. When you use this APP, you don't need to have internet. In addition to O-Ring sizes, it also includes the search functions of X-Ring and Back-Up Ring. You can also use O-Ring Housing to choose suitable O-Ring in your application.



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## 材質大師 Material Master

GMORS 材質大師依照您橡膠密封圈產品的應用環境，像是「溫度」與「介質」來建議適用的材質。我們提供近千筆介質來比對材質的兼容性。另外提供GMORS多項符合國際認証的橡膠材質，像是NSF61, WRAS, ACS, KTW, W-270, DIN EN 549, UL 157, API 6A, NORSO M-710, TOTAL EP PVV 142 and NACE TM0297,歡迎來信諮詢選購。

GMORS Material Master give you the materials recommendation for your O-Ring application, based on the working temperature and medium of working environment. We provide thousand kinds of environment condition for compatibility evaluation. In addition, GMORS provide certified rubber compounds for various international standards, such as NSF61, WRAS, ACS, KTW, W-270, DIN EN 549, UL 157, API 6A, NORSO M-710, TOTAL EP PVV 142 and NACE TM0297. Please email us for further information.



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