

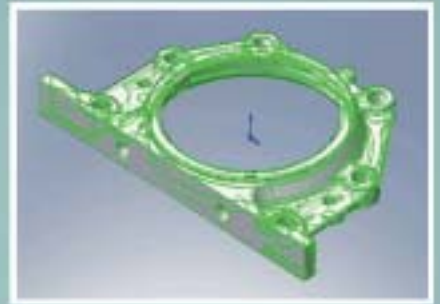


MAO SHUN
ENTERPRISE GROUP

NAK

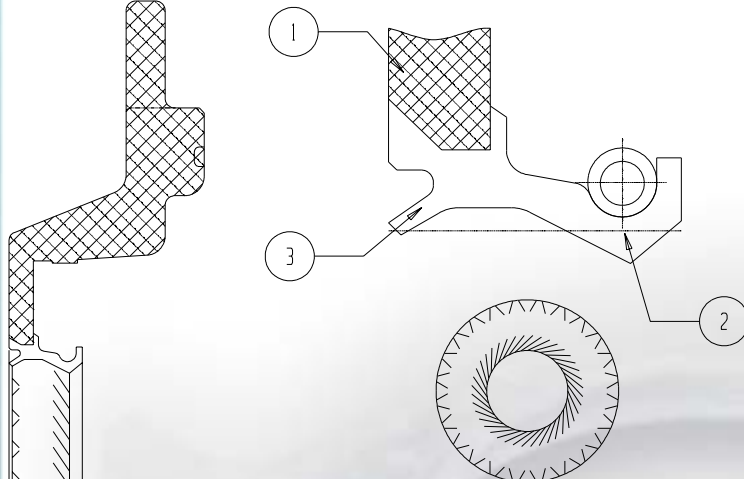
NAK Sealing Technologies Corporation

Crank Shaft Seal



2007/02

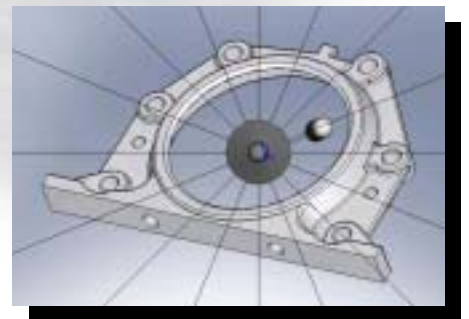
Product Information

	1	鋁合金鑄造件 Aluminum die casting
	2	密封唇 Sealing lip
	3	防塵唇 Dust lip

特色-Features

後曲柄軸油封主要由旋轉密封件、鋁合金鑄造件所組成，其本身具有可導正快速定位之插銷孔，配合導正銷可精確裝置於引擎機構上。另唇部本身具有迴油溝之設計，可減少密封流體的洩漏、延長油封使用壽命、降低摩擦及增加潤滑...等等。

The rear crankshaft seal is made up of rotary seal, aluminum die cast retainer and two dowel pins to accurately position the retainer to the engine block. The helix structure on main lip can pump the oil from air-side to oil-side that will reduce fluid leakage, extend seal life, reduce friction and increase lubrication etc.



Product Information

材質-Material

橡膠：FKM 硬度80 Shore A

鐵殼：鋁合金

彈簧：SAE 1070 鋼材

Rubber：FKM 80 Shore A

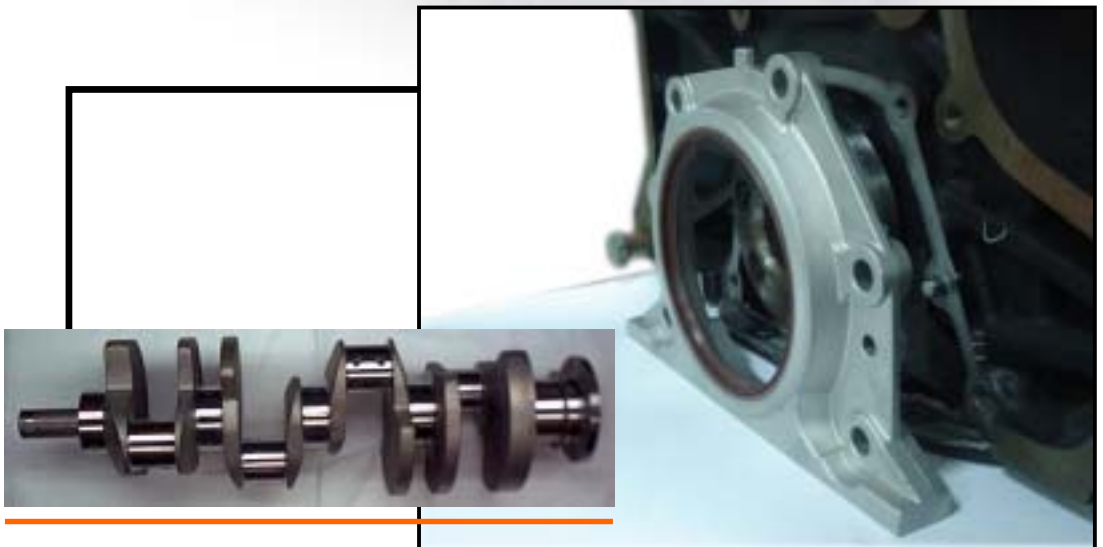
Case：Aluminum Alloy

Spring：SAE 1070

應用環境-Application

後曲柄軸油封應用於汽車產業，主要用於密封引擎曲柄軸。

The rear crankshaft seal is applied in the automotive field. It is used for sealing crankshaft at the internal combustion engine.



一體成形後曲柄軸油封的特點

THE ADVANTAGES OF REAR CRANKSHAFT SEAL

簡化密封模組裝配件數- (Simplified modular assembly)

以往鑄造件曲柄軸油封，需由動態密封件裝配於鐵殼鑄造件而組成，此產品將二者合而為一，可簡化組裝件數，減少花費於油封組裝的時間。

The conventional rear crankshaft seals are made up of a dynamic seal, an aluminum die cast retainer. This product combines two elements into one. It can reduce assembled parts.



節省成本- (Cost reduction)

減少油封之零件數可將產品製程簡化，節省各製程所需人力、物料成本，進而降低產品總成本花費。

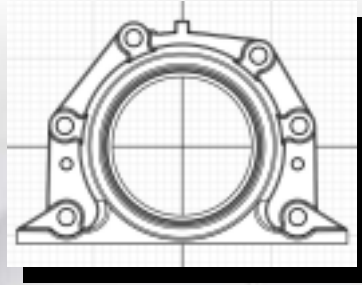
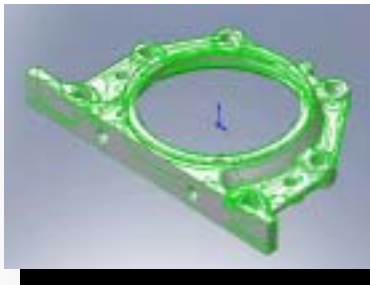
Sealing module can simplify manufacturing process of product, save cost of each process, further decrease the total cost of product.



消除零組件相互裝配面之間潛在的洩漏疑慮— (Eliminating potential leak paths)

各零組件相互裝配面間皆有靜態洩漏之可能性，本產品能減少零件裝配面，進而降低潛在的靜態失效疑慮。

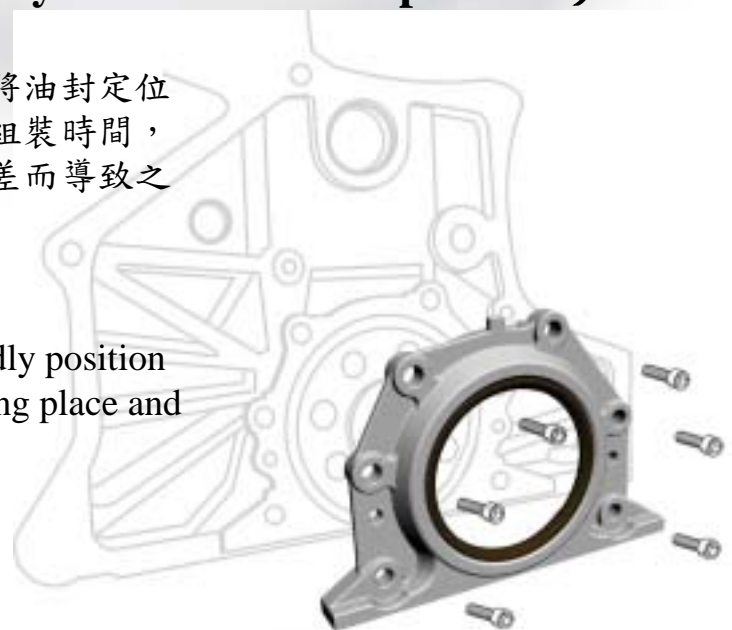
The matching surface of each element may have potential leak. The simplified modular assembly decreases questions of static sealing failure.



快速定位安裝— (Rapidly installation and position)

插銷導孔的設計，可快速將油封定位至正確裝配位置，減少油封組裝時間，更可降低因油封裝配位置誤差而導致之靜態或動態失效之風險。

The dowel pin design can rapidly position the seal into the right assembling place and reduce the errors of assembly.



唇部迴油溝設計- (Hydrodynamic aid design on main lip)

唇部迴油溝的設計可以減少密封流體洩漏、延長油封使用壽命、減少摩擦力並且增加潤滑性...等等。

The helix structure on main lip can pump the oil from air-side to oil-side that will reduce fluid leakage, extend seal life, reduce friction and increase lubrication etc.

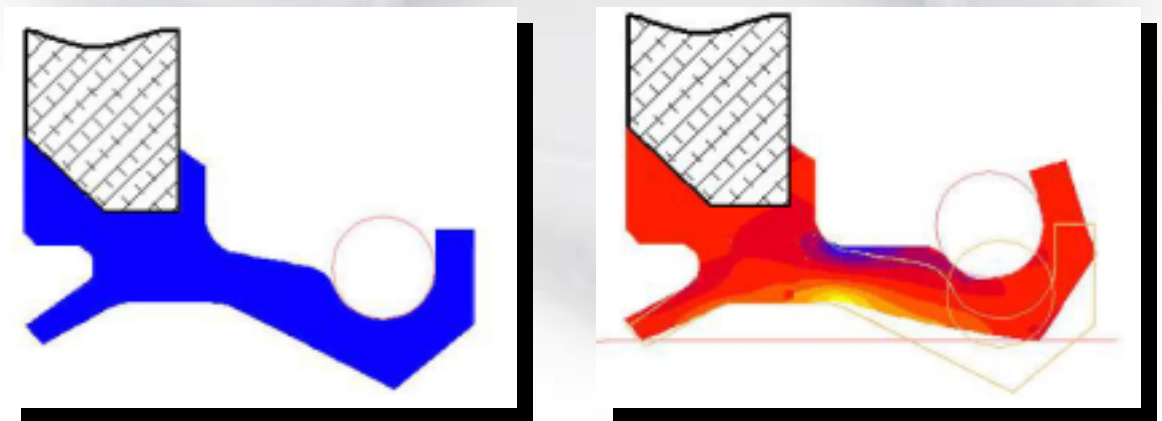


有限元素分析，是利用運用電腦模擬技術從事工程分析。

Finite element analysis (FEA), computer simulation technique, which is used in engineering analysis.

有限元素法一連串的電腦數值運算程序，包含彈簧力及橡膠材質特性的套用，獲得油封密封唇部在安裝於引擎曲柄軸後的唇部變形、應力及應變的狀況。

The FEM conducts a series of computational procedures involving applied spring forces, and the properties of the rubber to get the sealing lip deformation, strains and stresses which are caused by installed on the engine crankshaft.



在開發設計油封初期階段使用有限元素分析軟體是強大且有效率的，並了解及確認油封密封性能。

The FEA software is powerful and efficiency to used at the beginning design stage to realize and verify the seal sealing function.