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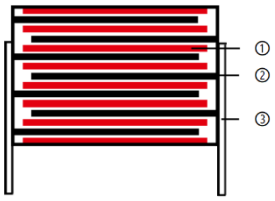
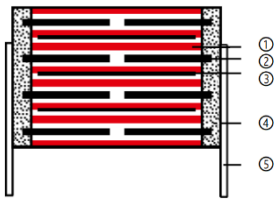
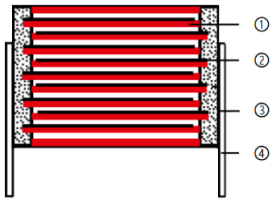
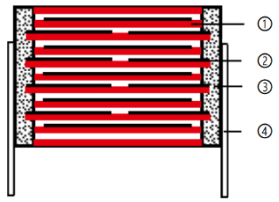
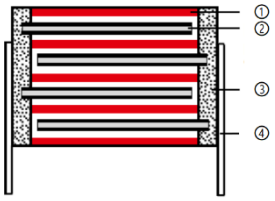
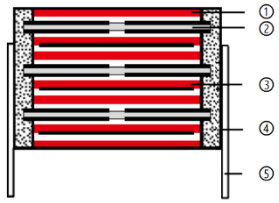
薄膜和箔結構 Film and Foil Construction		**內**部串聯和自愈性金**屬**化塑料薄膜和箔**結**构 Film and Foil Construction with Internal Series Connection and Self-Healing, Metallized Plastic Film		
				
① 電介質	② 金屬箔電極	① 電介質	② 金屬箔電極	
③ 引線		③ 真空沉積電極	④ 金屬接觸層	⑤ 引線
金屬化結構 Metallized Connection		**內**部串聯金屬化結構 Metallized Construction with Internal Series Connection		
				
① 電介質	② 真空沉積電極	① 電介質	② 真空沉積電極	
③ 金屬接觸層	④ 引線	③ 金屬接觸層	④ 引線	
雙面金屬化自愈性塑料膜的脈沖負載結構 Pulse Duty Construction with Self-Healing Plastic Film Metallized on Both Sides		**內**部串聯雙面金屬化自愈性塑料膜的脈沖負載結構 Pulse Duty Construction with Internal Series Connection and Self-Healing Plastic Film Metallized on Both Sides		
				
① 電介質	② 雙面金屬化電極載體	① 電介質	② 雙面金屬化電極載體	
③ 金屬接觸層	④ 引線	③ 單面金屬化膜	④ 金屬接觸層	⑤ 引線

薄膜和箔結構的優點：	Advantages of Film/Foil Construction:	金屬化結構的優點：	Advantages of Metallized Construction:
■ 高脈衝和電流額定值	■ High pulse and current rating	■ 高容量小型盒裝	■ High capacitances in small box sizes
■ 絕緣電阻高	■ High insulation resistance	■ 出色的自愈力	■ Excellent self-healing ability
■ 誤差接近 ±1%	■ Close tolerances up to ± 1%	■ 性價比優異	■ Very good price/performance ratio
缺點：失效模式為短路	Disadvantages: Failure mode short circuit	缺點：低脈衝抵抗	Disadvantage: low pulse resistance

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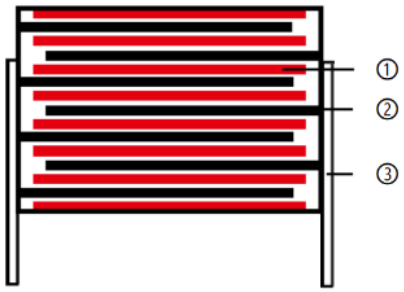
薄膜和箔結構 Film and Foil Construction



① 電介質 Dielectric	② 金屬箔電極 Metal foil electrode	③ 引線 Leads

薄膜和箔結構 主要設計於容值較小的電容器（100pF~0.1μF），這種結構的優點是金屬鋁箔電極接觸良好，脈衝强度高。
箔式电容器的介電膜擊穿會導致不可逆的短路，從而導致故障。為了避免電介質中的薄弱點引起的擊穿，
所選擇的絶緣膜總是比擊穿强度理論值上所要求的厚度要厚，小於 4μm 的薄膜不用於箔式電容器，因為其薄弱點比例較高。
使用較厚的絶緣膜必然對尺寸和材料產生不利影響，較厚的絶緣膜為了實現特定容量，薄膜膠帶的長度也必須等量的增加。
因此，絶緣膜越厚，捲繞元件的體積就越大。

優點：由於端接導線与金屬箔電極的良好接觸，脈沖負載能力高。

The film/foil construction is mainly used for capacitors with smaller capacitance (100pF through 0.1μF).
The advantage of this construction is the easy contactability of the metal foil electrodes and the good pulse strength.
A breakdown in the dielectric film of a F capacitor leads to an irreversible short circuit and thus, to failure.
To avoid breakdowns caused by weak spots in the dielectric, the insulating film chosen is always thicker than theoretically required by the values which are determined from the specific breakdown strength of the material.
Films of less than 4 μm are not used for F capacitors because of their high proportion of weak points.
The necessity for thicker insulating film has an unfavorable effect on the size and the material used. In order to achieve a particular capacitance with thicker insulating film, the length of the band also has to be increased by the same amount.
Thicker insulating film therefore squares the volume of the winding element.

Advantage：High pulse loading capacity due to good contact of the terminating wires to the metal foil electrodes.

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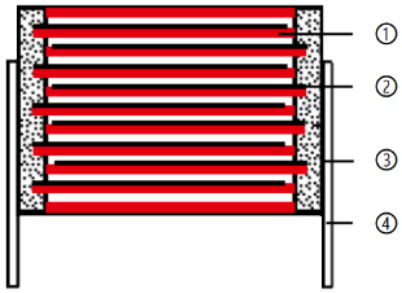
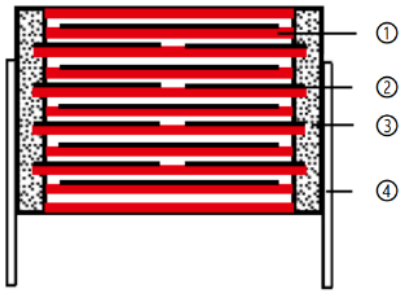
金屬化結構 Metallized Construction	內串金屬化結構 Metallized Construction (Internal Series)
	

① 電介質 Dielectric ② 真空沉積電極 Vacuum-deposited electrode ③ 金屬接觸層 Metal contact layer ④ 引線 Leads

金屬化結構 使得可以制造出更小尺寸的較大容值的捲繞型電容器（約 0.01μF 至 100μF 及以上），
對於金屬化電容器，絶緣膜上真空鍍鋁薄層（約 0.03μm）作為導電電極，在擊穿的情況下，短路電流會導致金屬涂層在故障點周圍蒸發，而不會降低電介質的質量，形成絶緣區域，電容器保持完好（自愈），由此導致的幾個 pF 的電容損失并不重要。
對於金屬化電容器，可以充分利用絶緣膜的擊穿强度，在電容器的生產過程中，薄弱環節會被破壞。
與金屬化電容器的小尺寸和自愈特性的優點相比，由於真空沈積的金屬層較薄，其電流負載能力有限。

優點：金屬化結構具有最有利的容量/體積值。

The metallized construction also makes it possible to produce wound capacitors with larger capacitance values in small sizes (~ 0.01μF through 100μF and larger).
In the case of M capacitors, thin layers of aluminium (~ 0.03μm) are vacuum-deposited on the insulating film as conducting electrodes. In the case of a breakdown, the short circuit current causes the thin metal coating to evaporate around the point of failure, without reducing the quality of the dielectric. An insulating area is formed, the capacitor remains intact (self-healing).
The capacitance loss of a few pF which this causes, is of no importance.
With metallized capacitors, the breakdown strength of the insulating film can be used to the full.
During the production of the capacitors the weak points are burnt out.
In contrast to the advantages of the small dimensions and the self-healing properties of metallized capacitors,
there is the disadvantage of a limited current loading capacity as a result of the thin, vacuum-deposited metal layers.

Advantage：Construction with the most favorable capacitance/volume value.

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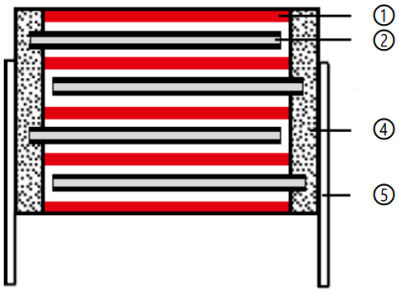
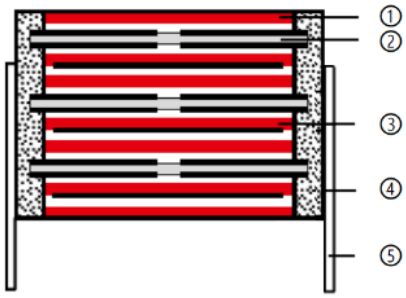
雙面金屬化結構 Double Sided Metallized Construction	內串雙面金屬化 Double Sided Metallized (Internal Series)
	

① 電介質 Dielectric ② 雙面金属化電極載體塑料膜 Electrode carrier plastic film metallized on both sides
③ 單面金屬化塑料膜 Plastic film metallized on one side ④ 金屬接觸層 Metal contact layer ⑤ 引線 Leads

雙面金屬化膜結構 克服了單面金屬化電容器電流負載能量有限的缺點，其中電極不直接在介質膜上金屬化，而鋁被真空沈積在塑料薄膜的兩面，並且該雙面金屬膜與絕緣膜一同被捲起，就像薄膜和箔電容器一樣。

通過噴附金屬並形成接觸，並與載體膜上的雙面金屬連接在一起作為導體。

因此，載體膜處於無場空間中，其介電性能不重要（無場空間中的薄膜），並且故障時的自愈過程發生在這該薄膜上。

由於雙面金屬化，這類型的電容器具有與單面金屬化電容器相同良好的自愈特性，具有雙層金屬化的導電能力和更好的接觸優勢。

這類電容器可以承受非常高的脈沖電流，並且只比單面金屬化電容器的體積稍大，在關鍵應用中具有很高的操作安全性。

優點：由於金屬層與噴金層的良好接觸，因此具有高脈沖負載能力，由於載體膜在於無場空間中具有良好的自愈特性。

In order to counter the disadvantage of the limited current loading capacity of single-sided metallized capacitors, in which the electrodes are not directly metallized on the dielectric film. Aluminium is vacuum-deposited on both sides of a thin plastic film and this film is rolled up along with the insulating film as is the case with a film/foil capacitor. With schoopage (metal flame spraying) and contacting, the two metal layers on the carrier film are joined together as a conductor.

The carrier film is therefore in field free space, its dielectric properties are of no importance, ("film in field free space") and the self-healing process in breakdowns takes place on this film. Thanks to the metallization on both sides, this type has the same good self-healing properties as a capacitor which is metallized on one side only, the conducting capacity of a double thickness metallized layer and the advantage of better contacts.

These capacitors can stand up to very high pulse currents and have only a slightly larger volume than single-sided metallized capacitors. They offer high operating safety in critical applications.

Advantage：High pulse loading capacity due to good contacting of the metal layers with schoopage.

Good self-healing properties thanks to the carrier film in field free space.

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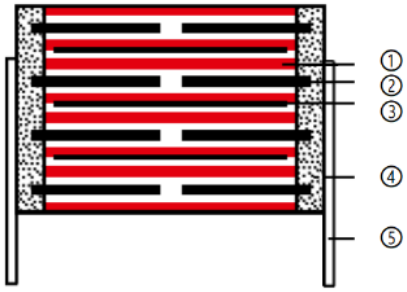
內串薄膜和箔結構和金屬化塑料薄膜 Film and Foil Construction with (Internal Series) and Metallized Plastic Film



① 電介質 Dielectric ② 雙面金属化電極載體塑料膜 Electrode carrier plastic film metallized on both sides
③ 單面金屬化塑料膜 Plastic film metallized on one side ④ 金屬接觸層 Metal contact layer ⑤ 引線 Leads

內部串聯金屬化膜的薄膜和箔結構 由於其具有金屬化電極載體的膜/箔結構，
這種電容器類型適用於較高電流負載，電容器為串聯結構，載流電極由兩個金屬箔和作為“浮動電極”的金屬化載體膜組成。
在噴金接合之後，導線與捲繞元件的所有邊緣連接，浮動電極僅通過電容耦合来承載電流。
這種構造，自愈的優點（通過金屬化浮動電極）同時與金屬箔特別安全的優點相結合，由於串聯連接，電暈起始的電壓值加倍。
以這種構造的電容器適用於運行安全性非常高的額定電流。

優點：由於良好的結合（金屬鋁箔電極和金屬化電極載體膜），具有較高的脈沖負載能力。
金屬化載體膜浮動電極具有良好的自愈特性。由於串聯，電暈起始的電壓值增加了一倍。

Due to its film/foil structure with metallized electrode carrier, this capacitor type is suitable for highest current loads. The capacitor is constructed as a series connection, the current carrying electrodes consist of two metal foils and a metallized carrier film as a "floating electrode".
After schoopage and bonding the wires are connected with all the edges of the winding element.
The floating electrode only carries current through capacitive coupling.
In this way, the advantage of self-healing (by means of the metallized floating electrode) is combined with the advantage of the exceptionally safe bonding of the metal foil.
Thanks to the series connection, the value of the corona inception voltage is doubled.
Capacitors constructed in this way are suitable for very high rated currents with a maximum of operating safety.

Advantage :
Highest pulse loading capacity due to very good bonding (metal foil electrode and metallized electrode carrier film).
Good self-healing properties thanks to the metallized carrier film floating electrode.
Due to the series connection, the value of the corona inception voltage is doubled.