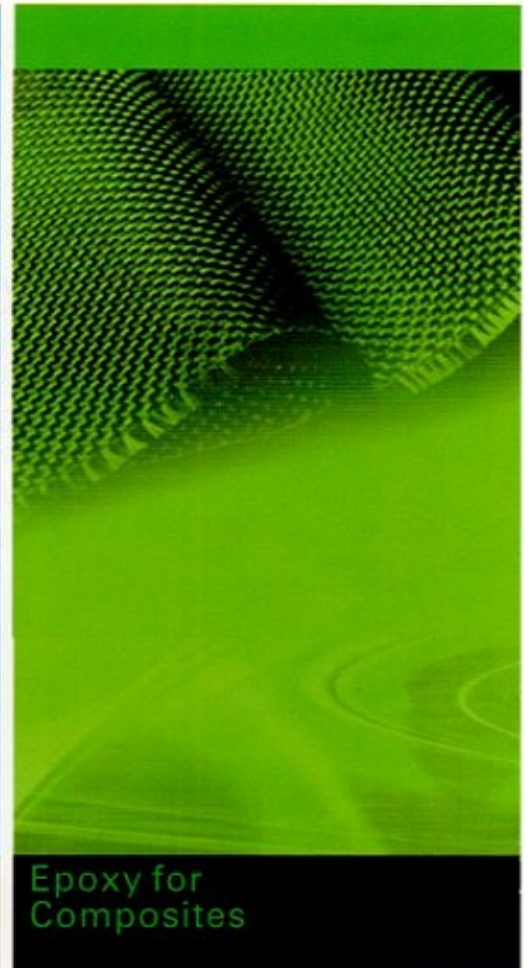




Pipeline  
Rehabilitation



- Active
- Smart
- Efficient
- Creative



Epoxy for  
Composites

# Composites

## 複合材料

# Epoxy for 複合材料用環氧樹脂 Composites

複合材料顧名思義是由兩種以上的材質所組合而成，藉由不同材質的特性，達到複合的效果。一般複合材料是由基材(matrix)及補強材(reinforcement)所構成。常用的補強材料有玻璃纖維、碳纖維與克維拉纖維等，依照纖維形式還可細分為短纖、連續長纖、編織纖維、及粉狀纖維等。而基材則有不飽和聚酯樹脂、酚醛樹脂、以及環氧樹脂等。其中以環氧樹脂最為廣泛的應用在運動器材、印刷電路板、工程補強、汽車飾板等產業。複合材料有許多加工方式，其中預浸布疊層法是將樹脂均勻的塗佈在單向或是雙向編織的纖維上，製成有黏性的預浸布，再依照設計裁剪貼合，然後固化成型。

Composites are designed materials made from two or more constituent materials with significantly different properties which remain separate and distinct on a macroscopic level within the finished structure. There are two categories of constituent materials: matrix and reinforcement. The most common reinforcement materials are glass fiber, carbon fiber and Kevlar fiber. The composites can be named according to the dimension of the fiber, such as short fiber-reinforced materials, continuous fiber-reinforced materials, woven fiber-reinforced materials and powdered fiber-reinforced materials. The matrix can be UP (unsaturated polyester), phenolic resin or epoxy resin. The epoxy system is widely used in sporting goods, PCB (printed circuit board), civil engineering and decoration panel for vehicles. The composites can be made from the prepreg, which is usually coated resin on the UD (uni-direction) or woven fibers. At room temperature (23~25°C), the prepreg has tacky, the laminate can be stuck according to the design, and then cure by heat.



## 預浸布用環氧樹脂

預浸布的製造可以分為熱融膠製程和溶劑型製程。前者使用不含溶劑的固體環氧樹脂，在70~75度融化後塗佈在纖維上；後者則是利用丁酮把環氧樹脂溶解，將纖維含浸後加熱讓溶劑揮發。

Prepreg can be manufactured from hotmelt or solvent type epoxy system. Hotmelt systems use solid epoxy formulation without any solvent, and melt the resin by heating to 70~75°C, then coating on the fiber. Solvent type systems use MEK (methyl ethyl ketone) to dissolve the resin, wet-out the fiber, then evaporate the residual solvent by heat.

### 熱融型環氧樹脂 / Hotmelt Type Epoxy

產品編號 Product No.	混合比例 Mix Ratio	顏色 Color	黏度 Viscosity	混合黏度 Mixing Viscosity	玻璃轉移溫度Tg	固含量 RC
NH 037	100 : 1.5 : 0.5	A : 無色 Colorless B : 白色 White C : 白色 White	A : 40,000 (70°C) B : 320,000 (25°C) C : 5,500 (25°C)	22,000 (70°C)	115°C	100%
NH 214	100 : 1.5 : 0.5	A : 無色 Colorless B : 白色 White C : 白色 White	A : 32,000 (70°C) B : 400,000 (25°C) C : 2,800 (25°C)	20,000 (70°C)	115°C	100%

### 溶劑型環氧樹脂 / Solvent Type Epoxy

NS 353	100 : 20	A : 黃褐 Brown B : 無 Colorless	A : 16,000 (25°C) B : 70 (25°C)	3,500 (25°C)	115°C	80%
NS 412	100 : 1.5	A : 黃 Yellow B : 白 White	A : 2,500 (25°C) B : 粉 Powder	2,500 (25°C)	120°C	80%

## 高Tg環氧樹脂

高Tg的複合材料可以應用在較高溫度的環境，例如汽車引擎的進氣歧管、重型機車的排氣管、自行車的輪圈、以及電子零組件等。一般的高Tg樹脂系統往往有韌性不足、預浸布壽命太短、黏度太高等缺點，造成製造的困難。新一代環氧樹脂系統則改善了這些缺點，提供良好的加工性與物理性質。

High Tg composites can be used under higher temperature environment, such as engine intake manifold, motorcycle tailpipe, bicycle rim, and electronic devices. Normally the drawbacks of these systems are insufficient toughness, poor prepreg pot life, and high viscosity. New epoxy formulation can provide convenient manufacturing process and good physical properties.

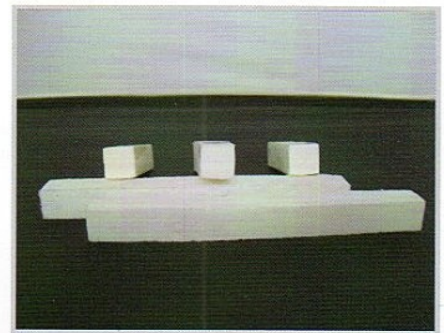
### 高Tg環氧樹脂 / Hotmelt Type Epoxy for high Tg

產品編號 Product No.	樹脂/硬化劑 Resin / Curing agent	顏色 Color	黏度 Viscosity	硬化條件 Curing Procedure	玻璃轉移溫度 Tg
NA979	Epoxy / DICY	黃色 Yellow	20,000 (70°C)	150°C / 0.5hr +200°C / 1hr	175°C
NC214	Epoxy / DICY	黃色 Yellow	22,000 (70°C)	150°C / 0.5hr +200°C / 1hr	185°C

## 輔助材料

複合材料的製程，需要搭配許多的功能性產品，例如補土、金油、以及發泡材料。這些輔助性的材料對於製程以及產品的外觀有非常重要的影響。一般玻璃補土的接著強度不足，容易在震動環境下剝落，造成產品的缺陷。使用環氧系統的補土則展現出良好的接著性、透明度，並且具備搖變性，適合填補各種形狀的空洞。

Many functional products are used during the manufacturing of composites, such as putty, varnish, and blowing agent. These auxiliary products have significant effect on the manufacturing process and the appearance of the composites. Normally poly putty has poor adhesion strength, thus peel off easily under vibration. Epoxy putty has good adhesion properties, clear appearance, and also thixotropic properties, thus suitable to fill the vacancies in different sizes.



發泡材料 Blowing material

### 輔助材料 / Auxillary Products

產品編號 Product No.	顏色 Color	黏度 Viscosity	硬化條件 Curing Procedure	其他條件1 Other Properties	其他條件2 Other Properties
補土 Putty JC094-5	灰色 Gray	1,400,000~2,800,000	130°C / 30 min	玻璃轉移溫度 Tg 88°C	硬度 Hardness 87(Shore D)
金油 Varnish NB168	透明無色 Colorless	岩田杯 Iwata 14秒 14 seconds	80°C / 10 min	固含量 RC 25%	鉛筆硬度 Pencil Hardness 2H
發泡材料 Blowing agent NC198	淡黃色 Yellowish	麵團狀 Paste	150°C / 10 min	發泡密度 Foam Density 0.2 g/cm <sup>3</sup>	黏度和密度 可配合客戶開發

## 複合材料用環氧樹脂 / Epoxy for Composites

### 產品特色 / Feature

- 熱融膠產品不含溶劑  
Solvent-free for hotmelt products
- 耐熱性、耐撞擊性、耐濕性等  
High temperature resistance, impact resistance and moisture resistance.
- 高抗彎曲性、高韌性和高Tg產品  
High flexural resistance, high toughness and high Tg.



# Pipeline 下水道更生 Rehabilitation

永寬化學與暢同工程技術股份有限公司，共同開發一系列的工程用樹脂，使得水管更新快速又方便。傳統工法為直接開挖地面，更換新的水管。此一方法會對環境、交通、民眾生活造成嚴重影響。免開挖地下管線修復工法，其管材具有優越的防漏、耐震、使用期限長等優點，並且在施工中不需要封閉道路，沒有塵土飛揚，對民眾的影響可以降低到最少的程度。

Everwide develop a new epoxy resin system for engineering with Chino Technologies Engineering Co., Ltd. This product can make the pipe renew fast and convenient. The original method is excavating the road and renewing the water pipe. But this method would have the serious influence on the environment, transportation and people's lives. The CIPP (cure in place pipe) method exhibits leak-proof, vibration-proof and long service time. This method has little to influence the populace and have any dust during the construction period.

本系列材料適用於製作高品質的自來水、污水、瓦斯再生管，我們有充分的實務經驗，可以提供高品質及相關的產品與相關的應用技術服務。

This series is suited for regeneration pipes, such as tap water pipes, sewage pipes and gas pipes. We have plenty of practical experience to provide high quality and related products and technology services.

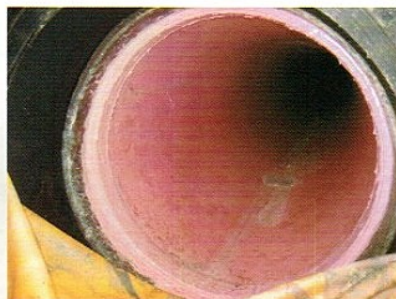


## 應用 / Application

自來水管、污水管更生  
Tap water pipe, sanitary sewer  
rehabilitation

## 產品特色 / Feature

- 防漏、耐震  
Leak-proof and vibration-proof
- 耐酸、鹼  
Chemical resistance
- 使用期限長以及施工的便捷性  
Long service time and the convenience of  
construction



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