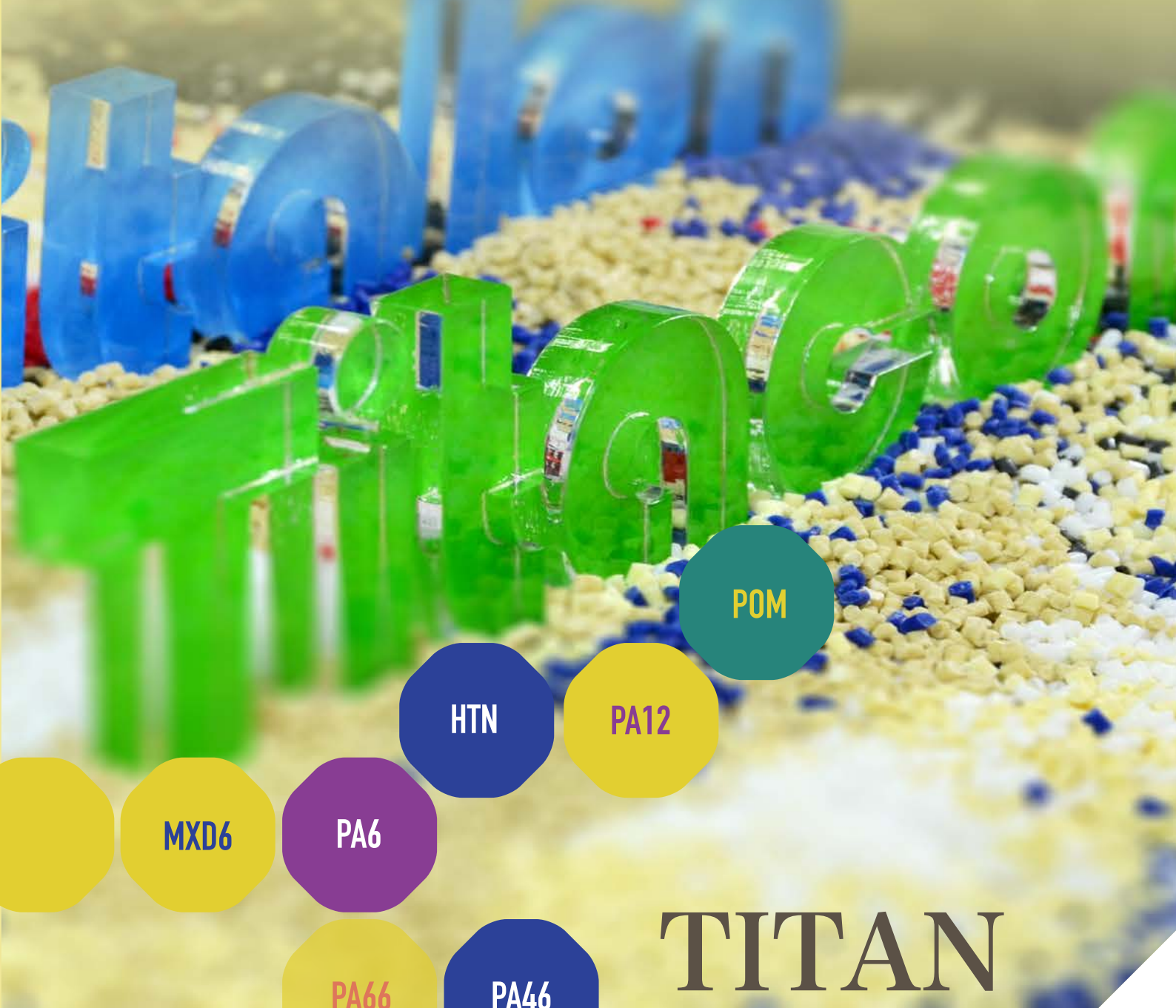




# TITAN PROPERTIES GUIDE

Best performance and cost for  
engineering plastics compounds

Special Engineering Plastic Compounds

**Titacon®**

**Titalon®**



TITAN PLASTICS COMPOUNDS CO., LTD.

ISO 9001

IATF 16949

ISO 14001

UL認證部份規格



## 工程塑膠特殊複合材料製造商

Special engineering plastic compounds

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**Titacon®**

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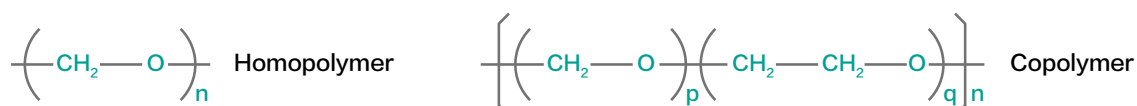
The best choice for other compounds

**Titalon®**



## ● Polyacetal (POM) Introduction

Polyacetal (POM)–also known as acetal or polyoxymethylene. From structure of polyacetal, it can be divided into homopolymer and copolymer. The homopolymer is essentially a polyoxymethylene molecular chain made from formaldehyde, while the copolymer is produced from trioxane or other comonomers. The homopolymer has slightly higher short-term mechanical properties and melts at a higher temperature, while the copolymer has higher continuous use temperature, greater alkali resistance and is less affected by long-term exposure to moisture at an elevated temperature. Their chemical structure are as followings:



## ● Polyacetal (POM) Characteristics

Polyacetal is a highly crystalline, high performance engineering polymer that displays a broad range of properties, among the most notable being low coefficient of friction, excellent wear resistance, high modulus, and resistance to many solvents and automotive fuels. Basic mechanical properties include high strength and stiffness coupled with good impact strength. Low moisture absorption results in excellent dimensional stability and makes POM an excellent candidate for parts that must exhibit tight tolerances in moist environments.

## ● Polyacetal (POM) Products Application

Industrial: Gears, bearings, convey belts, pipe fittings and hand tools.

Electrics: Gears of OA machine, appliance parts, camera parts.

Consumer Products: Clock gears, zipper, parts of baby cart, plumbing parts.

Automotive: Fuel pump module, buckle, window screen wiper parts, meter components, driving gears.

Sports: Bicycle, parts of bodybuilding equipment.

## ● Polyacetal (POM) Molding Conditions

\* For colored or reinforce resins, please consult with Titan Plastics Compounds Co., Ltd.

|                                   |                 |
|-----------------------------------|-----------------|
| <b>Predrying:</b>                 | 80–90°C 3–4 hrs |
| <b>Material melt temperature:</b> | 180–210°C       |
| <b>Mold temperature:</b>          | >50°C           |
| <b>Injection speed:</b>           | 0.5–3m/min      |
| <b>Injection pressure:</b>        | 49–98Mpa        |
| <b>Screw rotation:</b>            | 50–150rpm       |

### Resin temperature:

Copolymer: Optimum 180–210°C Maximum 230°C

Homopolymer: Optimum 190–200°C , Maximum 210°C

### Maximum cylinder residence time (non-reinforced non-colored resin):

50 min. at 190°C

40 min. at 200°C

30 min. at 210°C



## ● 強化、填充、耐磨擦、抗靜電、導電等級

| 項目<br>Grade name                | 單位<br>Unit        | ISO<br>測試方法<br>ISO<br>Testing<br>method | 玻璃纖維強化 Glass Fiber      |                         |                         |                         |                         |                               |                               | 玻璃珠填充<br>Glass Beads                 |                       |                       |
|---------------------------------|-------------------|-----------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------------|-------------------------------|--------------------------------------|-----------------------|-----------------------|
|                                 |                   |                                         | GF910                   | GF915                   | GF920                   | GF925                   | GF930                   | GF520                         | GF525                         | GB910L                               | GB915                 | GB920                 |
| 特點<br>Characteristics           | -                 | -                                       | 10%<br>Glass<br>Fiber   | 15%<br>Glass<br>Fiber   | 20%<br>Glass<br>Fiber   | 25%<br>Glass<br>Fiber   | 30%<br>Glass<br>Fiber   | 20%<br>Glass<br>Fiber         | 25%<br>Glass<br>Fiber         | 10%<br>Glass<br>Beads                | 15%<br>Glass<br>Beads | 20%<br>Glass<br>Beads |
|                                 |                   |                                         | 高強度<br>high<br>strength | 高強度<br>high<br>strength | 高強度<br>high<br>strength | 高強度<br>high<br>strength | 高強度<br>high<br>strength | 高強度<br>單聚<br>Homo-<br>polymer | 高強度<br>單聚<br>Homo-<br>polymer | 低翹曲<br>潤滑性<br>low warp<br>lubricated | 低翹曲<br>low<br>warp    | 低翹曲<br>low<br>warp    |
| 比重<br>Specific gravity          | g/cm <sup>3</sup> | 1183                                    | 1.48                    | 1.51                    | 1.54                    | 1.59                    | 1.62                    | 1.55                          | 1.59                          | 1.48                                 | 1.52                  | 1.56                  |
| 拉伸強度<br>Tensile strength        | MPa               | 527-1,2                                 | 88                      | 105                     | 120                     | 135                     | 145                     | 125                           | 140                           | 52                                   | 50                    | 48                    |
| 拉伸率<br>Tensile elongation       | %                 | 527-1,2                                 | 3                       | 3                       | 3                       | 3                       | 2                       | 3                             | 3                             | 35                                   | 20                    | 20                    |
| 彎曲強度<br>Flexural strength       | MPa               | 178                                     | 125                     | 150                     | 180                     | 200                     | 210                     | 180                           | 190                           | 82                                   | 80                    | 77                    |
| 彎曲模數<br>Flexural modulus        | MPa               | 178                                     | 4,250                   | 5,200                   | 6,400                   | 7,500                   | 9,700                   | 7,500                         | 8,400                         | 3,000                                | 2,950                 | 2,920                 |
| 衝擊強度<br>(缺口)<br>Charpy(notched) | kJ/m <sup>2</sup> | 179/1eA                                 | 5                       | 6                       | 8                       | 9                       | 11                      | 7                             | 10                            | 5                                    | 4                     | 4                     |
| 熱變形溫度<br>DTUL(1.8Mpa)           | ℃                 | 75-1,2                                  | 150                     | 153                     | 158                     | 160                     | 163                     | 155                           | 170                           | 100                                  | 105                   | 107                   |
| 體積阻抗<br>Volume resistivity      | Ω.cm              | IEC<br>60093                            | 10E14                   | 10E14                   | 10E14                   | 10E14                   | 10E14                   | 10E14                         | 10E14                         | 10E14                                | 10E14                 | 10E14                 |
| 表面阻抗<br>Surface resistivity     | Ω                 | IEC<br>60093                            | 10E15                   | 10E15                   | 10E15                   | 10E15                   | 10E15                   | 10E15                         | 10E15                         | 10E15                                | 10E15                 | 10E15                 |
| 耐燃性<br>Flammability             | -                 | UL 94                                   | HB                      | HB                      | HB                      | HB                      | HB                      | HB                            | HB                            | HB                                   | HB                    | HB                    |
| 模收縮<br>Mold shrinkage           | %                 | 50×70×3<br>mmt                          | 0.9-1.3                 | 0.8-1.2                 | 0.7-1.1                 | 0.6-1.0                 | 0.5-0.9                 | 0.7-1.1                       | 0.6-1.0                       | 1.3-1.9                              | 1.2-1.6               | 1.3-1.5               |

| GB925                 | 礦物填充 Mineral       |                    | 永久抗靜電<br>Anti-static / conductive                   |                                       |                                                | 碳纖維強化<br>Carbon Fiber                         |                                               | 抗 UV<br>Weather Resistant    |                                                         | 耐磨耗<br>Wear resistance                                |                           |
|-----------------------|--------------------|--------------------|-----------------------------------------------------|---------------------------------------|------------------------------------------------|-----------------------------------------------|-----------------------------------------------|------------------------------|---------------------------------------------------------|-------------------------------------------------------|---------------------------|
|                       | TR905              | TR720              | ST915                                               | EX910                                 | NC710                                          | CF910                                         | CF920                                         | UV900                        | GF925UV                                                 | KG920                                                 | MS902                     |
| 25%<br>Glass<br>Beads | 5%<br>Mineral      | 15%<br>Mineral     |                                                     | Carbon<br>Powder                      | Carbon<br>nanotube                             | 10%<br>Carbon<br>Fiber                        | 20%<br>Carbon<br>Fiber                        |                              | 25%<br>Glass Fiber                                      | 20%<br>Whisker                                        | 2.5%<br>MoS2              |
| 低翹曲<br>low<br>warp    | 低翹曲<br>low<br>warp | 低翹曲<br>low<br>warp | 抗靜電<br>可染色<br>permanent<br>anti-static<br>colorable | 抗靜電<br>anti-static<br>carbon<br>black | 抗靜電<br>潔淨度<br>anti-static<br>high<br>cleanness | 高剛性<br>耐磨導電<br>high<br>strength<br>conductive | 高剛性<br>耐磨導電<br>high<br>strength<br>conductive | 耐候性<br>weather<br>resistance | 高強度<br>耐候性<br>high<br>strength<br>weather<br>resistance | 高剛性<br>耐磨耗<br>High<br>stiffness<br>Wear<br>resistance | 高滑動<br>wear<br>resistance |
| 1.59                  | 1.44               | 1.53               | 1.40                                                | 1.48                                  | 1.4                                            | 1.44                                          | 1.47                                          | 1.41                         | 1.59                                                    | 1.59                                                  | 1.44                      |
| 45                    | 62                 | 59                 | 45                                                  | 45                                    | 45                                             | 110                                           | 140                                           | 62                           | 110                                                     | 60                                                    | 60                        |
| 20                    | 12                 | 10                 | 25                                                  | 20                                    | 8                                              | 2                                             | 2.5                                           | 35                           | 2.5                                                     | 11                                                    | 25                        |
| 75                    | 90                 | 96                 | 60                                                  | 70                                    | 68                                             | 155                                           | 200                                           | 87                           | 170                                                     | 100                                                   | 87                        |
| 3,100                 | 3,000              | 3,500              | 1,300                                               | 1,750                                 | 2,100                                          | 7,500                                         | 12,000                                        | 2,500                        | 6,500                                                   | 3,800                                                 | 2,500                     |
| 3                     | 6                  | 3                  | 8                                                   | 5                                     | 3                                              | 4                                             | 6                                             | 10                           | 7                                                       | 4                                                     | 11                        |
| 110                   | 108                | 125                | 95                                                  | 95                                    | 89                                             | 160                                           | 163                                           | 95                           | 158                                                     | 125                                                   | 110                       |
| 10E14                 | 10E14              | 10E14              | 10E9                                                | 10E5                                  | 10E4                                           | 10E3                                          | 10E3                                          | 10E14                        | 10E14                                                   | 10E14                                                 | 10E14                     |
| 10E15                 | 10E15              | 10E15              | 10E9                                                | 10E5                                  | 10E4                                           | 10E4                                          | 10E3                                          | 10E15                        | 10E15                                                   | 10E15                                                 | 10E14                     |
| HB                    | HB                 | HB                 | HB                                                  | HB                                    | HB                                             | HB                                            | HB                                            | HB                           | HB                                                      | HB                                                    | HB                        |
| 1.2-1.4               | 1.8-2.0            | 1.5-1.7            | 1.8-2.2                                             | 1.6-2.0                               | 1.6-2.0                                        | 0.5-1.0                                       | 0.3-0.8                                       | 1.8-2.1                      | 0.6-0.9                                                 | 1.0-1.6                                               | 1.8-2.0                   |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



# POM工程塑膠複合材料

The best choice for POM compounds

● 耐氣候、抗 UV、耐磨擦、耐磨耗、耐衝擊等級

| 項目<br>Grade name                | 單位<br>Unit        | ISO<br>測試方法<br>ISO<br>Testing<br>method | 耐磨耗 Wear resistance       |                                      |                                      |                                      |                  |                                            |                         |                           |                           |
|---------------------------------|-------------------|-----------------------------------------|---------------------------|--------------------------------------|--------------------------------------|--------------------------------------|------------------|--------------------------------------------|-------------------------|---------------------------|---------------------------|
|                                 |                   |                                         | MS904                     | EW901                                | CW901                                | NW901                                | OL900            | CL500                                      | SI902                   | TF905                     | TF910                     |
| 特點<br>Characteristics           | -                 | -                                       | 4%<br>MoS2                |                                      |                                      |                                      |                  |                                            | 2%<br>Silicone          | 5%<br>PTFE                | 10%<br>PTFE               |
|                                 |                   |                                         | 高滑動<br>wear<br>resistance | 潤滑性<br>低噪音<br>Low noise<br>Lubricity | 潤滑性<br>低噪音<br>Low noise<br>Lubricity | 潤滑性<br>低噪音<br>Low noise<br>Lubricity | 潤滑性<br>Lubricity | 潤滑性<br>單聚<br>Homo-<br>polymer<br>Lubricity | 潤滑性<br>滑動性<br>Lubricity | 耐磨耗<br>wear<br>resistance | 耐磨耗<br>wear<br>resistance |
| 比重<br>Specific gravity          | g/cm <sup>3</sup> | 1183                                    | 1.45                      | 1.37                                 | 1.42                                 | 1.36                                 | 1.39             | 1.38                                       | 1.40                    | 1.43                      | 1.46                      |
| 拉伸強度<br>Tensile strength        | MPa               | 527-1,2                                 | 61                        | 55                                   | 50                                   | 52                                   | 45               | 60                                         | 57                      | 58                        | 54                        |
| 拉伸率<br>Tensile elongation       | %                 | 527-1,2                                 | 20                        | 25                                   | 20                                   | 30                                   | 30               | 25                                         | 40                      | 24                        | 20                        |
| 彎曲強度<br>Flexural strength       | MPa               | 178                                     | 90                        | 75                                   | 75                                   | 73                                   | 60               | 80                                         | 76                      | 80                        | 75                        |
| 彎曲模數<br>Flexural modulus        | MPa               | 178                                     | 2,550                     | 2,350                                | 2,700                                | 2,200                                | 1,800            | 2,650                                      | 2,200                   | 2,350                     | 2,200                     |
| 衝擊強度<br>(缺口)<br>Charpy(notched) | kJ/m <sup>2</sup> | 179/1eA                                 | 10                        | 5.5                                  | 5                                    | 7.5                                  | 6                | 9                                          | 10                      | 7.5                       | 6                         |
| 熱變形溫度<br>DTUL(1.8Mpa)           | ℃                 | 75-1,2                                  | 110                       | 80                                   | 80                                   | 85                                   | 90               | 95                                         | 80                      | 90                        | 82                        |
| 體積阻抗<br>Volume resistivity      | Ω.cm              | IEC 60093                               | 10E14                     | 10E14                                | 10E14                                | 10E14                                | 10E14            | 10E14                                      | 10E14                   | 10E14                     | 10E14                     |
| 表面阻抗<br>Surface resistivity     | Ω                 | IEC 60093                               | 10E15                     | 10E14                                | 10E14                                | 10E15                                | 10E14            | 10E14                                      | 10E15                   | 10E14                     | 10E14                     |
| 耐燃性<br>Flammability             | -                 | UL 94                                   | HB                        | HB                                   | HB                                   | HB                                   | HB               | HB                                         | HB                      | HB                        | HB                        |
| 模收縮<br>Mold shrinkage           | %                 | 50×70×3<br>mmt                          | 1.8-2.0                   | 2.0-2.2                              | 1.6-2.0                              | 2.0-2.2                              | 1.6-2.0          | 1.6-2.0                                    | 1.8-2.2                 | 1.8-2.0                   | 1.8-2.0                   |

|                           |                                |                               |                               |                          |                                  | 耐衝擊<br>High Impact / Tough         |                                    |                                                          |                                                          |                                                          |
|---------------------------|--------------------------------|-------------------------------|-------------------------------|--------------------------|----------------------------------|------------------------------------|------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| TF920                     | GF920TF10                      | TF502                         | TF410                         | TF420                    | TF918K7                          | TX910                              | TX915                              | TX920                                                    | TX925                                                    | TX940                                                    |
| 20%<br>PTFE               | PTFE<br>Glass Fiber            | 2%<br>PTFE                    | 10%<br>PTFE                   | 20%<br>PTFE              | PTFE<br>Aramid<br>Fiber          |                                    |                                    |                                                          |                                                          |                                                          |
| 耐磨耗<br>wear<br>resistance | 耐磨耗<br>高強度<br>high<br>strength | 耐磨耗<br>單聚<br>Homo-<br>polymer | 耐磨耗<br>單聚<br>Homo-<br>polymer | 耐磨耗<br>單聚<br>homopolymer | 高剛性<br>耐磨耗<br>wear<br>resistance | 柔韌性<br>high<br>impact<br>toughness | 柔韌性<br>high<br>impact<br>toughness | 柔韌性<br>低溫耐衝<br>low<br>temperature<br>impact<br>toughness | 柔韌性<br>低溫耐衝<br>low<br>temperature<br>impact<br>toughness | 柔韌性<br>低溫耐衝<br>low<br>temperature<br>impact<br>toughness |
| 1.52                      | 1.60                           | 1.42                          | 1.46                          | 1.52                     | 1.50                             | 1.38                               | 1.37                               | 1.35                                                     | 1.34                                                     | 1.32                                                     |
| 49                        | 115                            | 70                            | 62                            | 55                       | 57                               | 50                                 | 43                                 | 40                                                       | 36                                                       | 30                                                       |
| 15                        | 3                              | 20                            | 16                            | 13                       | 12                               | 45                                 | 60                                 | 90                                                       | 90                                                       | 100                                                      |
| 68                        | 170                            | 95                            | 90                            | 80                       | 80                               | 65                                 | 52                                 | 50                                                       | 45                                                       | 30                                                       |
| 2,000                     | 6500                           | 3,000                         | 2,850                         | 2,700                    | 2,700                            | 1,700                              | 1,600                              | 1,450                                                    | 1,250                                                    | 850                                                      |
| 5                         | 8                              | 8.5                           | 6.5                           | 6                        | 7                                | 12                                 | 13                                 | 15                                                       | 18                                                       | 30                                                       |
| 80                        | 140                            | 95                            | 90                            | 85                       | 80                               | 87                                 | 78                                 | 75                                                       | 75                                                       | 70                                                       |
| 10E14                     | 10E14                          | 10E14                         | 10E14                         | 10E14                    | 10E14                            | 10E14                              | 10E14                              | 10E14                                                    | 10E14                                                    | 10E14                                                    |
| 10E14                     | 10E15                          | 10E14                         | 10E14                         | 10E14                    | 10E15                            | 10E14                              | 10E14                              | 10E14                                                    | 10E14                                                    | 10E14                                                    |
| HB                        | HB                             | HB                            | HB                            | HB                       | HB                               | HB                                 | HB                                 | HB                                                       | HB                                                       | HB                                                       |
| 1.6-2.0                   | 0.6-1.0                        | 1.8-2.0                       | 1.8-2.2                       | 1.8-2.0                  | 1.4-1.8                          | 1.8-2.0                            | 1.8-2.0                            | 1.6-2.0                                                  | 1.6-2.0                                                  | 1.4-1.8                                                  |

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## ● PA6 (Nylon6)

| PA6 Characteristics:                              | PA6 Processing Conditions:           |
|---------------------------------------------------|--------------------------------------|
| (1) Good impact, tougher than PA66                | (1) Drying:80℃ x3~4hrs               |
| (2) Chemical resistance to hydrocarbon            | (2) Injection temperature:230℃ ~275℃ |
| (3) Excellent surface finish even when reinforced | (3) Mold temperature:70℃ ~110℃       |
| (4) High water absorption than PA66               |                                      |

### PA6 Product Application :

Nylon 6 is a tough, abrasion-resistant and lightweight material. It has improved surface appearance, creep resistance, and processability compared to nylon 66. It is suitable to mold into bearing or tools requiring good impact strength. The toughness PA6 is better than POM, but its stiffness and toughness can not compete with PC(polycarbonate). Nylon 6 is easy to absorb moisture. And its impact strength and general energy absorbing characteristic will increase significantly when it absorbs moisture. For Glass Fiber reinforced grades, it can be used in high temperature up to 200℃ , so it can be a good candidate for industrial tools.

## ● PA66 (Nylon66)

| PA66 Characteristics:                        | PA66 Processing Conditions:                                                 |
|----------------------------------------------|-----------------------------------------------------------------------------|
| (1) Good strength and stiffness              | (1) Drying:80℃ x3~4 hrs or 110~120℃ x2~3 hrs                                |
| (2) Chemical resistance to hydrocarbon       | (2) Injection temperature:265℃ ~295℃                                        |
| (3) Excellent wear resistance and lubricity  | (3) Mold temperature:70℃ ~110℃                                              |
| (4) Heat resistance higher than PA6          | (4) Screw revolution:50~70 rpm, back pressure:0~5 kg/cm <sup>2</sup>        |
| (5) Easy to molding with wide process window | (5) Injection pressure:700~1300 kg/cm <sup>2</sup> , injection speed 50~70% |

### PA 66 Product Application

Nylon 66 allows it to be used in almost any application that requires high physical strength, ductility, heat resistance and chemical resistance. Therefore, Nylon 66 is one of the most versatile engineering thermoplastics. It is also an outstanding candidate for metal replacement applications. The use of internal lubricants in Nylon 66 significantly improves on the ready excellent wear resistance and friction properties. Thus it is to be used widely in industrial parts requiring wear resistance.



## ● PA12 (Nylon12)

| PA12 Characteristics:                                                   | PA12 Processing Conditions:                        |
|-------------------------------------------------------------------------|----------------------------------------------------|
| (1) Low water absorption, stable dimension                              | (1) Drying:80°C x3~4hrs                            |
| (2) Balanced mechanical properties in low temperature                   | (2) Injection temperature:190°C ~220°C             |
| (3) Wear resistance, excellent impact, weather resistance and lubricity | (3) Mold temperature:80°C                          |
| (4) Good chemical resistance                                            | (4) Injection pressure:600~1000kg/ cm <sup>2</sup> |
| (5) Ability to accept high loading of fillers                           |                                                    |

### PA12 Product Application :

Nylon 12 has an outstanding chemical resistance, excellent durability as well as wide range of flexibility. It is widely used in automobile field such as hose, tube, connector holder and fuel parts. Due to its low water absorption, dimensional stability and wear resistance, it is also used as the material for industrial parts requiring high performance.

## ● PA46 (Nylon46)

| PA46 Characteristics:                                               | PA46 Processing Conditions:            |
|---------------------------------------------------------------------|----------------------------------------|
| (1) Excellent mechanical properties in high temperature environment | (1) Drying:80°C x3~4 hrs               |
| (2) Good chemical resistance                                        | (2) Injection temperature:300°C ~320°C |
| (3) Outstanding wear and abrasion resistance for moving parts       | (3) Mold temperature:80°C ~150°C       |
| (4) Excellent chemical resistance and low flash                     | (4) Injection speed:fast velocity      |
| (5) Cycle time is faster than PPS, PA6T and PCT due to high crystal |                                        |
| (6) Replacement of thermoset and high cost plastics                 |                                        |

### PA46 Product Application :

Automotive:transmission components, timing system, gear, lamp fittings and electrical parts.

Electrics:connectors and PCB mounted components.

Industrial:parts required heat resistance, vibrations and impact

Motorcycle:oil pump gears, balancer gears, sprockets, CVT-weight rollers, spacers, timing parts and electrical components





# PA系列工程塑膠複合材料

The best choice for PA compounds

## ● 尼龍 (PA) (Nylon) 6

| 項目<br>Grade name             | 單位<br>Unit        | ISO<br>測試方法<br>ISO<br>Testing<br>method | 玻璃纖維強化 Glass Fiber        |                           |                           |                           |                           |                           |                           |
|------------------------------|-------------------|-----------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                              |                   |                                         | 1100GF                    | 1150GF                    | 1200GF                    | 1300GF                    | 1400GF                    | 1450GF                    | 1500GF                    |
| 特點<br>Characteristics        | —                 | —                                       | PA6<br>10%<br>Glass Fiber | PA6<br>15%<br>Glass Fiber | PA6<br>20%<br>Glass Fiber | PA6<br>30%<br>Glass Fiber | PA6<br>40%<br>Glass Fiber | PA6<br>45%<br>Glass Fiber | PA6<br>50%<br>Glass Fiber |
|                              |                   |                                         | 高強度<br>high<br>strength   | 高強度<br>high<br>strength   | 高強度<br>high<br>strength   | 高強度<br>high<br>strength   | 高強度<br>high<br>strength   | 高強度<br>high<br>strength   | 高強度<br>high<br>strength   |
| 比重<br>Specific gravity       | g/cm <sup>3</sup> | 1183                                    | 1.20                      | 1.25                      | 1.30                      | 1.38                      | 1.45                      | 1.5                       | 1.57                      |
| 拉伸強度<br>Tensile strength     | MPa               | 527-1,2                                 | 100                       | 105                       | 140                       | 155                       | 190                       | 205                       | 215                       |
| 拉伸率<br>Tensile elongation    | %                 | 527-1,2                                 | 3                         | 3                         | 3                         | 3                         | 4                         | 4                         | 4                         |
| 彎曲強度<br>Flexural strength    | MPa               | 178                                     | 150                       | 160                       | 208                       | 235                       | 290                       | 305                       | 325                       |
| 彎曲模數<br>Flexural modulus     | MPa               | 178                                     | 4,100                     | 5,200                     | 6,300                     | 7,500                     | 10,500                    | 11,500                    | 13,000                    |
| 衝擊強度 (缺口)<br>Charpy(notched) | kJ/m <sup>2</sup> | 179/1eA                                 | 5                         | 6                         | 9                         | 12                        | 16                        | 17                        | 18                        |
| 熱變形溫度<br>DTUL(1.8Mpa)        | °C                | 75-1,2                                  | 170                       | 180                       | 190                       | 204                       | 210                       | 210                       | 210                       |
| 體積阻抗<br>Volume resistivity   | Ω.cm              | IEC<br>60093                            | 10E13                     | 10E13                     | 10E13                     | 10E13                     | 10E13                     | 10E13                     | 10E13                     |
| 表面阻抗<br>Surface resistivity  | Ω                 | IEC<br>60093                            | 10E14                     | 10E14                     | 10E14                     | 10E14                     | 10E14                     | 10E14                     | 10E14                     |
| 耐燃性<br>Flammability          | —                 | UL 94                                   | HB                        | HB                        | HB                        | HB                        | HB                        | HB                        | HB                        |
| 模收縮<br>Mold shrinkage        | %                 | 50 × 70 × 3<br>mmt                      | 0.4-0.8                   | 0.4-0.7                   | 0.3-0.7                   | 0.2-0.6                   | 0.2-0.6                   | 0.2-0.5                   | 0.2-0.5                   |

|                           | 超韌級 High toughness                 |                                    |                                    | 玻璃纖維強化 耐衝擊<br>High strength impact    |                                       |                                       | 低翹曲 Low warp                           |                       |                       |
|---------------------------|------------------------------------|------------------------------------|------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|----------------------------------------|-----------------------|-----------------------|
| 1504AN                    | 1100ST                             | 1200ST                             | 1340ST                             | 1200GFT                               | 1300GFT                               | 1450GFT                               | 1300GB                                 | 1200TC                | 1300TC                |
| PA6<br>60%<br>Glass Fiber | PA6<br>10%<br>POE                  | PA6<br>20%<br>POE                  | PA6<br>34%<br>POE                  | PA6<br>20%<br>Glass Fiber             | PA6<br>30%<br>Glass Fiber             | PA6<br>45%<br>Glass Fiber             | PA6<br>30%<br>Glass Beads              | PA6<br>20%<br>Mineral | PA6<br>30%<br>Mineral |
| 高強度<br>high<br>strength   | 耐衝擊<br>high<br>toughness<br>impact | 耐衝擊<br>high<br>toughness<br>impact | 耐衝擊<br>high<br>toughness<br>impact | 高強度<br>耐衝擊<br>High strength<br>impact | 高強度<br>耐衝擊<br>High strength<br>impact | 高強度<br>耐衝擊<br>High strength<br>impact | 低翹曲<br>耐刮性<br>Low warp<br>Anti scratch | 低翹曲<br>Low warp       | 低翹曲<br>Low warp       |
| 1.69                      | 1.11                               | 1.08                               | 1.05                               | 1.25                                  | 1.30                                  | 1.45                                  | 1.36                                   | 1.31                  | 1.34                  |
| 230                       | 55                                 | 45                                 | 35                                 | 110                                   | 120                                   | 150                                   | 70                                     | 60                    | 55                    |
| 4                         | 50                                 | 65                                 | 100                                | 2                                     | 5                                     | 4                                     | 15                                     | 6                     | 7                     |
| 340                       | 70                                 | 55                                 | 40                                 | 160                                   | 170                                   | 220                                   | 120                                    | 90                    | 95                    |
| 14,000                    | 1,920                              | 1,720                              | 950                                | 4,800                                 | 6,500                                 | 9,000                                 | 4,000                                  | 3,000                 | 4,500                 |
| 16                        | 25                                 | 60                                 | NB                                 | 15                                    | 30                                    | 25                                    | 4.5                                    | 7                     | 6                     |
| 210                       | 60                                 | 55                                 | 55                                 | 170                                   | 190                                   | 190                                   | 90                                     | 80                    | 90                    |
| 10E13                     | 10E14                              | 10E14                              | 10E14                              | 10E13                                 | 10E13                                 | 10E13                                 | 10E13                                  | 10E13                 | 10E13                 |
| 10E14                     | 10E14                              | 10E14                              | 10E14                              | 10E14                                 | 10E14                                 | 10E14                                 | 10E14                                  | 10E14                 | 10E14                 |
| HB                        | HB                                 | HB                                 | HB                                 | HB                                    | HB                                    | HB                                    | HB                                     | HB                    | HB                    |
| 0.2-0.4                   | 1.3-1.8                            | 1.4-1.8                            | 1.4-1.8                            | 0.4-0.8                               | 0.3-0.7                               | 0.2-0.6                               | 0.6-1.0                                | 0.9-1.2               | 0.8-1.1               |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



# PA系列工程塑膠複合材料

The best choice for PA compounds

## ● 尼龍 (PA) (Nylon) 6

| 項目<br>Grade name             | 單位<br>Unit        | ISO<br>測試方法<br>ISO<br>Testing<br>method | 碳纖維強化<br>Carbon Fiber                        |                                              |                                              | 超高強度、強韌性<br>High strength impact |                           |                           |                                       |
|------------------------------|-------------------|-----------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------|---------------------------|---------------------------|---------------------------------------|
|                              |                   |                                         | 1100CF                                       | 1200CF                                       | 1300CF                                       | 1150HS                           | 1300HS                    | 1400HS                    | 1300HST                               |
| 特點<br>Characteristics        | —                 | —                                       | PA6<br>10%<br>Carbon Fiber                   | PA6<br>20%<br>Carbon Fiber                   | PA6<br>30%<br>Carbon Fiber                   | PA6<br>15%<br>Class Fiber        | PA6<br>30%<br>Class Fiber | PA6<br>40%<br>Class Fiber | PA6<br>30%<br>Class Fiber             |
|                              |                   |                                         | 高剛性<br>導電性<br>high<br>strength<br>conductive | 高剛性<br>導電性<br>high<br>strength<br>conductive | 高剛性<br>導電性<br>high<br>strength<br>conductive | 高強度<br>High<br>strength          | 高強度<br>High<br>strength   | 高強度<br>High<br>strength   | 高強韌<br>耐衝擊<br>High strength<br>impact |
| 比重<br>Specific gravity       | g/cm <sup>3</sup> | 1183                                    | 1.17                                         | 1.22                                         | 1.27                                         | 1.25                             | 1.30                      | 1.45                      | 1.30                                  |
| 拉伸強度<br>Tensile strength     | MPa               | 527-1,2                                 | 160                                          | 200                                          | 220                                          | 130                              | 180                       | 210                       | 160                                   |
| 拉伸率<br>Tensile elongation    | %                 | 527-1,2                                 | 3                                            | 3                                            | 3                                            | 4                                | 5                         | 4                         | 5                                     |
| 彎曲強度<br>Flexural strength    | MPa               | 178                                     | 220                                          | 260                                          | 320                                          | 195                              | 275                       | 315                       | 250                                   |
| 彎曲模數<br>Flexural modulus     | MPa               | 178                                     | 5,500                                        | 12,000                                       | 18,000                                       | 5200                             | 9000                      | 13000                     | 8200                                  |
| 衝擊強度 (缺口)<br>Charpy(notched) | kJ/m <sup>2</sup> | 179/1eA                                 | 6                                            | 8                                            | 11                                           | 6                                | 14                        | 18                        | 22                                    |
| 熱變形溫度<br>DTUL(1.8Mpa)        | °C                | 75-1,2                                  | 195                                          | 210                                          | 210                                          | 180                              | 205                       | 210                       | 190                                   |
| 體積阻抗<br>Volume resistivity   | Ω.cm              | IEC<br>60093                            | 10E4                                         | 10E4                                         | 10E4                                         | 10E13                            | 10E13                     | 10E13                     | 10E13                                 |
| 表面阻抗<br>Surface resistivity  | Ω                 | IEC<br>60093                            | 10E5                                         | 10E5                                         | 10E5                                         | 10E14                            | 10E14                     | 10E14                     | 10E14                                 |
| 耐燃性<br>Flammability          | —                 | UL 94                                   | HB                                           | HB                                           | HB                                           | HB                               | HB                        | HB                        | HB                                    |
| 模收縮<br>Mold shrinkage        | %                 | 50X70X3<br>mmt                          | 0.3-0.7                                      | 0.2-0.6                                      | 0.2-0.5                                      | 0.4-0.7                          | 0.2-0.6                   | 0.2-0.6                   | 0.3-0.7                               |

● 尼龍 (PA) (Nylon) 66 ●

|                                    |                                    | 玻璃纖維強化 Glass Fiber         |                            |                            |                                |                                          |                            |                                          | 超韌級<br>High Toughness | 高強度<br>耐衝擊<br>High Strength Impact |
|------------------------------------|------------------------------------|----------------------------|----------------------------|----------------------------|--------------------------------|------------------------------------------|----------------------------|------------------------------------------|-----------------------|------------------------------------|
| 1400HST                            | 1500HST                            | 2150GF                     | 2330GF                     | 2133GF                     | 2330FR-G                       | 2330AGF                                  | 2430AGF                    | 2500AGF                                  | 2200STS-2             | 2133GFT                            |
| PA6<br>40%<br>Class Fiber          | PA6<br>50%<br>Class Fiber          | PA66<br>15%<br>Glass Fiber | PA66<br>33%<br>Glass Fiber | PA66<br>33%<br>Glass Fiber | PA66<br>33%<br>Glass Fiber     | PA66<br>33%<br>Glass Fiber               | PA66<br>43%<br>Glass Fiber | PA66<br>50%<br>Glass Fiber               | PA66<br>20%<br>POE    | PA66<br>33%<br>Glass Fiber         |
| 高強韌<br>耐衝擊<br>High strength impact | 高強韌<br>耐衝擊<br>High strength impact | 高強度<br>High strength       | 高強度<br>High strength       | 高強度<br>High strength       | 高強度<br>無鹵阻燃<br>Flame retardant | 高強度<br>良表面<br>high strength good surface | 高強度<br>High strength       | 高強度<br>良表面<br>high strength good surface | 耐衝擊<br>High toughness | 高強度<br>耐衝擊<br>High strength impact |
| 1.40                               | 1.53                               | 1.24                       | 1.39                       | 1.39                       | 1.38                           | 1.39                                     | 1.48                       | 1.56                                     | 1.08                  | 1.39                               |
| 162                                | 195                                | 130                        | 180                        | 175                        | 140                            | 180                                      | 200                        | 225                                      | 50                    | 130                                |
| 5                                  | 5                                  | 3                          | 2.5                        | 3                          | 2                              | 2.5                                      | 2                          | 3                                        | 40                    | 5                                  |
| 252                                | 310                                | 200                        | 265                        | 260                        | 210                            | 270                                      | 300                        | 330                                      | 65                    | 200                                |
| 9600                               | 13100                              | 5,500                      | 9200                       | 8,800                      | 8,500                          | 9,000                                    | 12,000                     | 13,500                                   | 1,600                 | 7,000                              |
| 33                                 | 23                                 | 10                         | 11                         | 13                         | 10                             | 11                                       | 17                         | 17                                       | NB                    | 21                                 |
| 190                                | 200                                | 230                        | 240                        | 210                        | 200                            | 230                                      | 240                        | 240                                      | 60                    | 190                                |
| 10E13                              | 10E13                              | 10E13                      | 10E13                      | 10E13                      | 10E13                          | 10E13                                    | 10E13                      | 10E13                                    | 10E15                 | 10E13                              |
| 10E14                              | 10E14                              | 10E14                      | 10E14                      | 10E14                      | 10E14                          | 10E14                                    | 10E14                      | 10E14                                    | 10E14                 | 10E14                              |
| HB                                 | HB                                 | HB                         | HB                         | HB                         | V0                             | HB                                       | HB                         | HB                                       | HB                    | HB                                 |
| 0.2-0.6                            | 0.2-0.5                            | 0.3-0.7                    | 0.2-0.6                    | 0.2-0.6                    | 0.2-0.6                        | 0.2-0.5                                  | 0.2-0.5                    | 0.2-0.4                                  | 1.2-1.6               | 0.3-0.7                            |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



# PA系列工程塑膠複合材料

The best choice for PA compounds

## ● 尼龍 (PA) (Nylon) 66

| 項目<br>Grade name             | 單位<br>Unit        | ISO<br>測試方法<br>ISO<br>Testing<br>method | 碳纖維強化 Carbon Fiber                   |                                      |                                      |                                      |                                          |                                                     |                                              |
|------------------------------|-------------------|-----------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|------------------------------------------|-----------------------------------------------------|----------------------------------------------|
|                              |                   |                                         | 2150CF                               | 2200CF                               | 2300CF                               | 2400CF                               | 2158GCF                                  | 2182TFS                                             | 2305TF                                       |
| 特點<br>Characteristics        | —                 | —                                       | PA66<br>15%<br>Carbon<br>Fiber       | PA66<br>20%<br>Carbon<br>Fiber       | PA66<br>30%<br>Carbon<br>Fiber       | PA66<br>40%<br>Carbon<br>Fiber       | PA66<br>Carbon<br>Fiber<br>Glass<br>Bead | PA66<br>18%<br>PTFE                                 | PA66<br>Glass<br>Fiber<br>PTFE               |
|                              |                   |                                         | 高剛性<br>導電性<br>Strength<br>conductive | 高剛性<br>導電性<br>Strength<br>conductive | 高剛性<br>導電性<br>Strength<br>conductive | 高剛性<br>導電性<br>Strength<br>conductive | 高剛性<br>耐磨耗<br>Strength<br>conductive     | 高滑動<br>耐磨耗<br>High<br>sliding<br>wear<br>resistance | 高強度<br>耐磨耗<br>Strength<br>wear<br>resistance |
| 比重<br>Specific gravity       | g/cm <sup>3</sup> | 1183                                    | 1.20                                 | 1.22                                 | 1.27                                 | 1.31                                 | 1.30                                     | 1.27                                                | 1.42                                         |
| 拉伸強度<br>Tensile strength     | MPa               | 527-1,2                                 | 190                                  | 220                                  | 240                                  | 250                                  | 155                                      | 58                                                  | 165                                          |
| 拉伸率<br>Tensile elongation    | %                 | 527-1,2                                 | 3                                    | 3                                    | 3                                    | 2                                    | 3                                        | 5                                                   | 3                                            |
| 彎曲強度<br>Flexural strength    | MPa               | 178                                     | 250                                  | 300                                  | 340                                  | 370                                  | 210                                      | 90                                                  | 255                                          |
| 彎曲模數<br>Flexural modulus     | MPa               | 178                                     | 10000                                | 12700                                | 19000                                | 26000                                | 8000                                     | 1,950                                               | 8,500                                        |
| 衝擊強度 (缺口)<br>Charpy(notched) | kJ/m <sup>2</sup> | 179/1eA                                 | 6                                    | 9                                    | 11                                   | 10                                   | 4                                        | 5                                                   | 11                                           |
| 熱變形溫度<br>DTUL(1.8Mpa)        | °C                | 75-1,2                                  | 235                                  | 240                                  | 245                                  | 245                                  | 200                                      | 104                                                 | 240                                          |
| 體積阻抗<br>Volume resistivity   | Ω.cm              | IEC<br>60093                            | 10E4                                 | 10E4                                 | 10E4                                 | 10E4                                 | 10E5                                     | 10E13                                               | 10E13                                        |
| 表面阻抗<br>Surface resistivity  | Ω                 | IEC<br>60093                            | 10E5                                 | 10E5                                 | 10E5                                 | 10E5                                 | 10E6                                     | 10E14                                               | 10E14                                        |
| 耐燃性<br>Flammability          | —                 | UL 94                                   | HB                                   | HB                                   | HB                                   | HB                                   | HB                                       | HB                                                  | HB                                           |
| 模收縮<br>Mold shrinkage        | %                 | 50X70X3<br>mmt                          | 0.2-0.6                              | 0.2-0.6                              | 0.2-0.5                              | 0.1-0.4                              | 0.2-0.6                                  | 1.5-2.0                                             | 0.2-0.5                                      |

| 耐磨耗 Wear resistance                          |                                              |                                  |                                              |                                              |                                 |                           |                                              |                                                  | 低翹曲<br>Low warp            |
|----------------------------------------------|----------------------------------------------|----------------------------------|----------------------------------------------|----------------------------------------------|---------------------------------|---------------------------|----------------------------------------------|--------------------------------------------------|----------------------------|
| 2300TF                                       | 2320TF                                       | 2150TF<br>N180                   | 2150                                         | 2320                                         | 2115AF                          | 2200MS                    | 2330GMS                                      | 2102GBM                                          | 2300GB                     |
| PA66<br>Glass<br>Fiber<br>PTFE               | PA66<br>Glass<br>Fiber<br>PTFE               | PA66<br>Glass<br>Fiber<br>PTFE   | PA66<br>Glass<br>Beads<br>PTFE               | PA66<br>Glass<br>Beads<br>PTFE               | PA66<br>Aramid<br>Fiber<br>PTFE | PA66<br>2.5%<br>MoS2      | PA66<br>Glass<br>Fiber<br>MoS2               | PA66<br>Glass<br>Fiber<br>Glass<br>Beads<br>MoS2 | PA66<br>30%<br>Glass Beads |
| 高強度<br>耐磨耗<br>Strength<br>wear<br>resistance | 高強度<br>耐磨耗<br>Strength<br>wear<br>resistance | 良表面<br>耐磨耗<br>Wear<br>resistance | 低翹曲<br>耐磨耗<br>Low warp<br>Wear<br>resistance | 低翹曲<br>耐磨耗<br>Low warp<br>Wear<br>resistance | 耐磨耗<br>wear<br>resistance       | 耐磨耗<br>wear<br>resistance | 高強度<br>耐磨耗<br>Strength<br>wear<br>resistance | 低翹曲<br>耐磨耗<br>Wear<br>resistance                 | 低翹曲<br>Low warp            |
| 1.48                                         | 1.5                                          | 1.26                             | 1.40                                         | 1.50                                         | 1.26                            | 1.16                      | 1.4                                          | 1.16                                             | 1.36                       |
| 160                                          | 145                                          | 110                              | 65                                           | 60                                           | 67                              | 85                        | 180                                          | 100                                              | 80                         |
| 3                                            | 3                                            | 5                                | 5                                            | 4                                            | 10                              | 5                         | 4                                            | 2                                                | 4                          |
| 245                                          | 220                                          | 170                              | 105                                          | 90                                           | 100                             | 115                       | 270                                          | 160                                              | 130                        |
| 8300                                         | 7800                                         | 4900                             | 3000                                         | 3300                                         | 2,650                           | 3,000                     | 9,100                                        | 4,700                                            | 4,000                      |
| 11                                           | 13                                           | 6                                | 3                                            | 4                                            | 3                               | 5                         | 9                                            | 5                                                | 3                          |
| 240                                          | 235                                          | 230                              | 75                                           | 76                                           | 100                             | 100                       | 240                                          | 160                                              | 115                        |
| 10E13                                        | 10E13                                        | 10E13                            | 10E13                                        | 10E13                                        | 10E13                           | 10E13                     | 10E13                                        | 10E13                                            | 10E13                      |
| 10E14                                        | 10E14                                        | 10E14                            | 10E14                                        | 10E14                                        | 10E14                           | 10E14                     | 10E14                                        | 10E14                                            | 10E14                      |
| HB                                           | HB                                           | HB                               | HB                                           | HB                                           | HB                              | HB                        | HB                                           | HB                                               | HB                         |
| 0.2-0.5                                      | 0.2-0.5                                      | 0.3-0.7                          | 1.3-1.7                                      | 1.0-1.3                                      | 1.5-1.8                         | 1.6-2.0                   | 0.2-0.6                                      | 1.3-1.7                                          | 1.0-1.4                    |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。  
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



# PA系列工程塑膠複合材料

The best choice for PA compounds

## ● 尼龍 (PA) (Nylon) 66

| 項目<br>Grade name             | 單位<br>Unit        | ISO<br>測試方法<br>ISO<br>Testing<br>method | 超高強度、強韌性 High Strength impact |                            |                                                 |                                             |                                                           |
|------------------------------|-------------------|-----------------------------------------|-------------------------------|----------------------------|-------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|
|                              |                   |                                         | 2330HS                        | 2133HS                     | 2300HS-FR                                       | 2400AHS                                     | 2600XHS                                                   |
| 特點<br>Characteristics        | —                 | —                                       | PA66<br>33%<br>Glass Fiber    | PA66<br>33%<br>Glass Fiber | PA66<br>30%<br>Glass Fiber                      | PA66<br>40%<br>Glass Fiber                  | PA66<br>60%<br>Glass Fiber                                |
|                              |                   |                                         | 高強度<br>high strength          | 高強度<br>high strength       | 高強度<br>無鹵阻燃<br>high strength<br>Flame retardant | 高強度<br>良表面<br>high strength<br>good surface | 高強度<br>低吸濕<br>High strength<br>Low moisture<br>Absorption |
| 比重<br>Specific gravity       | g/cm <sup>3</sup> | 1183                                    | 1.39                          | 1.39                       | 1.38                                            | 1.47                                        | 1.70                                                      |
| 拉伸強度<br>Tensile strength     | MPa               | 527-1,2                                 | 185                           | 182                        | 150                                             | 215                                         | 265                                                       |
| 拉伸率<br>Tensile elongation    | %                 | 527-1,2                                 | 5                             | 5                          | 2                                               | 4                                           | 3                                                         |
| 彎曲強度<br>Flexural strength    | MPa               | 178                                     | 280                           | 275                        | 240                                             | 310                                         | 390                                                       |
| 彎曲模數<br>Flexural modulus     | MPa               | 178                                     | 9400                          | 9200                       | 9000                                            | 12000                                       | 20000                                                     |
| 衝擊強度 (缺口)<br>Charpy(notched) | kJ/m <sup>2</sup> | 179/1eA                                 | 16                            | 17                         | 12                                              | 16                                          | 14                                                        |
| 熱變形溫度<br>DTUL(1.8Mpa)        | ℃                 | 75-1,2                                  | 240                           | 210                        | 200                                             | 240                                         | 240                                                       |
| 體積阻抗<br>Volume resistivity   | Ω.cm              | IEC<br>60093                            | 10E13                         | 10E13                      | 10E13                                           | 10E13                                       | 10E13                                                     |
| 表面阻抗<br>Surface resistivity  | Ω                 | IEC<br>60093                            | 10E14                         | 10E14                      | 10E14                                           | 10E14                                       | 10E14                                                     |
| 耐燃性<br>Flammability          | —                 | UL 94                                   | HB                            | HB                         | V0                                              | HB                                          | HB                                                        |
| 模收縮<br>Mold shrinkage        | %                 | 50X70X3<br>mmt                          | 0.2-0.6                       | 0.2-0.6                    | 0.2-0.6                                         | 0.2-0.5                                     | 0.1-0.4                                                   |

## ● 尼龍 (PA) (Nylon) 12

|                                       |                                       |                                                           | 玻璃纖維強化 Glass Fiber                                 |                                              |                                                | 碳纖維強化 Carbon Fiber                           |                                              |
|---------------------------------------|---------------------------------------|-----------------------------------------------------------|----------------------------------------------------|----------------------------------------------|------------------------------------------------|----------------------------------------------|----------------------------------------------|
| 2133HST                               | 2400HST                               | 2500XHST                                                  | 3300GF                                             | 3315TF                                       | 3225AF                                         | 3150CF                                       | 3300CF                                       |
| PA66<br>33%<br>Glass Fiber            | PA66<br>40%<br>Glass Fiber            | PA66<br>50%<br>Glass Fiber                                | PA12<br>30%<br>Glass Fiber                         | PA12<br>Glass Fiber<br>PTFE                  | PA12<br>Aramid<br>Fiber<br>Glass Fiber<br>PTFE | PA12<br>15%<br>Carbon Fiber                  | PA12<br>30%<br>Carbon Fiber                  |
| 高強韌<br>高韌性<br>High strength<br>impact | 高強韌<br>高韌性<br>High strength<br>impact | 高強韌<br>低吸濕<br>High strength<br>Low moisture<br>Absorption | 高強度<br>尺寸安定<br>Strength<br>Dimensional<br>Accuracy | 高強度<br>耐磨耗<br>Strength<br>wear<br>resistance | 高強度<br>耐磨耗<br>Strength<br>wear<br>resistance   | 高剛性<br>耐磨耗<br>Strength<br>wear<br>resistance | 高剛性<br>耐磨耗<br>Strength<br>wear<br>resistance |
| 1.37                                  | 1.42                                  | 1.55                                                      | 1.23                                               | 1.30                                         | 1.15                                           | 1.13                                         | 1.15                                         |
| 150                                   | 160                                   | 220                                                       | 105                                                | 90                                           | 75                                             | 115                                          | 160                                          |
| 6                                     | 5                                     | 3                                                         | 5                                                  | 5                                            | 6                                              | 5                                            | 5                                            |
| 230                                   | 235                                   | 330                                                       | 155                                                | 140                                          | 105                                            | 150                                          | 240                                          |
| 7850                                  | 9100                                  | 14000                                                     | 5,000                                              | 5,000                                        | 3,000                                          | 6,000                                        | 12,000                                       |
| 25                                    | 30                                    | 18                                                        | 21                                                 | 19                                           | 16                                             | 16                                           | 22                                           |
| 200                                   | 200                                   | 210                                                       | 160                                                | 155                                          | 100                                            | 145                                          | 160                                          |
| 10E13                                 | 10E13                                 | 10E13                                                     | 10E13                                              | 10E13                                        | 10E13                                          | 10E4                                         | 10E4                                         |
| 10E14                                 | 10E14                                 | 10E14                                                     | 10E14                                              | 10E14                                        | 10E14                                          | 10E5                                         | 10E5                                         |
| HB                                    | HB                                    | HB                                                        | HB                                                 | HB                                           | HB                                             | HB                                           | HB                                           |
| 0.3-0.7                               | 0.3-0.6                               | 0.2-0.5                                                   | 0.3-0.6                                            | 0.2-0.5                                      | 0.7-1.2                                        | 0.3-0.8                                      | 0.2-0.4                                      |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



# PA系列工程塑膠複合材料

The best choice for PA compounds

## ● 尼龍 (PA) (Nylon) 46

| 項目<br>Grade nama                                         | 單位<br>Unit        | ISO<br>測試方法<br>ISO Testing<br>method | 玻璃纖維強化 Glass Fiber         |                            |                                              |                           |
|----------------------------------------------------------|-------------------|--------------------------------------|----------------------------|----------------------------|----------------------------------------------|---------------------------|
|                                                          |                   |                                      | 4300GF                     | 4500GF                     | 4315TF                                       | 4010TF                    |
| 特性<br>Characteristics                                    | —                 | —                                    | PA46<br>30%<br>Glass Fiber | PA46<br>30%<br>Glass Fiber | Glass Fiber<br>PTFE                          | PA46<br>10%<br>PTFE       |
|                                                          |                   |                                      | 高強度<br>high strength       | 高強度<br>high strength       | 高強度<br>耐磨耗<br>Strength<br>wear<br>resistance | 耐磨耗<br>wear<br>resistance |
| 比重<br>Specific gravity                                   | g/cm <sup>3</sup> | 1183                                 | 1.36                       | 1.62                       | 1.4                                          | 1.2                       |
| 拉伸強度<br>Tensile strength                                 | MPa               | 527-1,2                              | 185                        | 225                        | 170                                          | 85                        |
| 拉伸率<br>Tensile elongation                                | %                 | 527-1,2                              | 4                          | 3                          | 2                                            | 10                        |
| 彎曲強度<br>Flexural strength                                | MPa               | 178                                  | 260                        | 330                        | 235                                          | 110                       |
| 彎曲模數<br>Flexural modulus                                 | MPa               | 178                                  | 8,200                      | 13,500                     | 8000                                         | 2,500                     |
| 衝擊強度 (缺口)<br>Charpy impact<br>strength(notched)          | KJ/m <sup>2</sup> | 179 / 1eA                            | 7                          | 13                         | 10                                           | 4                         |
| 熱變形溫度 (1.8MPa)<br>Heat deflection<br>Temperature(1.8MPa) | °C                | 75-1,2                               | 280                        | 280                        | 280                                          | 1800                      |
| 耐燃性<br>Flammability                                      | —                 | UL94                                 | HB                         | HB                         | HB                                           | HB                        |
| 體積阻抗<br>Volume resistivity                               | Ω                 | IEC 60093                            | 10E13                      | 10E13                      | 10E13                                        | 10E13                     |
| 表面阻抗<br>Surface resistivity                              | Ω                 | IEC 60093                            | 10E14                      | 10E14                      | 10E14                                        | 10E14                     |
| 模收縮<br>Mold shrinkage                                    | %                 | 50X70X3<br>mmt                       | 0.5-0.8                    | 0.3-0.7                    | 0.3-0.7                                      | 1.4-2.0                   |

● 尼龍 (PA) (Nylon) 6T

| 耐磨耗 Wear resistance       |                           |                                              |                                 |                                 | 纖維強化 Fiber                                                          |                                                                     |                                                          |
|---------------------------|---------------------------|----------------------------------------------|---------------------------------|---------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------|
| 4015TF                    | 4182TFS                   | 4150CF                                       | 4115CF                          | 4715AF                          | H700GF                                                              | H900GF                                                              | H600CF                                                   |
| PA46<br>15%<br>PTFE       | PA46<br>PTFE<br>Silicone  | PA46<br>15%<br>Carbon Fiber                  | PA46<br>Carbon<br>Fiber<br>PTFE | PA46<br>Aramid<br>Fiber<br>PTFE | PA6T<br>40%<br>Glass Fiber                                          | PA6T<br>45%<br>Glass Fiber                                          | PA6T<br>30%<br>Carbon<br>Fiber                           |
| 耐磨耗<br>wear<br>resistance | 耐磨耗<br>wear<br>resistance | 高剛性<br>耐磨耗<br>Strength<br>wear<br>resistance | 高耐磨耗<br>wear<br>resistance      | 高耐磨耗<br>wear<br>resistance      | 耐高溫<br>高強度<br>High<br>temperature<br>toleration<br>High<br>strength | 耐高溫<br>高強度<br>High<br>temperature<br>toleration<br>High<br>strength | 耐高溫<br>高剛性<br>High<br>strength<br>Electron<br>conductive |
| 1.25                      | 1.26                      | 1.22                                         | 1.26                            | 1.25                            | 1.42                                                                | 1.53                                                                | 1.31                                                     |
| 80                        | 70                        | 200                                          | 75                              | 65                              | 190                                                                 | 210                                                                 | 250                                                      |
| 10                        | 10                        | 2                                            | 6                               | 6                               | 2                                                                   | 3                                                                   | 1                                                        |
| 105                       | 90                        | 270                                          | 110                             | 90                              | 275                                                                 | 300                                                                 | 375                                                      |
| 2,500                     | 2,200                     | 10,100                                       | 3200                            | 2,400                           | 11,000                                                              | 13,100                                                              | 23,000                                                   |
| 4                         | 4                         | 5                                            | 4                               | 4                               | 10                                                                  | 9                                                                   | 7                                                        |
| 180                       | 175                       | 280                                          | 220                             | 190                             | 265                                                                 | 280                                                                 | 280                                                      |
| HB                        | HB                        | HB                                           | HB                              | HB                              | HB                                                                  | HB                                                                  | HB                                                       |
| 10E13                     | 10E13                     | 10E4                                         | 10E12                           | 10E13                           | 10E13                                                               | 10E13                                                               | 10E4                                                     |
| 10E14                     | 10E14                     | 10E5                                         | 10E12                           | 10E14                           | 10E14                                                               | 10E14                                                               | 10E5                                                     |
| 1.2-2.0                   | 1.0-1.8                   | 0.6-1.0                                      | 0.8-1.2                         | 1.5-2.0                         | 0.2-0.8                                                             | 0.6-0.6                                                             | 0.1-0.6                                                  |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



# 高性能特殊尼龍複合材料

The best choice for NYLON compounds

## ● 高性能特殊尼龍複合材料 (低吸濕尼龍系列) – 物性表

| 項目<br>Grade name                                             | 單位<br>Unit        | ISO<br>測試方法<br>ISO<br>Testing<br>method | 低吸濕尼龍 PAMXD6                                                     |                                                                  |                                                                  |                                                                  |                                                     |                                                           |
|--------------------------------------------------------------|-------------------|-----------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|
|                                                              |                   |                                         | X600GF                                                           | X800GT                                                           | XA00GF                                                           | XB00GF                                                           | X550GT                                              | X600CF                                                    |
| 特性<br>Characteristics                                        | –                 | –                                       | 30%<br>Glass<br>Fiber                                            | 40%<br>Glass<br>Fiber                                            | 50%<br>Glass<br>Fiber                                            | 60%<br>Glass<br>Fiber                                            | Mineral<br>Glass<br>Fiber                           | 30%<br>Carbon<br>Fiber                                    |
|                                                              |                   |                                         | 高強度<br>尺寸安定<br>High<br>strength<br>Low<br>moisture<br>absorption | 高強度<br>尺寸安定<br>High<br>strength<br>Low<br>moisture<br>absorption | 高強度<br>尺寸安定<br>High<br>strength<br>Low<br>moisture<br>absorption | 高強度<br>尺寸安定<br>High<br>strength<br>Low<br>moisture<br>absorption | 低翹曲<br>尺寸安定<br>High<br>strength<br>Lower<br>warpage | 高剛性<br>尺寸安定<br>High<br>strength<br>Electron<br>conductive |
| 比重<br>specific gravity                                       | g/cm <sup>3</sup> | 1183                                    | 1.43                                                             | 1.55                                                             | 1.65                                                             | 1.76                                                             | 1.72                                                | 1.35                                                      |
| 拉伸強度<br>Tensile strength                                     | MPa               | 527-1,2                                 | 175                                                              | 210                                                              | 240                                                              | 255                                                              | 180                                                 | 225                                                       |
| 拉伸率<br>Tensile Elongation                                    | %                 | 527-1,2                                 | 2                                                                | 2                                                                | 3                                                                | 2                                                                | 2                                                   | 1                                                         |
| 彎曲強度<br>Flexural strength                                    | MPa               | 178                                     | 250                                                              | 310                                                              | 365                                                              | 390                                                              | 280                                                 | 350                                                       |
| 彎曲模數<br>Flexural modulus                                     | MPa               | 178                                     | 10,500                                                           | 12,000                                                           | 16,200                                                           | 18,000                                                           | 14,500                                              | 23,000                                                    |
| 衝擊強度 (缺口)<br>Charpy impact<br>strength (notched)             | KJ/m <sup>2</sup> | 179/1eA                                 | 6                                                                | 10                                                               | 10                                                               | 10                                                               | 6                                                   | 5                                                         |
| 熱變形溫度 (1.8MPa)<br>Heat Deflection<br>Temperature<br>(1.8mpa) | °C                | 75-1,2                                  | 225                                                              | 230                                                              | 230                                                              | 230                                                              | 230                                                 | 230                                                       |
| 耐燃性<br>Flammability                                          | –                 | UL94                                    | HB                                                               | HB                                                               | HB                                                               | HB                                                               | HB                                                  | HB                                                        |
| 體積阻抗<br>Volume resistivity                                   | Ω                 | IEC<br>60093                            | 10E13                                                            | 10E13                                                            | 10E13                                                            | 10E13                                                            | 10E13                                               | 10E4                                                      |
| 表面阻抗<br>Surface resistivity                                  | Ω                 | IEC<br>60093                            | 10E14                                                            | 10E14                                                            | 10E14                                                            | 10E14                                                            | 10E14                                               | 10E5                                                      |
| 模收縮<br>Mold shrinkage                                        | %                 | 50X70X3<br>mmt                          | 0.2-0.5                                                          | 0.1-0.5                                                          | 0.1-0.4                                                          | 0.1-0.4                                                          | 0.1-0.5                                             | 0.1-0.4                                                   |

|                                                     | 低吸濕尼龍 PA66/PAMXD6                                      |                                                        |                                                        |                                                        | 高導熱尼龍 PA6、PA66                               |                                              |                                              |                                              |
|-----------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|
| X800CF                                              | 2300XGF                                                | 2400XGF                                                | 2500XGF                                                | 2600XGF                                                | 1C00MGT                                      | 1C00MGT-S8                                   | 2C00MGT-S8                                   | 1C00MGT-T8                                   |
| 40% Carbon Fiber                                    | 30% Glass Fiber                                        | 40% Glass Fiber                                        | 50% Glass Fiber                                        | 60% Glass Fiber                                        |                                              | Glass Fiber                                  | Glass Fiber                                  | Carbon Fibe                                  |
| 高剛性<br>尺寸安定<br>High strength<br>Electron conductive | 高剛性<br>低吸濕<br>High strength<br>Low moisture absorption | 高剛性<br>低吸濕<br>High strength<br>Low moisture absorption | 高剛性<br>低吸濕<br>High strength<br>Low moisture absorption | 高剛性<br>低吸濕<br>High strength<br>Low moisture absorption | 導熱係數<br>1-2 W/m K<br>High thermal conductive | 導熱係數<br>2-3 W/m K<br>High thermal conductive | 導熱係數<br>2-3 W/m K<br>High thermal conductive | 導熱係數<br>4-5 W/m K<br>High thermal conductive |
| 1.41                                                | 1.38                                                   | 1.50                                                   | 1.58                                                   | 1.70                                                   | 1.55                                         | 1.53                                         | 1.54                                         | 1.60                                         |
| 250                                                 | 175                                                    | 220                                                    | 240                                                    | 255                                                    | 52                                           | 110                                          | 112                                          | 80                                           |
| 1                                                   | 2                                                      | 2                                                      | 3                                                      | 2                                                      | 2                                            | 2                                            | 2                                            | 1                                            |
| 380                                                 | 275                                                    | 320                                                    | 360                                                    | 400                                                    | 85                                           | 140                                          | 142                                          | 110                                          |
| 26,000                                              | 9,500                                                  | 12,000                                                 | 15,200                                                 | 18,000                                                 | 8000                                         | 12500                                        | 13000                                        | 14500                                        |
| 7                                                   | 10                                                     | 10                                                     | 11                                                     | 13                                                     | 2                                            | 6                                            | 5                                            | 4                                            |
| 230                                                 | 230                                                    | 230                                                    | 230                                                    | 240                                                    | 90                                           | 170                                          | 175                                          | 150                                          |
| HB                                                  | HB                                                     | HB                                                     | HB                                                     | HB                                                     | HB                                           | V0                                           | V0                                           | V0                                           |
| 10E4                                                | 10E13                                                  | 10E13                                                  | 10E13                                                  | 10E13                                                  | 10E7                                         | 10E5                                         | 10E5                                         | 10E4                                         |
| 10E5                                                | 10E14                                                  | 10E14                                                  | 10E14                                                  | 10E14                                                  | 10E8                                         | 10E6                                         | 10E6                                         | 10E5                                         |
| 0.1-0.4                                             | 0.2-0.5                                                | 0.1-0.5                                                | 0.1-0.4                                                | 0.1-0.4                                                | 0.7-1.1                                      | 0.3-0.7                                      | 0.3-0.7                                      | 0.4-0.8                                      |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



## 高性能特殊尼龍複合材料

The best choice for NYLON compounds

### ● 高階特殊複合材料及其他工程塑膠

| 項目<br>Grade name                                       | 單位<br>Unit        | ISO<br>測試方法 | PEEK                                                        |                                               |                                  | PEI                     |                         |                                             |                                             |
|--------------------------------------------------------|-------------------|-------------|-------------------------------------------------------------|-----------------------------------------------|----------------------------------|-------------------------|-------------------------|---------------------------------------------|---------------------------------------------|
|                                                        |                   |             | K100NC                                                      | K300CF                                        | K220KG                           | 9400GF                  | 9600GF                  | 9200CF                                      | 9400CF                                      |
| 特性<br>Characteristics                                  | —                 | —           | Carbon nanotube                                             | 15% Carbon Fiber                              | Whisker                          | 20% Glass Fiber         | 30% Glass Fiber         | 10% Carbon Fiber                            | 20% Carbon Fiber                            |
|                                                        |                   |             | 抗靜電<br>潔淨度<br>high<br>cleanness<br>permanent<br>anti-static | 高剛性<br>耐磨導電<br>high<br>strength<br>conductive | 高剛性<br>耐磨耗<br>wear<br>resistance | 高強度<br>high<br>strength | 高強度<br>high<br>strength | 高剛性<br>導電<br>high<br>strength<br>conductive | 高剛性<br>導電<br>high<br>strength<br>conductive |
| 比重<br>specific gravity                                 | g/cm <sup>3</sup> | 1183        | 1.32                                                        | 1.36                                          | 1.45                             | 1.41                    | 1.5                     | 1.3                                         | 1.35                                        |
| 拉伸強度<br>Tensile strength                               | MPa               | 527-1,2     | 100                                                         | 200                                           | 85                               | 148                     | 165                     | 150                                         | 170                                         |
| 拉伸率<br>Tensile Elongation                              | %                 | 527-1,2     | 4                                                           | 2                                             | 5                                | 3                       | 2                       | 1                                           | 2                                           |
| 彎曲強度<br>Flexural strength                              | MPa               | 178         | 160                                                         | 295                                           | 136                              | 210                     | 230                     | 210                                         | 215                                         |
| 彎曲模數<br>Flexural modulus                               | MPa               | 178         | 4100                                                        | 13000                                         | 4100                             | 8,500                   | 11,000                  | 8,500                                       | 12,000                                      |
| 衝擊強度 (缺口)<br>Charpy impact strength (notched)          | KJ/m <sup>2</sup> | 179/1eA     | 3                                                           | 6                                             | 7                                | 7                       | 10                      | 4                                           | 4                                           |
| 熱變形溫度 (1.8MPa)<br>Heat Deflection Temperature (1.8mpa) | ℃                 | 75-1,2      | 155                                                         | 310                                           | 170                              | 208                     | 208                     | 210                                         | 210                                         |
| 體積阻抗<br>Volume resistivity                             | Ω                 | IEC 60093   | 10E4                                                        | 10E4                                          | 10E13                            | 10E14                   | 10E14                   | 10E5                                        | 10E4                                        |
| 表面阻抗<br>Surface resistivity                            | Ω                 | IEC 60093   | 10E5                                                        | 10E5                                          | 10E14                            | 10E14                   | 10E14                   | 10E5                                        | 10E5                                        |
| 耐燃性<br>Flammability                                    | —                 | UL 94       | V0                                                          | V0                                            | V0                               | V0                      | V0                      | V0                                          | V0                                          |
| 模收縮<br>Mold shrinkage                                  | %                 | 50×70×3 mmt | 1.4-1.8                                                     | 0.3-0.7                                       | 1.3-1.6                          | 0.2-0.4                 | 0.1-0.3                 | 0.2-0.4                                     | 0.1-0.3                                     |

|                                          |                                                       | PPS                                      |                                          |                               | PC                   |                      |                      |                                    |                                          |                                          |
|------------------------------------------|-------------------------------------------------------|------------------------------------------|------------------------------------------|-------------------------------|----------------------|----------------------|----------------------|------------------------------------|------------------------------------------|------------------------------------------|
| 9600CF                                   | 9400NC                                                | 7400CF                                   | 7600CF                                   | 7220TF                        | 5100GF               | 5200GF               | 5300GF               | 5100CF                             | 5150CF                                   | 5200CF                                   |
| 30% Carbon Fiber                         | Carbon nanotube                                       | 20% Carbon Fiber                         | 30% Carbon Fiber                         | PTFE Glass Fiber              | 10% Glass Fiber      | 20% Glass Fiber      | 30% Glass Fiber      | 10% Carbon Fiber                   | 15% Carbon Fiber                         | 20% Carbon Fiber                         |
| 高剛性<br>導電<br>high strength<br>conductive | 抗靜電<br>潔淨度<br>high cleanness<br>permanent anti-static | 高剛性<br>導電<br>high strength<br>conductive | 高剛性<br>導電<br>high strength<br>conductive | 高強度<br>耐磨耗<br>wear resistance | 高強度<br>high strength | 高強度<br>high strength | 高強度<br>high strength | 高剛性<br>high strength<br>conductive | 高剛性<br>導電<br>high strength<br>conductive | 高剛性<br>導電<br>high strength<br>conductive |
| 1.39                                     | 1.27                                                  | 1.4                                      | 1.45                                     | 1.48                          | 1.27                 | 1.33                 | 1.43                 | 1.24                               | 1.26                                     | 1.28                                     |
| 180                                      | 120                                                   | 175                                      | 190                                      | 78                            | 80                   | 110                  | 125                  | 125                                | 145                                      | 150                                      |
| 1                                        | 9                                                     | 1                                        | 1                                        | 1                             | 6                    | 4                    | 3                    | 3                                  | 3                                        | 2                                        |
| 240                                      | 165                                                   | 242                                      | 180                                      | 125                           | 138                  | 170                  | 200                  | 170                                | 190                                      | 200                                      |
| 15000                                    | 3600                                                  | 15,000                                   | 20,000                                   | 6,200                         | 3800                 | 5600                 | 7500                 | 7000                               | 9800                                     | 11000                                    |
| 5                                        | 3                                                     | 5                                        | 5                                        | 4                             | 6                    | 13                   | 14                   | 9                                  | 10                                       | 10                                       |
| 210                                      | 200                                                   | 260                                      | 265                                      | 230                           | 135                  | 140                  | 140                  | 135                                | 140                                      | 140                                      |
| 10E4                                     | 10E7                                                  | 10E4                                     | 10E4                                     | 10E14                         | 10E14                | 10E14                | 10E14                | 10E5                               | 10E4                                     | 10E4                                     |
| 10E4                                     | 10E8                                                  | 10E5                                     | 10E4                                     | 10E15                         | 10E14                | 10E14                | 10E14                | 10E6                               | 10E5                                     | 10E5                                     |
| V0                                       | V0                                                    | V0                                       | V0                                       | V0                            | HB                   | HB                   | HB                   | HB                                 | HB                                       | HB                                       |
| 0.1-0.3                                  | 0.4-0.8                                               | 0.1-0.3                                  | 0.1-0.3                                  | 0.2-0.4                       | 0.5-0.8              | 0.3-0.6              | 0.1-0.4              | 0.2-0.5                            | 0.1-0.4                                  | 0.1-0.4                                  |

1. 以上數值為材料的代表性測試值、並非該規格材料的最低值。
2. 有關本公司材料的安全使用，請參考所用材料、品級相對應的製品安全數據表 [MSDS]。



## 泛用塑膠及其它特殊複合材料

The best choice for other compounds

### ● PC / ABS / PMMA / PP ○

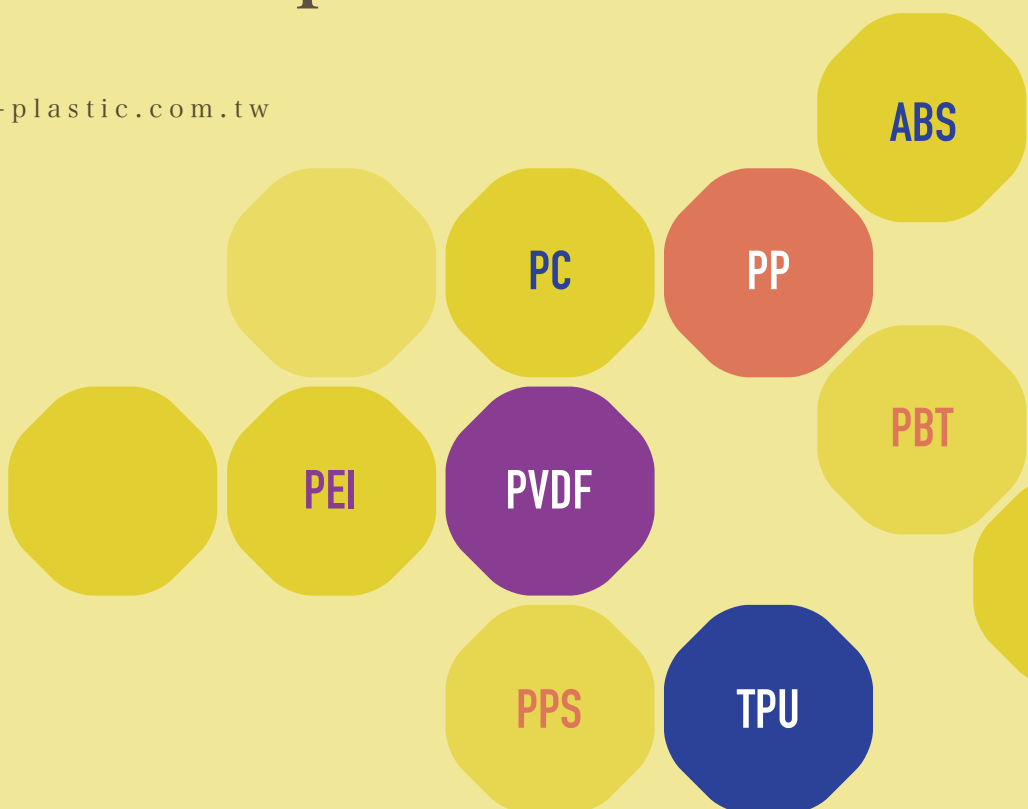
| 項目<br>Grade name                                             | 單位<br>Unit        | ISO<br>測試方法    | PC                        |                                                      |                                                             |                                          |                                              |                                          |                                                        |
|--------------------------------------------------------------|-------------------|----------------|---------------------------|------------------------------------------------------|-------------------------------------------------------------|------------------------------------------|----------------------------------------------|------------------------------------------|--------------------------------------------------------|
|                                                              |                   |                | 5100TFS                   | 5150TF                                               | 5100NC                                                      | 5030AS                                   | A116ST                                       | A030AS                                   | A200AS                                                 |
| 特性<br>Characteristics                                        | —                 | —              | PTFE<br>Silicon           | Glass Fiber<br>PTFE                                  | Carbon<br>nanotube                                          |                                          | ABS/PA                                       |                                          |                                                        |
|                                                              |                   |                | 耐磨耗<br>wear<br>resistance | 高強度<br>耐磨耗<br>high<br>strength<br>wear<br>resistance | 抗靜電<br>潔淨度<br>high<br>cleanness<br>permanent<br>anti-static | 永久抗靜電<br>可染色<br>Permanent<br>anti-static | 耐衝擊<br>易塗層<br>High impact<br>good<br>surface | 永久抗靜電<br>可染色<br>Permanent<br>anti-static | 透明<br>永久抗靜電<br>Transparent<br>Permanent<br>anti-static |
| 比重<br>specific gravity                                       | g/cm <sup>3</sup> | 1183           | 1.22                      | 1.42                                                 | 1.2                                                         | 1.2                                      | 1.07                                         | 1.06                                     | 1.06                                                   |
| 拉伸強度<br>Tensile strength                                     | MPa               | 527-1,2        | 58                        | 75                                                   | 62                                                          | 50                                       | 35                                           | 45                                       | 37                                                     |
| 拉伸率<br>Tensile Elongation                                    | %                 | 527-1,2        | 20                        | 3                                                    | 30                                                          | 30                                       | 100                                          | 25                                       | 20                                                     |
| 彎曲強度<br>Flexural strength                                    | MPa               | 178            | 85                        | 120                                                  | 95                                                          | 70                                       | 45                                           | 65                                       | 50                                                     |
| 彎曲模數<br>Flexural modulus                                     | MPa               | 178            | 2100                      | 4300                                                 | 2500                                                        | 2000                                     | 1100                                         | 2200                                     | 2100                                                   |
| 衝擊強度 (缺口)<br>Charpy impact<br>strength (notched)             | KJ/m <sup>2</sup> | 179/1eA        | 11                        | 12                                                   | 30                                                          | 19                                       | 60                                           | 15                                       | 12                                                     |
| 熱變形溫度 (1.8MPa)<br>Heat Deflection<br>Temperature<br>(1.8mpa) | ℃                 | 75-1,2         | 120                       | 125                                                  | 120                                                         | 90                                       | 67                                           | 80                                       | 80                                                     |
| 體積阻抗<br>Volume resistivity                                   | Ω                 | IEC<br>60093   | 10E14                     | 10E14                                                | 10E5                                                        | 10E10                                    | 10E14                                        | 10E10                                    | 10E9                                                   |
| 表面阻抗<br>Surface resistivity                                  | Ω                 | IEC<br>60093   | 10E14                     | 10E14                                                | 10E5                                                        | 10E10                                    | 10E14                                        | 10E10                                    | 10E10                                                  |
| 耐燃性<br>Flammability                                          | —                 | UL 94          | HB                        | HB                                                   | HB                                                          | HB                                       | HB                                           | HB                                       | HB                                                     |
| 模收縮<br>Mold shrinkage                                        | %                 | 50×70×3<br>mmt | 0.8-1.1                   | 0.6-0.9                                              | 0.7-1.0                                                     | 0.9-1.2                                  | 0.6-1.0                                      | 0.6-1.0                                  | 0.6-1.0                                                |

| ABS                  |                      |                                    |                                          | PMMA                                                    | PP                   |                      |                      |                                    |                                          |                                          |
|----------------------|----------------------|------------------------------------|------------------------------------------|---------------------------------------------------------|----------------------|----------------------|----------------------|------------------------------------|------------------------------------------|------------------------------------------|
| A400GF               | A600GF               | A200CF                             | A400CF                                   | P600AS                                                  | 6600GF               | 6800GF               | 6A00GF               | 6200CF                             | 6300CF                                   | 6400CF                                   |
| 20% Glass Fiber      | 30% Glass Fiber      | 10% Carbon Fiber                   | 20% Carbon Fiber                         |                                                         | 30% Glass Fiber      | 40% Glass Fiber      | 50% Glass Fiber      | 10% Carbon Fiber                   | 15% Carbon Fiber                         | 20% Carbon Fiber                         |
| 高強度<br>high strength | 高強度<br>high strength | 高剛性<br>high strength<br>conductive | 高剛性<br>導電<br>high strength<br>conductive | 高透明<br>永久抗靜電<br>Transparent<br>Permanent<br>anti-static | 高強度<br>high strength | 高強度<br>high strength | 高強度<br>high strength | 高剛性<br>high strength<br>conductive | 高剛性<br>導電<br>high strength<br>conductive | 高剛性<br>導電<br>high strength<br>conductive |
| 1.19                 | 1.26                 | 1.09                               | 1.13                                     | 1.14                                                    | 1.12                 | 1.21                 | 1.33                 | 0.98                               | 1.04                                     | 1.06                                     |
| 75                   | 90                   | 95                                 | 115                                      | 48                                                      | 85                   | 100                  | 115                  | 60                                 | 70                                       | 75                                       |
| 2                    | 2                    | 2                                  | 1                                        | 5                                                       | 5                    | 2                    | 2                    | 2                                  | 2                                        | 2                                        |
| 115                  | 130                  | 125                                | 158                                      | 65                                                      | 120                  | 140                  | 175                  | 70                                 | 75                                       | 80                                       |
| 5500                 | 7400                 | 7200                               | 11000                                    | 1850                                                    | 5100                 | 6900                 | 9500                 | 3800                               | 4800                                     | 5000                                     |
| 7                    | 6                    | 6                                  | 7                                        | 2                                                       | 10                   | 10                   | 14                   | 5                                  | 4                                        | 4                                        |
| 95                   | 100                  | 98                                 | 98                                       | 80                                                      | 140                  | 150                  | 150                  | 120                                | 128                                      | 135                                      |
| 10E14                | 10E14                | 10E4                               | 10E4                                     | 10E8                                                    | 10E14                | 10E14                | 10E14                | 10E5                               | 10E4                                     | 10E4                                     |
| 10E14                | 10E14                | 10E5                               | 10E4                                     | 10E9                                                    | 10E14                | 10E14                | 10E14                | 10E5                               | 10E5                                     | 10E5                                     |
| HB                   | HB                   | HB                                 | HB                                       | HB                                                      | HB                   | HB                   | HB                   | HB                                 | HB                                       | HB                                       |
| 0.2-0.4              | 0.1-0.3              | 0.2-0.4                            | 0.1-0.3                                  | 0.8-1.3                                                 | 0.3-0.6              | 0.2-0.5              | 0.1-0.4              | 0.6-0.9                            | 0.5-0.8                                  | 0.4-0.7                                  |

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# Special Engineering Plastic Compounds

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