



## ANWIN TECHNOLOGY CO., LTD.

11-4FL., No. 171, Sec.4, Nan King East Road, Taipei, 105, Taiwan. R.O.C

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: [Marketing@awint.com](mailto:Marketing@awint.com)

### Glass Fiber Reinforcements

#### Conventional Roving

##### Features :

- Excellent dispersion helps eliminate clumping.
- Fast wet-out and wet-through to ensure reduced resin usage and shorter work time.
- Low fuzz and fly to assure cleaner operations.
- Low static insures maximum gun operator comfort and safety.
- Smooth run-out, package-to-package, minimize interruptions.
- Powerful strand chemistry allows use of same roving in both filled and unfilled resin systems.
- Minimum force to cut strands adds to cot and blade life.

##### Fields of Applications :

- Transportation
- Aerospace
- Eletronic appliances
- Marine
- Housing and construction
- Industrial and public facilites
- Sports and Recreation



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### Products and Applications :

Product	Characteristics	Resin System	Examples of End-Product Application
992	Excellent transparency	Polyester	Corrugated sheets, Gypsum boards, Pipelines
357B	Standard Spec. for spray-up process		Bathtubs, Plastic chairs, Truck bumpers, Bus exteriors
357M/357H	For high reactive resin system in spray-up process		
433	Structural applications	Polyester / Vinylester	Waffle slabs, Hoods, Bathtubs, Recreational vehicle housings, Automotive exterior body panels
905B	Semi-structural applications		
973C	Class A surface applications		

### Significant Physical Properties :

Product	Filament Diameter (μm)	TEX (Nom ±Variation) (g/1000m)	Solids (Nom ± Variation) (%)	Moisture Content (% max)	Split*1	Weight (Nominal) (kg/roll)
992	11	2400±240	0.70 ± 0.14	0.08	66 ± 12	17 / 18
357B		2300±230	1.10 ± 0.15	0.05	35 +4/-6	18.2/20
357M		2400±240			35 +4/-6	
357H		3460±340			54 +6/-12	
433	13	2400 ± 240	1.80 ± 0.25	0.08	32 +4/-7	17
905B		4400 ± 440	1.10 ± 0.15		56 +8/-12	16/17.8
973C			1.85 ± 0.35			16

\*1Split: Number of roving ends.



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### Packaging & Palletizing :

Product	Rovings per package*1 (L x W x Layer)	Package dimension*2 ( L x W x H (mm))	Remark
Panel Roving	48 (4 x 4 x 3)	1140 x 1140 x 960	
Gun Roving	36 (4 x 3 x 3)	1240 x 930 x 990	
	48 (4 x 3 x 4)	1240 x 930 x 1240	For export
	48 (4 x 4 x 3)	1140 x 1140 x 960	
SMC Roving	36 (4 x 3 x 3)	1240 x 930 x 990	
	48 (4 x 3 x 4)	1240 x 930 x 1240	
	48 (4 x 4 x 3)	1140 x 1140 x 960	
	64 (4 x 4 x 4)	1140 x 1140 x 1220	For export

\*1 Each roving is protected by shrink-wrap PVC bag.

\*2 Package dimension contains pallet stature.



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## **Glass Fiber Reinforcements**

### **Direct Roving**

Feature :

- Excellent processing and handling characteristics.
- The silane sizing is specifically designed for fast wet-out.
- Packages are designed to provide smooth runout.
- Excellent adhesion with resins.

### **General Applications**

Applications include transportation, aerospace, electronic appliances, marine, housing and construction, industrial/public facilities, sports/recreation, etc.

- All diameters and specifications of pipes for water, oil, chemicals, etc.,
- Gratings, rods, poles, cooling/water towers, corrosion-resistant tanks, high-pressure containers.
- Be woven into fabrics for boats, wind turbines, etc.



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### Products and Applications :

Product	Characteristic	Resin System	Examples of End-Product Application
346	Designed for epoxy resin system used in filament winding process	Epoxy	Oil field pipes, Chemical pipes
351 / 352*1	Fast wet out, great applicability in weaving and filament winding processes	U.P. / V.E. / Epoxy	Tool hafts, Tanks, Arrows, Umbrella structure parts
366	Standard Spec. for pultrusion process		
487	High Tex product for pultrusion process	U.P. / V.E. / Epoxy	Structural parts
442	Long Fiber Thermoplastic (LFT)	PP	Auto-parts
474		PA	
634		PC	

\*1 351 roving is softer than 352 roving

### Significant Physical Properties :

Product*1		Nominal Filament Diameter ( $\mu\text{m}$ )	TEX (Nom $\pm$ Variation) (g/1000m)	Solids (Nom $\pm$ Variation)(%)	Moisture Content (% max)	Weight (Nominal) (kg/roll)
346	1100	16	1100 $\pm$ 110	0.55 $\pm$ 0.15	< 0.06	20
	2300	17	2300 $\pm$ 230	0.60 $\pm$ 0.15		



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**Significant Physical Properties :**

Product*1		Nominal Filament Diameter (μm)	TEX (Nom ±Variation) (g/1000m)	Solids (Nom ± Variation)(%)	Moisture Content (% max)	Weight (Nominal) (kg/roll)
<b>351/352</b>	275	13	275± 14	0.65 ± 0.20	<0.06	17
	400	16	400±20			
	600	13	600±30			
	735	13/15	735±70	0.55 ± 0.15		18
	1200	17	1200±120			
	2400		2400±240			
<b>366</b>	600	13	600±30	0.42± 0.10	<0.06	18
	735	13/15	735±70			
	1200	17	1200±120			
	2200	16	2200±200	0.5± 0.12		20
	4400	23	4400±440	0.60 ± 0.15		18
<b>487</b>	8800	33	8800±880	0.7± 0.15	18	
<b>442</b>	1200	17	1200±120	0.8± 0.20	<0.06	20
	2400		2400±240			
<b>474</b>	1200	17	1200±120	0.5± 0.15	<0.06	20
	2400		2400±240			
<b>463</b>	1200	17	1200±120	0.5± 0.15	<0.06	20
	2400		2400±120			

\*1 Production range from 200 tex to 9600 tex upon request



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**Packaging & Palletizing :**

<b>Product</b>	<b>Rovings per package*1 (L x W x Layer)</b>	<b>Package dimension*2 L x W x H (mm)</b>	<b>Remark</b>
<b>Export</b>	48 (4 x 4 x 3)	1240 x 1140x 965	*1 Each roving is protected by shrink-wrap PVC bag.
	64 (4 x 4 x 4)	1140 x 1140 x 1225	*2 Package dimension contains pallet stature.



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### Glass Fiber Reinforcements

#### Woven Roving

##### Features

- Fast Wet-out
- High content of fiberglass. Excellent tensile strength and impact resistance property
- Easy handling, cutting and processing
- Excellent bonding strength among laminates
- Higher dimensional property, regular distribution of fiberglass content

##### Products and Applications :

Product	Characteristic	Resin System	Examples of End-Product Application
WR-570	Fast wet out, excellent operating Applicability and laminate mechanical properties	UP/VE	Exterior of automobile and marine vehicle, Tanks, Architectural structures
WR-600			
WR-800			



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### Typical Physical Properties

Product	Basic Weight (Nom.±Variation) (g/m <sup>2</sup> )	L.O.I (Nom.±Variation) (%)	Moisture Content (%)	Construction(ends/inch)		Width (Nom.±Variation) (mm)
				Warp	Weft	
WR-570	570±55	0.48±0.13	< 0.05	6	6	< 300±6.0
WR-600	600±60			7	6	> 300±9.0
WR-800	800±80	0.61±0.13		5	4	

### Typical Physical Properties

Product	203mm width		1000mm width		1120mm width	
	Length	Weight	Length	Weight	Length	Weight
WR-570	--	--	50	30	--	--
WR-600	65	9.1	65	42	--	--
WR-800	45	8.4	50	42	45	42

### Packaging & Palletizing :

Width(mm)	Rolls/Pallets * 1	Carton dimension(L×W×H(mm))	Remark
1000	16	230 x 230 x 1070	For export. Each WR is packed in protective PE bag within a carton
1120	16/20		



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### **Glass Fiber Reinforcements**

#### **Chopped Strand**

Chopped Strand is made by chopping continuous strands into certain lengths ranging from 3.2mm to 25.4mm. It can be used as reinforcement for thermoplastic and thermosetting plastics. Each plastic has its compatible chopped strand with specific sizing.

#### **Features**

- In-line cutter and off-line cutter create adequate choices of products for end users
- Have good characters of integrity, dispersion and wet-out
- Excellent flowing and compounding rate
- High mechanical propertie



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### Products and Applications :

Product	Characteristic	Resin System	Examples of End-Product Application
<b>473/473P/473H/473HP</b>	Compatible with most nylon	PA6/PA66/PA46	Plastic chairs, Motorcycle cases, rollers skate wheels
<b>173H/173K</b>	Hydrolysis resistance		Radiator grilles, thermal insulation
<b>492</b>	Used with nylon & PET	PA/PET	Containers, Electrical components
<b>183E</b>	Most suitable for PBT resin system	PBT/PET	Electrical switches, Computer fans, PET bottles, connectors, Headlight cases
<b>202P</b>	Coupled and uncoupled PP	PP	Bumpers, Pump cases, Headlight cases
<b>483</b>	ABS application	ABS	Electrical components
<b>183F</b>			
<b>301P</b>	POM application	POM	Gears, Electrical components, Office equipments.
<b>473A</b>	Designed for polycarbonate	PC	Cell phone cases, TFT-LCDs and Digital video cases
<b>475</b>	High temperature resin system	LCP/PPS/PS/PVC	Cell phone cases, Mother board connectors
<b>101C</b>	Designed for a wide variety of BMC	UP/Phenolic/Epoxy	Building construction materials. Transformers, Decorations
<b>405/405D</b>	Phenolic fraction application	UP/Phenolic	Break pads, Decorations



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**Significant Physical Properties :**

Product	Chopped Length (mm)* 1	Nominal Filament Diameter(μm)* 2	Strand Solid (Nom.±Variation) (%)	Strand Integrity (% max) (shake time)	Moisture Content (% max)	Long Fiber (% max.)* 3
473/473P	3.2/4.8	13	0.70±0.20	5(4min)	0.06	1.99
473H/473HP		11	0.86±0.20	5(4min)	0.06	
173H/173K		11/13	0.75±0.15	10(3min)	0.05	
202P		13	0.80±0.20	10(7min)	0.05	
183E		13	0.70±0.15	20(7min)	0.06	
301P		10.5	0.90±0.20	20(7min)	0.06	
473A		13	0.63±0.20	5(3min)	0.06	
483		13	0.70±0.15	10(3min)	0.05	
183F		11/13	0.70±0.15	20(7min)	0.06	
405D		13	1.00±0.20	5(3min)	0.06	
475		13	0.55±0.15	20(3min)	0.06	
101C	3.2/4.8/ 6.4/12.7	10/13	0.80±0.20	5(4min)	0.06	
405		13	1.85±0.25	5(4min)	0.05	
402		10	1.10±0.16	10(4min)	0.06	

\*1 Chopped Length tolerance:3.2/4.8mm:±/ 2mm;12.7mm: ±/3mm.

\*2 Filament Diameter tolerance: ±/ 1.4 micron for all products,

\*3 COA is available upon request.



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### Packaging & Palletizing :

Length(mm)	Weight(kg)*1	Package type	Tolerance of weight (kg)	Bags per pallet	Package dimension L×W×H(mm)*2
All length Spec.	20	Paper bag	-0/+0.1	50	1140×1140×1300
	500	Bulk bag	-0/+2.0	1	1140×1140×1020
	750		1140×1140×1250		
	1000		1140×1140×1170		
	1200		1140×1140×1520		
			-0/+3.0		

\*1 Different quantities are available upon request

\*2 Package dimension contains pallet stature.



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## **Glass Fiber Reinforcements**

### **Chopped Strand Mat**

Chopped strand mat is made of randomly yet evenly distributed strands(filament dia 12 $\mu$ m) chopped into 50mm length.

(a)E-type Chopped Strand Mat, strands are bonded with emulsion binder.

(b)P-type Chopped Strand Mat, stands are bonded with highly soluble polyester powder.

#### **Features**

- Random-directional property.High affinity to thicker laminates at lower cost
- Unified directional character of the mechanical property form the laminates
- Higher content of resin.Better impregnation.
- Excellent bonding effect amount laminates
- Mats of non-continuous chopped strands have smaller damaged area of laminates upon impact.
- Better finishing surface processing of the laminates
- E-type: excellent surface bonding efficiency.working environment can be improved to low pollution and better operation conditions for working people,
- P-type: the laminates have better transparency.



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### Typical Physical Properties

Product	Basic Weight*1(g/m <sup>2</sup> ) (Nom.±Variation)	L.O.I(%) (Nom.±Variation)	Tensile(Ind) (kgf min) (270mm×150mm)	Moisture Content (%)
230P	230±46	6.0±2.0	> 5.0	< 0.2
270P	270±54	5.0±2.0		
300P	300±60	4.5±1.8		
450P	450±90	3.0±1.2	> 7.0	
600P	600±120			
230E	230±46	5.5±2.0	> 5.0	
270E	270±54	5.3±1.2	> 8.0	
300E	300±60	4.9±1.2		
450E	450±90	4.5±1.2	> 10.0	
600E	600±120	4.0±1.2		

\*1 Product range: basic weight 220g/m<sup>2</sup>-900 g/m<sup>2</sup>; width200mm-2600mm.

Product	1040mm width		1210 mm width		1860mm width	
	Length(m)	Weight(kg)	Length(m)	Weight(kg)	Length(m)	Weight(kg)
230P/E	125	30	144	40	117	50
270P/E	107		122		100	
300P/E	96		110		90	
450P/E	64		73		60	
600P/E	48		55		45	



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### Products and Applications :

Product	Characteristics	Resin System	Examples of End-Product Application
<b>Powder type</b>	Fast wet out,great performance in Laminate transparency	U.P/VER	Exterior of automobile and marine vehicle, Tanks,Corrugated sheet
<b>Emulsion type*1</b>	Lower spreading out of glassfiber strands in the operating environment		

\*1 Emulsion bonded mat includes hard type,middle type and soft type.

### Packaging & Palletizing :

Width(mm)	Carton/Pallets * 1	Carton dimension L×W×H(mm)	Package dimension*2 L×W×H(mm)
<b>1040</b>	12	1100×275×275	1140×1140×945
	16		1140×1140×1220
<b>1210</b>	12	1260×315×315	1290×970×1410
	16		1290×970×2060
<b>1860</b>	12	1950×275×275	1950×1140×950
	16		1140×1140×2100

\*1 Each mat is packaged in protective PE bag within a carton

\*2 Package dimension contains pallet stature

### Storage Conditions

- Store in a cool dry area.Suitable temperature: 21±11℃,R.H:60±20%.(temperature should not excess 35℃ and RH should be keep below 75% is also recommended).
- It is recommended to bring material in the working place 24 hours at least prior to use.
- Dont stack higher than two pallets.