



Customer Acceptance Standard

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Supersedes: 13-May-10
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FIBERGLASS CONTINUOUS FILAMENT YARN FOR THE ELECTRICAL INDUSTRY

I. DESCRIPTION

Fiberglass yarn is a natural, lustrous, white, continuous filament yarn, which is twisted on various supply packages. The yarns are smooth, non-cellular and generally cylindrical in form. The yarns are made of glass of high stability and durability and are with the exception of sizing ingredients, inorganic, incombustible and will neither expand nor contract with moisture changes. The glass composition meets the certification for "E" glass as defined by ASTM's D 578-00 Standards Specification for Glass Fiber Strands. The individual glass fibers do not tend to absorb moisture and are extremely flexible.

The sizing may be burned off the yarn under certain conditions. Weathering tests have indicated comparatively unlimited stability under repeated cycles of heat, cold, sunlight, dampness and drying.

II. USE

These yarns are used for further fabrication, plying, winding, braiding, heat cleaning, heat treating, coating and impregnating of sleeving and tubings and banding tapes.

OR

For braiding and serving on wire and cable and magnet wire and other miscellaneous electrical applications.



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III. YARN NOMENCLATURE

ECG150 1/0 1.0Z

E- Electrical glass formulation
 C- Continuous filaments
 G- Filament diameter (See Table 1)
 150- Yards per pound divided by 100
 1/0- Single yarn end
 1.0Z- One turn per inch (TPI)

EC9-33 1X0 Z40

E- Electrical glass formulation
 C- Continuous filaments
 9- Filament diameter (See Table 1)
 33- grams per 1000 meters of yarn
 1X0- Single yarn end
 Z40- Twists per meter (TPM)

Throughout history, the actual yardage or tex of yarn products has often been shifted from the actual yield provided in the product name. Therefore, the yarn name is only used as a descriptor. The table in section V. must be utilized to obtain the actual bare glass yield of a yarn product.

IV. GENERAL INFORMATION

Filament Designation	Filament Designation	Range for Average Filament Diameter			
		Minimum Inches	Maximum Inches	Minimum μm	Maximum μm
G	9.0	0.00035	0.000399	8.89	10.15
H	11	0.00040	0.000449	10.16	11.42

The yarns are twisted onto plastic single flange bobbins with a milk bottle type build, which is suitable for over-top delivery. The bobbins are designed to provide a smooth runout, and their geometry is controlled to maintain the desired runout performance. The package build will not extend past the edge of the base. Maximum allowable undercut at the base is 3/16" (5mm). The bobbins have no defects on the nose, which would interfere with the smooth removal of the yarn.

Packages 9225 and 9228 are designed for twisting and plying operations where the yarn is removed over the side of the package on standard twist and ply equipment



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V. AVAILABLE PRODUCTS AND BARE GLASS PROPERTIES

Product Name*	Product Name (SI) *	Sizing	Bare Glass Yield						Typical Cv**
			Nominal Yds/ lb	Minimum Yds/ lb	Maximum Yds/ lb	Nominal Tex	Maximum Tex	Minimum Tex	
ECG150 1/0 4.0Z	EC9 33 1X0 Z160	620	15000	14000	16000	33.1	35.4	31.0	2.5
ECG75 1/0 4.0Z	EC9 68 1X0 Z160	620	7300	6618	7982	68.0	75.0	62.1	3.1
ECG75 1/ 2 2.8S	EC9 68 1X2 S112	620	3650	3309	3991	135.9	149.1	124.3	3.1
ECG50 1/0 0.7Z	EC9 99 1X0 Z28	620	5000	4725	5275	99.2	105.0	94.0	1.8
ECG50 1/0 4.0Z	EC9 99 1X0 Z160	620	5000	4725	5275	99.2	105.0	94.0	1.8
ECG37 1/ 2 2.8S	EC9 134 1X2 S112	620	1233	1142	1324	268.1	288.7	249.8	2.5
ECG37 1/3 3.8S	EC9 134 1X3 S152	620	1233	1142	1324	402.3	434.4	374.7	2.5
ECG37 1/0 4.0z	EC9 134 1x0 z160	620	3700	3354	4046	134	147.9	122.6	2.5

* Nomenclature used for identification purposes only. Nomenclature may not indicate true yield.

** Cv provided as a reference only. This is not a specified product property.

Additional Comments:

1. See Section VIII for bobbin selections.

VI. AVAILABLE PRODUCTS AND ADDITIONAL PHYSICAL PROPERTIES

Product Name	Tex Designation	Sizing	Strand Solids			Minimum Tensile	
			Nominal Percent Strand Solids	Minimum Percent Strand Solids	Maximum Percent Strand Solids	Lbs	Newtons
ECG150 1/0 4.0Z	EC9 33 1X0 Z160	620	1.38	1.13	1.63	3.2	14.2
ECG75 1/0 4.0Z	EC9 68 1X0 Z160	620	1.20	0.94	1.46	5.7	25.4
ECG75 1/ 2 2.8S	EC9 68 1X2 S112	620	1.20	0.94	1.46	11.4	50.8
ECG50 1/0 0.7Z	EC9 99 1X0 Z28	620	1.28	1.02	1.54	9.0	40.1
ECG50 1/0 4.0Z	EC9 99 1X0 Z160	620	1.15	0.95	1.35	9.0	40.1
ECG37 1/ 2 2.8S	EC9 134 1X2 S112	620	1.28	1.02	1.54	20.0	89.0
ECG37 1/3 3.8S	EC9 134 1X3 S152	620	1.20	0.94	1.46	30.0	133.5
ECG37 1/0 4.0z	EC9 134 1x0 z160	620	1.20	0.94	1.46	10	44.5

A. Breaking Strength - The strength is expressed in pounds (newtons) per end. The minimum strength will be the average of four breaks per package.

B. Moisture - The maximum moisture for individual packages is 0.75%.

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VI. AVAILABLE PRODUCTS AND ADDITIONAL PHYSICAL PROPERTIES – cont'd

C. Test Methods for Physical Properties

The physical properties as listed in this specification shall be tested according to the methods as specified in the reference listed below:

1. Yards per Pound (Linear Density - TEX) - W-07Ea-T*
2. Ignition Loss - W-07Ea-T*
3. Breaking Strength - S-01Gd*
4. Twist per Inch (per Meter) - D-15A-T*.

* Owens Corning Test Methods. Copies available upon request.

**Additional Comments - Physical test methods will soon be changed to ASTM Methods where applicable.

VII. AVAILABLE PRODUCTS AND VISUAL PROPERTIES

Product Name	Tex Designation	Sizing	Maximum Average Broken Filaments (360° Count)	Filament Count*	Approximate Yarn Diameter		Twist Tolerance	
					Inches	mm	TPI	TPM
ECG150 1/0 4.0Z	EC9 33 1X0 Z160	620	30	204	0.0080	0.203	± 0.60	± 24
ECG75 1/0 4.0Z	EC9 68 1X0 Z160	620	30	408	0.0106	0.269	± 0.60	± 24
ECG75 1/ 2 2.8S	EC9 68 1X2 S112	620	30	816	0.0149	0.378	± 0.57	± 23
ECG50 1/0 0.7Z	EC9 99 1X0 Z28	620	30	612	0.0140	0.356	± 0.21	± 8
ECG50 1/0 4.0Z	EC9 99 1X0 Z160	620	30	612	0.0140	0.356	± 0.60	± 24
ECG37 1/ 2 2.8S	EC9 134 1X2 S112	620	30	1632	0.0224	0.568	± 0.57	± 23
ECG37 1/3 3.8S	EC9 134 1X3 S152	620	30	2498	0.0261	0.663	± 0.57	± 23
ECG37 1/0 4.0z	EC9 134 1x0 z160	620	30	816	0.0156	0.396	± 0.60	± 24

* The number of filaments and approximate yarn diameter are for reference purposes only. Yarns are controlled according to yards per pound (linear density-TEX).



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VII. AVAILABLE PRODUCTS AND VISUAL PROPERTIES – cont'd

- A. The product shall be free of the following internal or external (depending where found) characteristics.

Entrapped Waste	Dirt, Grease or Oil
Ends Out	Mixed Yarns**
Damaged Yarn*	Cut Tubes
Unbalanced Yarn	Cracked Tubes
Sloughed Yarn*	Protruding Ends (start up)
Bad Builds	Loops
Water Spots	Broken Filaments (fuzz)

* AGY accepts no responsibility for any damaged or sloughed material that is contained in a carton which shows any evidence of physical abuse. Any carton showing evidence of having been opened from the bottom will be considered as having been mishandled by the customer. Such damage or questions of damage is the responsibility of the carrier as, according to AGY terms of sale, delivery to the carrier constitutes delivery to the customer. AGY accepts no responsibility for any damage occurring in a customer's plant.

**In the event that AGY or the customer has reason to suspect that a shipment may contain MIXED YARN, the party first suspecting such condition will notify the other, and AGY assumes responsibility for initiating appropriate action. The use of the suspect material should be discontinued pending an investigation of the facts.

B. Visual Tolerance

1. Protruding Ends and Loops
A protruding end or loop resting on the base of the bobbin is permissible.
2. Bad Builds
The build shall not extend beyond the edge of the bobbin base and undercuts shall not exceed 3/16" (5mm).



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VIII. PACKAGING WEIGHT AND METERING DATA

- A. Average package weight is for information only.
- B. All packages are completely splice-free.
- C. Metered and non-metered material is packaged separately.

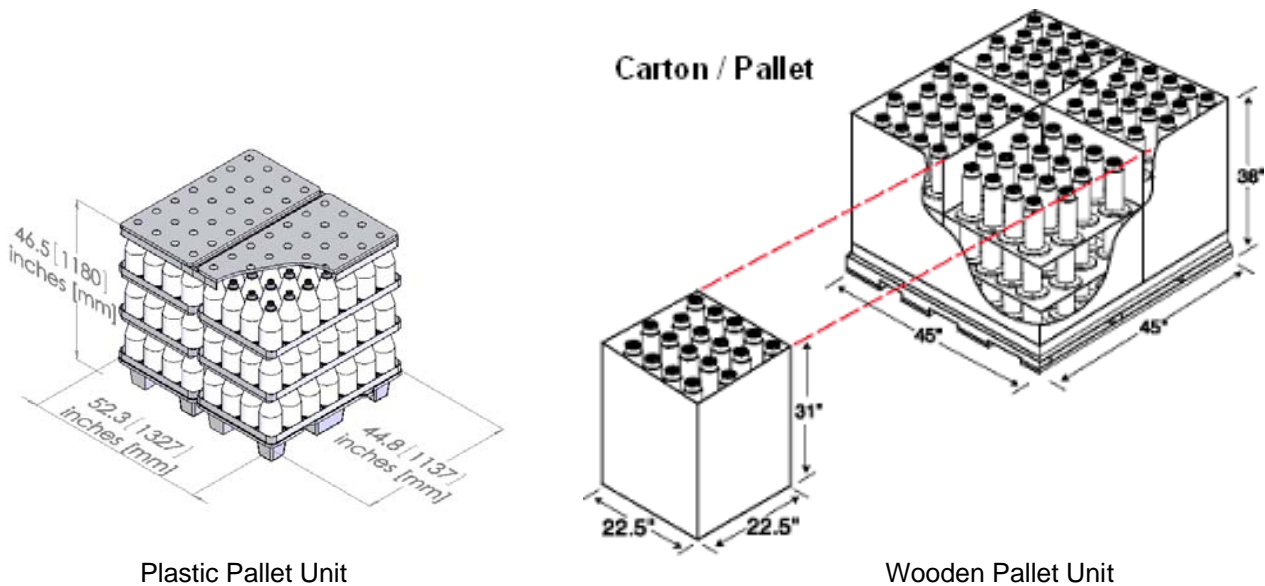
Product Name	Tex Designation	Sizing	Bobbin Type	Average Package Weight		Shipment Makeup		Comments
				Lbs.	Kg	Ratio	Description	
ECG150 1/0 4.0Z	EC9 33 1X0 Z160	620	9228	7.5	3.4	70%	Mtd 112,450 yds (102,824 m)	Note: 3
				5.5	2.5	30%	2.0 lbs (0.91 kg) to full	
ECG75 1/0 4.0Z	EC9 68 1X0 Z160	620	9228	7.5	3.4	70%	Mtd 55.103 yds (50,386 m)	Note: 3
				6.0	2.7	30%	2.0 lbs (0.91 kg) to full	
ECG75 1/ 2 2.8S	EC9 68 1X2 S112	620	8542	9.7	4.4	100%	2.0 lbs (0.91 kg) to full	Note: 1, 2
ECG50 1/0 0.7Z	EC9 99 1X0 Z28	620	8571	18.0	8.2	70%	Mtd 89,108 yds (81480 m)	Note: 1, 2, 3
				12.5	5.7	30%	5.0 lbs (2.3kg) to full	
ECG50 1/0 4.0Z	EC9 99 1X0 Z160	620	9228	7.5	3.4	70%	Mtd 37,485 yds (34,376 m)	Note: 3
				5.6	2.6	30%	2.0 lbs (0.91 kg) to full	
ECG37 1/ 2 2.8S	EC9 134 1X2 S112	620	8542	7.0	3.2	100%	2.0 lbs (0.91 kg) to full	Note: 1, 2
ECG37 1/3 3.8S	EC9 134 1X3 S152	620	8542	7.1	3.2	100%	2.0 lbs (0.91 kg) to full	Note: 1, 2
ECG37 1/0 4.0z	EC9 134 1x0 z160	620	9228	5.9	2.7	100%	2.0 lbs (0.91 kg) to full	

Notes

- 1. Available with transfer tails only
- 1. Available with treatment only
- 3. Metering tolerance for all yarns is plus 3%.

IX. PACKAGE DESCRIPTION

The primary form of packaging utilizes a returnable plastic pallet or wooden pallet system as shown.



Plastic Pallet Unit

Wooden Pallet Unit

For additional information and details on the various types of packaging that available, please see AGY Document AGY-PD1 (Packaging for Fiberglass Continuous Yarn.)

X. PREPARATION FOR SHIPMENT

A. Package Identification

1. Each package will be identified by an identification disc.
2. The discs for the various yarn constructions will be per the system of identification set up by AGY.

B. The packages shall be packed in a container suitable to insure adequate protection in transit and stores.

B. A content label shall adequately identify each carton.

Document history: This is the recent history for this document.

Date	Description	Author
5/13/10	Changed the bare glass yield specs to 1142 min, 1233 target and 1324 max.	Ward Aston
6/8/10	Changed the strand solids LSL from 0.94 to 1.02, target from 1.20 to 1.28 and USL from 1.35 to 1.54.	Ward Aston

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