



# CUSTOMER ACCEPTANCE STANDARD

No.: TP-669  
Date: 28-Jan-11  
Supersedes: NEW  
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## DIRECT SIZE E-GLASS YARNS - FOR STRENGTH CRITICAL APPLICATIONS

### I. DESCRIPTION

Fiberglass yarn is a natural, lustrous, white, continuous filament yarn that is twisted on 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 947 size is specifically designed for good wet-out and good adhesion in epoxy, phenolic, polyamide, cyanate ester and high temperature resins.

### II. USE

Yarns with 947 sizing are intended primarily for weaving processes for use where enhanced composite properties are needed, such as aerospace fabric applications.

### III. YARN NOMENCLATURE

#### Example Product Name (US Customary System)

ECDE75 1/0 1.0Z

E - Electrical glass formulation

C - Continuous filaments

DE - Filament diameter (See Table 1)

75- Yards per pound divided by 100

1/0- Single yarn end

1.0Z - Turns per inch (TPI), twist (Z or S)

#### Example Product Name (SI System)

EC6-66 1x0 Z40

E - Electrical glass formulation

C - Continuous filaments

6 - Filament diameter (See Table 1)

66 - grams per 1000 meters of yarn

1x0 - Single yarn end

Z40 - Turns per meter (TPM), twist (Z or S)

Over time, 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.



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## IV. GENERAL INFORMATION

Reference AGY Technical Product Guide for more information

Filament Designation		Range for Filament Diameter Average *			
US Units (letter)	SI Units (microns)	Minimum (inches)	Maximum (inches)	Minimum (microns)	Maximum (microns)
DE	6.0	0.00023	0.000269	5.84	6.85

The yarns are twisted onto plastic single flange bobbins with a milk bottle type build, which is suitable for over-end removal only. 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" (5 mm). The bobbins have no defects on the nose, which would interfere with the smooth removal of the yarn.

\* Filament diameter is for reference purposes. Yarns are controlled according to yield/tex.

## V. AVAILABLE PRODUCTS AND BARE GLASS PROPERTIES

Product Name*	Tex Designation*	Sizing	Bare Glass Yield**						
			Nom. Yds/Lb	Min Yds/Lb	Max Yds/Lb	Nom. Tex	Min. Tex	Max. Tex	Typical Cv***
ECDE 75 1/0 1.0Z	EC6-66 1X0 Z40	947	7500	6975	8025	66.1	61.8	71.1	2.3

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

\*\* Maximum and minimum yardage/tex limits based on  $\pm 3$  times the typical standard deviation.

## VI. AVAILABLE PRODUCTS AND ADDITIONAL PHYSICAL PROPERTIES

Product Name	Tex Designation	Sizing	Strand Solids (%)			Minimum Tensile	
			Nominal	Minimum	Maximum	Lbs	Newtons
ECDE 75 1/0 1.0Z	EC6-66 1X0 Z40	947	0.30	0.15	0.45	8.0	35.6

- Breaking Strength - The strength is expressed in pounds (Newtons) per end. The minimum strengths will be the average of five breaks per package.
- Moisture - The maximum moisture for individual packages is 0.75%.

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## 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. Filament Diameter - D-02C and D-02Ca-T\*
4. Breaking Strength - S-01Gd\* and S-01Fm-T\*\*
5. Twist per Inch (per Meter) - D-15A-T\*.

\* Owens Corning Test Methods. Copies available upon request.

\*\* Owens Corning Test Methods for fine yarns (45,000 yield/11 tex or finer glass).

## VII. AVAILABLE PRODUCTS AND VISUAL PROPERTIES

Product Nomenclature		Sizing	Max. Broken Filaments (360° Count)	Filament Count*	Approx. Yarn Diameter		Twist Tolerance	
US Customary System	Tex/Metric System (SI)				In.	mm	TPI	TPM
ECDE 75 1/0 1.0Z	EC6-66 1X0 Z40	947	20	816	0.0106	0.269	± 0.30	± 12

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

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 that 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.

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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. Products sold as metered and non-metered (full/not-full) are packed separately.

Product Name	Tex Designation	Sizing	Bobbin Type	Avg. Pkg. Weight		Shipment Makeup		Comments
				Lb.	Kg	Ratio	Description	
ECDE 75 1/0 1.0Z	EC6-66 1X0 Z40	947	8542	8.0	3.6	75%	Mtd. 60,000 yd (54,864 m)	Note 1
				6.1	2.8	25%	2.0# (0.91kg) to full	

### Notes:

- 1. Metering tolerance is -0 / +3%

## IX. PACKAGE DESCRIPTION

- A. See AGY packaging document AGY – PD1 for more information.

## X. PREPARATION FOR SHIPMENT

### A. Package Identification

- 1. An identification disc will identify each package.
- 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.*

- C. A content label shall adequately identify each carton.

## Document history

Date	Description of Change	Author
1/28/11	Original Issue	B. Thomson

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