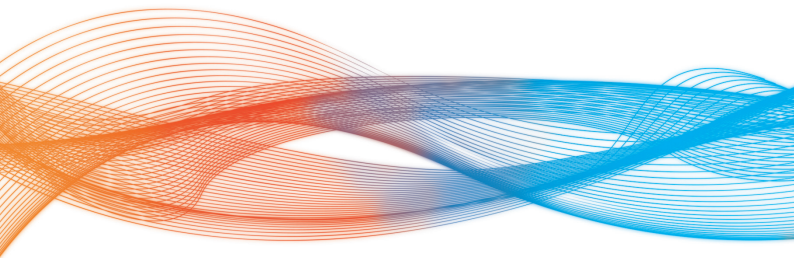


YARN PROCESSING

FACTS
PLIED & TEXTURIZED GLASS YARNS



TEXTILGLAS-
TECHNOLOGIE

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INTRODUCTION

Culimeta is the worldwide market leader for the production of twisted and texturized glass yarns. Our global operating twisting mills are able to manufacture yarns up to 10 strands. As per customers request, combinations with Aramid, Basalt, PES & stainless steel are also available. All factories are ISO certified. Ongoing investments into people and state-of-the-art-equipment guarantee the highest quality level.

Manufacturing of Glass

E-Glass yarns are manufactured in special furnaces at about 1450 °C. It's basic strand is made by forming and it is achieved by drawing the glass through the holes of bushings at high speed. E-glass yarns consist between 200 and 1.600 filaments and are defined by their diameter in microns. It's linear mass is expressed in tex (g/km).

Direct cabling

The process is capable of making 2-ply yarns. Twisting up to 520 tpm/13tpi is possible. The finished yarn is presented on BBC bobbin.

Ring twisting

This process is capable of making up to 10-ply yarns. Twisting up to about 340 tpm/8.5 tpi is possible. The 100% balanced yarn is presented on returnable plastic bobbins H6, H5, H8 or H9. Tie on tail can be offered according to customers needs.

Sizing (Binder)

All single glass yarns used at Culimeta are having an individual binder. The yarn is receiving the binder directly after it leaves the bushing at the furnace. Only for some texturized products Culimeta is adding its own binder to the yarn. (O.S. 1)

The binder, mainly made up of organic products in dispersed water, gives all our products its typical characteristics for the end application.

Mainly starch oil-based binders for a wide range of applications (textiles) but also silane-based binders for composite and special applications are available.



TECHNICAL DATA

Composition of different fibres

Oxide	E-glass (%)	S-2 Glass® (%)	ECR-glass
SiO ₂	52 – 56	64 – 66	54 – 62
Al ₂ O ₃	12 – 16	24 – 25	9 – 15
B ₂ O ₃	5 – 10	–	–
CaO	16 – 25	0 – 0.2	17 – 25
MgO	0 – 5	9.5 – 10	0 – 4
Na ₂ O + K ₂ O	0 – 2	0 – 0.2	2 – 5
TiO ₂	0 – 1.5	–	–
Fe ₂ O ₃	0 – 0.8	0 – 0.1	0 – 0,8
F ₂	0 – 1	–	–

E-Glass – Technical Data

Physical properties

Properties	Unit	E-glass
Density	g/cm ³	2.60
Hardness (Vickers 50 g – 15 s)	–	5.60
Sound velocity	m/s	5 6 8 0

Mechanical properties

Properties	Unit	E-glass
Virgin filament	MPa	3400
	ksi	493
Impregnated strand tensile test	MPa	2400
(calculated on fiber cross section)		
	ksi	348
Tensile modulus	Gpa	73
	msi	10.5
Tenacity (sized yarn)	cN/Tex	Min. 50
Elongation at break for sized yarns	%	2.2 – 2.5
according to binder system		
Elastic recovery	%	100

Electrical properties

Properties	Unit	E-glass
Dielectric constant at 1 MHz	—	6.4
Dielectric constant at 1 GHz	—	6.13
Loss angle at 1 MHz	—	0.0018 to 0.0039
Loss angle at 1 GHz	—	0.0039
Volume resistivity	Ohm.cm	1014-1015
Surface resistivity	Ohm.cm	1013-1014
Electrical regidity	kV/mm	8 – 12

Thermal properties

Properties

Softening point (Littleton)	°C	840
Strain point (Littleton)	°C	617
Linear coefficient		
of thermal expansion	m/m/°C	5.3 ₀₋₆
Specific heat	J/g. °K	0.764 at 20°C 0.958 at 200°C
Coefficient of thermal conductivity	W/m. °K	1.0

Thermal resistance of E-glass virgin filament

Temperature °C	Residual strength (%) E-glass
-200	100
200	98
300	82
400	65
500	46

SALES AND SERVICES

Business Unit Director

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Customer Service

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Technical Director

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OUR YARN PROCESSING PLANTS:

1. **Culimeta Textilglas-Technologie GmbH & Co. KG**

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3. **Culimeta France S.a.r.l.**

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4. **SIA "Culimeta Baltics"**

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Cempu iela 33

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Phone: +371 (0) 642 35 441



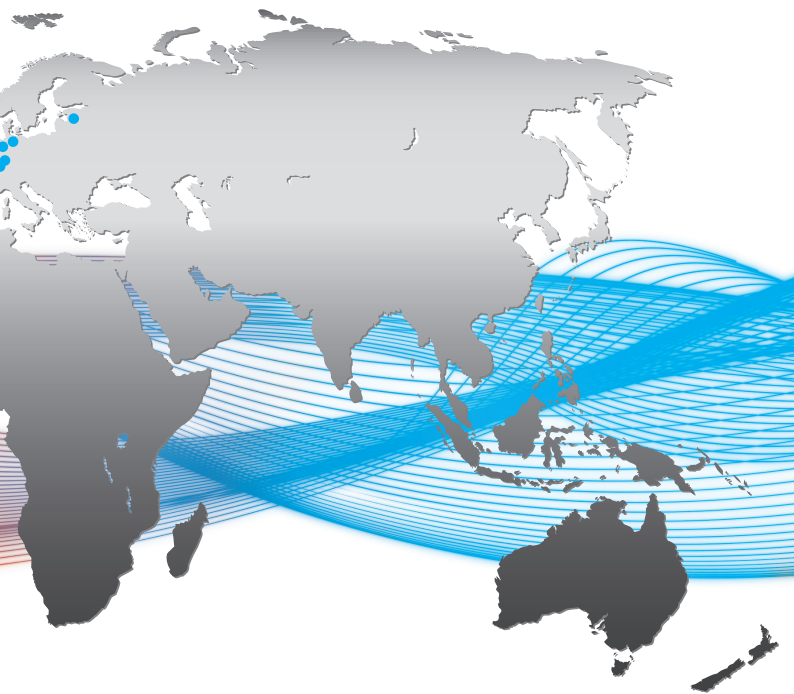
4. **Culimeta USA Sales Office**

Sales Office Charlotte, NC

Phone: +1 704 499 7698

CULIMETA WORLDWIDE





- Culimeta Textilglas-Technologie GmbH & Co. KG, Bersenbrück (Germany)
- Culimeta Textilglas-Technologie GmbH & Co. KG, Mölln (Germany)
- Culimeta France S.a.r.l., La Grand-Croix (France)
- SIA "Culimeta Baltics", Valmiera (Latvia)
- Culimeta Sales Office, Charlotte, NC (USA)

PLIED YARN NOMENCLATURE

Example: EC-9 136 X 3 S135 C1 H8 (According to ISO 2078)

- E** - Type of glass
- C** - Kind of filament (continuous)
- 9** - Filament diameter (μm)
- 136** - TEX Single yarn (g/1000 m)
- X 3** - Number of yarns
- S** - Direction of turns (S/Z)
- 135** - Turns per meter (TPM)
- C1** - Size/Binder (textile/silane)
- H8** - Type of bobbin

Example: ECG 37 1/3 3.4 S C1 H8 (According to ASTM D578)

- E** - Type of glass
- C** - Kind of filament (continuous)
- G** - Filament diameter US Unit
- 37** - Linear density in 100 yards/pounds
- 1/3** - 1st digit: number of identical
single yarns twisted together
- 2nd digit: number of plied yarns twisted together
- 3.4** - Final twist in turns/inch
- S** - Final twist direction
- C1** - Size/Binder
- H8** - Type of bobbin

PLIED YARN CONSTRUCTION

EU-Unit (TEX) TPM		US-Unit (yd/lb)	TPI	Bobbin
EC-4 33 X 2 X 2	S150	BC 150 2/2	3.8S	H8
EC-4 33 X 2 X 3	S135	BC 150 2/3	3.4S	H8
EC-4 33 X 4 X 3	S150	BC 150 4/3	3.8S	H8
EC-5 2,8 X 2	S180	ECD 1800 1/2	4.5S	7636
EC-5 5,5 X 2	S180	ECD 900 1/2	4.5S	7636/H3
EC-5 11 X 2	S110 – S180	ECD 450 1/2	2.8S – 4.5S	7636/H3/H6
EC-6 34 X 2	S150	ECDE 150 1/2	3.8S	H5/BBC
EC-6 34 X 3	S150	ECDE 150 1/3	3.8S	H5
EC-6 68 X 2	S112 – S150	ECDE 75 1/2	2.8S – 3.8S	H8/H5/BBC
EC-6 68 X 3	S112 – S150	ECDE 75 1/3	2.8S – 3.8S	H8/H5
EC-6 68 X 4	S112 – S150	ECDE 75 1/4	2.8S – 3.8S	H8/H5
EC-6 68 X 2 X 2	S120	ECDE 75 2/2	3.0S	H8/H5
EC-6 68 X 2 X 3	S120	ECDE 75 2/3	3.0S	H8/H5
EC-6 134 X 2	S120/135	ECDE 37 1/2	3.0S/3.4	H8/H5/BBC
EC-6 134 X 3	S135	ECDE 37 1/3	3.4S	H8/H5
EC-6 134 X 4	S120/135	ECDE 37 1/4	3.0S/3.4S	H8/H5
EC-6 134 X 5	S120/135	ECDE 37 1/5	3.0S/3.4S	H8/H5
EC-7 22 X 2	S150	ECE 225 1/2	3.8S	H5/BBC
EC-7 22 X 3	S150	ECE 225 1/3	3.8S	H5
EC-9 34 X 2	S112 – S150	ECG 150 1/2	2.8S – 3.8S	H5/BBC
SC-9 33 X 2	S112 – S150	SCG 150 1/2	2.8S – 3.8S	H5/BBC
EC-9 34 X 3	S112 – S150	ECG 150 1/3	2.8S – 3.8S	H8/H5
EC-9 68 X 2	S112 – S150	ECG 75 1/2	2.8S – 3.8S	H9/H8/H5/BBC
EC-9 68 X 2 +V4A	S112 – S150	ECG 75 1/2 + Steel	2.8S – 3.8S	BBC
SC-9 66 X 2	S112 – S150	SCG 75 1/2	2.8S – 3.8S	H5/BBC
EC-9 68 X 3	S112 – S150	ECG 75 1/3	2.8S – 3.8S	H9/H8/H5
EC-9 68 X 4	S112 – S150	ECG 75 1/4	2.8S – 3.8S	H9/H8/H5
EC-9 68 X 5	S112 – S150	ECG 75 1/5	2.8S – 3.8S	H9/H8
EC-9 110 X 2	S120	ECG 45 1/2	3.0S	H8
EC-9 110 X 3	S120	ECG 45 1/3	3.0S	H8
EC-9 136 X 2	S112 – S150	ECG 37 1/2	2.8S – 3.8S	H9/H8/H5/BBC
EC-9 136 X 3	S112 – S150	ECG 37 1/3	2.8S – 3.8S	H9/H8/H5
EC-9 136 X 4	S112 – S150	ECG 37 1/4	2.8S – 3.8S	H9/H8/H5
EC-9 136 X 5	S112 – S150	ECG 37 1/5	2.8S – 3.8S	H9/H8/H5
EC-11 51 X 2	S150	ECH 100 1/2	3.8S	H5/BBC
EC-11 51 X 3	S150	ECH 100 1/3	3.8S	H8/H5
EC-13 136 X 2	S135	ECK 37 1/2	3.4S	H8
EC-13 136 X 3	S135	ECK 37 1/3	3.4S	H8
EC-13 136 X 4	S135	ECK 37 1/4	3.4S	H8
EC-13 136 X 5	S135	ECK 37 1/5	3.4S	H8

EU-Unit (TEX) TPM**US-Unit****TPI****Bobbin**

EC-13 272 X 4	S100	ECK 18 1/4	2.5S	H8
EC-13 272 X 5	S100	ECK 18 1/5	2.5S	H8
EC-13 408 X 2	S100	ECK 12 1/2	2.5S	H8
EC-13 408 X 3	S100	ECK 12 1/3	2.5S	H8
EC-13 408 X 4	S100	ECK 12 1/4	2.5S	H8
EC-13 408 X 5	S100	ECK 12 1/5	2.5S	H8
EC-13 544 X 2	S100	ECK 9 1/2	2.5S	H8
EC-13 544 X 3	S100	ECK 9 1/3	2.5S	H8
EC-13 544 X 4	S100	ECK 9 1/4	2.5S	H8
EC-13 544 X 5	S100	ECK 9 1/5	2.5S	H8

Packaging

	BBC	7636	H5
Bobbins/pallet	72-92	216	92
Dim. (m) L, W, H.:	1,00 x 1,20 x 1,30	1,15 x 1,15 x 0,92	1,00 x 1,20 x 0,93
Max. weight (kg):	720 kg	500 kg	450 kg

	H8	H9
Bobbins/pallet	60	60
Dim. (m) L, W, H.:	1,20 x 1,15 x 1,00	1,32 x 1,13 x 1,00
Max. weight (kg):	450 kg	528 kg

Available tpm/tpi:

1. Direct cabling process (BBC)	up to 520 tpm/13 tpi in „S“ and „Z“ Direction
2. Ring twisting process (H9/H8/H5)	up to 340 tpm/8.5 tpi in „S“ and „Z“ Direction

Quality Control:

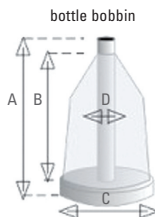
TEX:	Tensile strength (N)	TPM/TPI
ISO 1889	ISO 3341	ISO 1890

Other constructions available upon request

STANDARD BOBBIN DESIGN FOR TWISTED GLASS YARNS

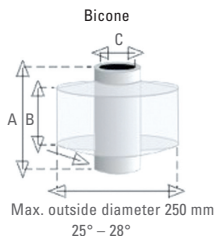
H9, H8, H5, H6, (Plastics tube)

	H9	H8	H5	H6
Height (A) mm	446	446	395	336
Height (A) inches	17,56	17,75	15,55	13,25
Winding Height (B) mm	375	375	345	290
Winding Height (B) inches	14,76	14,76	13,58	11,42
Base Plate (C) mm	203	190	150	152
Base Plate (C) inches	7,99	7,48	5,91	5,98
Inside Diameter (D) mm	82,9	82,9	60,15	60,15
Inside Diameter (D) inches	3,26	3,26	2,37	2,37
Max bobbin weight (kg)	8,8	7,5	5,0	4,5
Max bobbin weight (lbs)	19,39	16,58	11,02	9,80



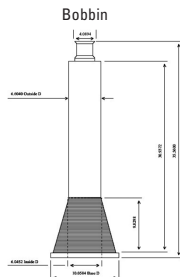
BBC (Biconc cardboard spool)

	BBC
Height (A) mm	230
Height (A) inches	9,05
Winding Height (B) mm	200
Winding Height (B) inches	7,86
ID (C) mm	69
ID (C) inches	2,71
AD MAX. (mm) (D)	250
AD MAX (inches) (D)	9,84
Max bobbin weight (kg)	10,00
Max bobbin weight (lbs)	22,04



7636

	SI (cm)
Type	Plastic Tube
Inside Diameter	6,05
Length	35,56
Traverse	30,94
Base Outside Diameter	10,06
Type Build	Double Taper
Bare bobbin nom. weight	229,3 g
Max. Full Package Dia.	11,43



CONVERSION: US – UNITS – EUROPEAN UNITS

			Number of filaments (approx.)								
			50	100	200	400	600	800	1200	1600	
µm	5	tex	2,8	5,5	11						
US	D	h.y.p.p.	1800	900	450						
µm	6	tex				34	68		136		
US	DE	h.y.p.p.				150	75		37		
µm	7	tex				22					
US	E	h.y.p.p.				225					
µm	9	tex				34	68	110	136	204	272
US	G	h.y.p.p.				150	75	45	37	25	18
µm	11	tex				51	102	204		340	
US	H	h.y.p.p.				100	50	25		15	
µm	13	tex				136		272		408	544
US	K	h.y.p.p.				37		18		12	9

tex:	g/1000 m
h.y.p.p.:	hundred yards per pound
yard (yd):	0,9144 m
inch (in):	25,4 mm
pound:	0,4536 kg

TEX = 4691/h.y.p.p.

Common twists on plied yarns

TPM	number of twists per meter
TPI	number of twists per inch (TPM/40)

T/m	Tpi
80	2.0
100	2.5
120	3.0
135	3.4
150	3.8
260	6.6

PRODUCT IDENTIFICATION WITH "PICCS"

Culimeta has invented a new system for marking all plied yarns products. The new way of labelling is named Culimeta PICCS. This stands for Product Identification Colour Code System and guarantees that every article has got a unique tab. As the name already indicates, the system is based on different colours which symbolise different characteristics of the product.

Article Code

Shows the specific article code which is also indicated in all documents.

Company Logo

Indicates the company group member who has manufactured the product.

Flag

Symbolises the country in which the product has been produced.



Filament Diameter

The outer colour ring indicates the diameter of the basic glass filament used in this product (f.i. EC-9 = red colour).

Twist

The colour of the letters indicates the no. of twisted yarns (f.i. X2 = orange colour).

Tex weight

The ground colour of the first stripe indicates the tex weight of the single yarn (f.i. 68 = yellow colour).

Binder

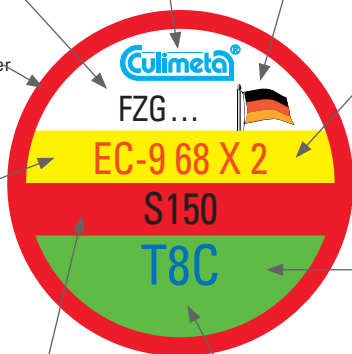
The ground colour indicates the type of binder which has been used in this product (f.i. green = T8C).

Turns per M (TPM)

The ground colour of the second stripe indicates the final number of turns per meter (f.i. S150 = red colour).

Glass Producer

The colour of the letters indicates the manufacturer of the raw glass fibres (f.i. blue = Saint-Gobain Vetrotex®).



TEXTURIZED GLASS YARNS

The production

Culimeta texturized glass yarns are available from 68 to 4500 tex and are mainly based on 6 (DE) or 9 (G) μm fibres. They are manufactured according to customer's specifications in an air jet process. Due to their volumes, texturized yarns are able to store more air and have therefore a higher insulating efficiency than smooth yarns. In addition to this, texturized yarns can be used for decorative applications such as wall covering. In principle there are 3 different processes available:

Single yarn texturizing (ET)

A single yarn is delivered with a certain overfeed to the air jet where the filaments are intermingled. (ET-6 70 tex G1) (DE75 1/0)



Parallel texturized yarns (PT)

Two or more yarns are delivered parallel with the same overfeed to the air jet where the filaments are intermingled to a new yarn. (PT-9 1000 tex G7/ETG 5.0)

Core & Effect texturized yarns (EGT)

One or more core yarns are delivered with a lower overfeed than the effect yarns to an air jet. The result of the intermingling is a very loopy or bulky yarn with excellent insulating properties.

Overspray (O.S. 1)

For special applications, such as wall covering, Culimeta is offering texturized yarns with an additional Overspray. One of the advantages is a higher tensile strength and less filamentation in further textile processes.

TEXTURIZED GLASS YARNS

Single end texturized e-glass yarns „NS“ (no overspray)

EU-Unit (TEX)	US-Unit (Inch pounds unit)
ET-6 70	DE75 1/0
ET-6 140	DE37 1/0
ET-9 70	G75 1/0
ET-9 140	G37 1/0

Core & effect texturized e-glass yarns „NS“ (no overspray)

EU-Unit (TEX)	US-Unit (Inch pounds unit)
EGT-6 75	ETDE75 1/0
EGT-6 140	ETDE37 1/0
EGT-6 160	ETDE37 1/0
EGT-9 350	ETG 14.2
EGT-9 442	ETG 11.2

Parallel texturized e-glass yarns 6µm/DE „NS“ (no overspray)

EU-Unit (TEX)	US-Unit (Inch pounds unit)
PT-6 280	ETDE 17.7
PT-6 420	ETDE 11.8
PT-6 500	ETDE 10.0
PT-6 550	ETDE 9.0
PT-6 640	ETDE 7.6
PT-6 820	ETDE 6.0
PT-6 1000	ETDE 5.0
PT-6 1250	ETDE 4.0
PT-6 1420	ETDE 3.5

Suitable for:

Braiding	Knitting	Filtration	Weaving & Tape Weaving	Ind. Packaging	Industrial app.	decorative
x	x	x	x	x	x	x

TEXTURIZED GLASS YARNS

Parallel texturized e-glass yarns 9µm/G „NS“ (no overspray)*

EU-Unit (TEX)	US-Unit (Inch pounds unit)
PT-9 280	ETG 17.7
PT-9 420	ETG 11.8
PT-9 500	ETG 10.0
PT-9 550	ETG 9.0
PT-9 640	ETG 7.6
PT-9 820	ETG 6.0
PT-9 1000	ETG 5.0
PT-9 1250	ETG 4.0
PT-9 1420	ETG 3.5
PT-9 1835	ETG 2.7
PT-9 2835	ETG 1.75
PT-9 3545	ETG 1.40
PT-9 4510	ETG 1.10

* ECR-glass available

Standard bobbins	Height	External diameter
Paper Tube	270 mm 10,62 inches	94,0 mm 3,7 inches

Quality Control	TEX	Tensile strength (N)	TPM/TPI
	ISO 1889	ISO 3341	–

Suitable for:

Braiding	Knitting	Filtration	Weaving & Tape Weaving	Ind. Packaging	Industrial app.	decorative
x	x	x	x	x	x	x

TEXTURIZED GLASS YARNS

Texturized e-glass yarns with protection twist; Bobbins H8 & H9*

EU-Unit (TEX)	TPM	US-Unit (Inch pounds unit)	TPI
PT-9 640	S/Z30-45	ETG 7.6	S/Z 1.12-0.75
PT-9 820	S/Z30-45	ETG 6.0	S/Z 1.12-0.75
PT-9 1000	S/Z30-45	ETG 5.0	S/Z 1.12-0.75
PT-9 1250	S/Z30-45	ETG 4.0	S/Z 1.12-0.75
PT-9 1420	S/Z30-45	ETG 3.5	S/Z 1.12-0.75
PT-9 2000	S/Z30-45	ETG 2.5	S/Z 1.12-0.75
PT-9 2500	S/Z30-45	ETG 2.0	S/Z 1.12-0.75

Texturized/plied e-glass yarns on paper tubes***

EU-Unit (TEX)	TPM	US-Unit (Inch pounds unit)	TPI
PT-9 640 X 2	S/Z28-100	ETG 7.6 1/2	S/Z 0.75-2.5
PT-9 820 X 2	S/Z28-100	ETG 6.0 1/2	S/Z 0.75-2.5
PT-9 1000 X 2	S/Z28-100	ETG 5.0 1/2	S/Z 0.75-2.5
PT-9 1250 X 2	S/Z28-100	ETG 4.0 1/2	S/Z 0.75-2.5
PT-9 1420 X 2	S/Z28-100	ETG 3.5 1/2	S/Z 0.75-2.5
PT-9 2000 X 2	S/Z28-100	ETG 2.5 1/2	S/Z 0.75-2.5
PT-9 2500 X 2	S/Z28-100	ETG 2.0 1/2	S/Z 0.75-2.5

* ECR-glass available *** can be reinforced with stainless steel

Standard bobbins	Height	External diameter
Paper Tube	292 mm 11,49 inches	73,0 mm 2,87 inches

Quality Control	TEX	Tensile strength (N)	TPM/TPI
	ISO 1889	ISO 3341	ISO 1890

Suitable for:

Braiding	Knitting	Filtration	Weaving & Tape Weaving	Ind. Packaging	Industrial app.	decorative
x	x	-	x	x	x	-

TEXTURIZED GLASS YARNS

Parallel texturized yarns with overspray (O.S. 1}

EU-Unit (TEX)	Overspray	US-Unit (Inch pounds unit)	TPI
ETLLEX 6-70	O.S.1	ETDE 75 1/0	O.S.1
ETLLEX 6-140	O.S.1	ETDE 37 1/0	O.S.1
ETLLEX 6-200	O.S.1	ETDE 25.9	O.S.1
ETLLEX 6-420	O.S.1	ETDE 11.8	O.S.1
ETLLEX 6-1000	O.S.1	EDTE 5.0	O.S.1
ETLLEX 6-1250	O.S.1	EDTE 4.0	O.S.1
ETLLEX 6-1460	O.S.1	ETDE 3.5	O.S.1
ETLLEX 9-140	O.S.1	ETG 37 1/0	O.S.1
ETLLEX 9-200	O.S.1	ETG 25.9	O.S.1
ETLLEX 9-420	O.S.1	ETG 11.8	O.S.1
ETLLEX 9-500	O.S.1	ETG 10.0	O.S.1
ETLLEX 9-550	O.S.1	ETG 9.0	O.S.1
ETLLEX 9-1000	O.S.1	ETG 5.0	O.S.1
ETLLEX 9-1250	O.S.1	ETG 4.0	O.S.1
ETLLEX 9-1415	O.S.1	ETG 3.5	O.S.1
ETLLEX 9-2835	O.S.1	ETG 2.70	O.S.1

Standard bobbin

	Height	External diameter
Paper Tube (Type 1)	165 mm 6,50 inches	93,1 mm 3,66 inches
Paper Tube (Type 2)	270 mm 10,62 inches	94,00 mm 3,70 inches

Quality Control

	TEX	Tensile strength (N)	TPM/TPI
LEX	ISO 1889	ISO 3341	—

Suitable for:

Braiding	Knitting	Filtration	Weaving & Tape Weaving	Ind. Packaging	Industrial app.	decorative
x	x	x	x	x	x	x

TISSMELT E-GLASS/ POLYESTER TWISTED YARNS

TISSMELT twisted yarns are constructed from a high quality combination of E-glass and PES (Thermal class "B") and produced by our French factory (Nouvelle Tissafil S.a.r.l.).

TISSMELT provides excellent flexibility and abrasion resistance with special bonding characteristics for steel, aluminium and copper.

TISSMELT applications include: insulation of aluminium and copper wires for motors, transformers and generators and melting threads on glass fibre fabrics.

TISSMELT E-GLASS/POLYESTER YARNS

DESIGNATION	Tissmelt (EC5 2,8 + PES 22)	Tissmelt (EC5 2,8 + PES 50)	Tissmelt (EC5,5 + PES 50)	Tissmelt (EC5 11 + PES 76)	Tissmelt (EC9 68 + PES HT 1100)
	5 TEX	8 TEX	11 TEX	20 TEX	178 TEX

YARN COUNT					
Average norm : +/- 3%	5 TEX	7,8 TEX	10,5 TEX	18,6 TEX	179 TEX

TENSILE STRENGTH (N)					
Average norm : +/- 5%	2,1	2,1	4,2	6,6	50,4

TWIST (TPM)					
Average norm: +/- 8%	S 120	S 120	S 120	S 120	S 80

COMPOSITION	Glass: 56%	Glass: 36%	Glass: 52%	Glass: 59%	Glass: 38%
	PES:44%	PES:64%	PES:48%	PES:41%	PES:62%

PRESENTATION (Make-up)	Tube 0,79 kg	Tube 1,2 kg	Tube 2 kg	Tube 3 kg	Tube 3,1 kg
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SEWING THREADS

Our delivery programme includes sewing threads in the diameter range from 0,30 mm to 0,50 mm. They are available with V4A (stainless steel) or Inconel reinforcement and can be treated with a PTFE coating and oil to ensure easy sewing.

Standard range

Type	tex (g/1000 m)	Tensile strength (N)	Coating	PTFE content	Oil content	Silicone content
Approx. diameter: 0,3 mm						
MN-30	170	>65	PTFE	15 – 20%		
MN-30	190	>65	PTFE / Oil	15 – 20%	8 – 10 %	
MN-30	160	>65	Silicone			8 – 10 %

Type	tex (g/1000 m)	Tensile strength (N)	Coating	PTFE content	Oil content	Silicone content
Approx. diameter: 0,4 mm						
MN-40	250	>95	PTFE	15 – 20%		
MN-40	275	>95	PTFE / Oil	15 – 20%	8 – 10 %	
MN-40	230	>95	Silicone			8 – 10 %
MN-40						
V4A (steel)	340	>80	PTFE	15 – 20%		
MN-40						
V4A (steel)	400	>80	PTFE / Oil	15 – 20%	8 – 10 %	

Type	tex (g/1000 m)	Tensile strength (N)	Coating	PTFE content	Oil content	Silicone content
Approx. diameter: 0,5 mm						
MN-50	350	>115	PTFE	15 – 20%		
MN-50	385	>115	PTFE / Oil	15 – 20%	8 – 10 %	
MN-50	320	>115	Silicone			8 – 10 %
MN-50						
V4A (steel)	430	>105	PTFE	15 – 20%		
MN-50						
V4A (steel)	470	>105	PTFE / Oil	15 – 20%	8 – 10 %	
MN-50						
Inconel	420	>105	PTFE	15 – 20%		
MN-50						
Inconel	460	>105	PTFE / Oil	15 – 20%	8 – 10 %	

The a.m. products are available on 0,5 kg / 1,1 lbs and 1,0 kg / 2,2 lbs king spools.

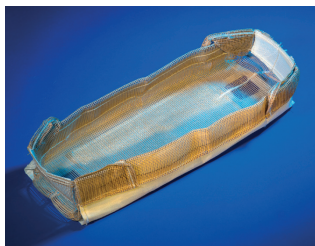
SEWING THREADS

Hand sewing threads for manual use

Culimeta "Hand sewing threads" are available from diameter 0,80 mm up to 2,00 mm. Like our machine sewing threads, the below mentioned yarns can also be reinforced with stainless steel. A final PTFE or PU coating is available as per standard.

Standard range

Type	Diameter (approx.)	tex (g/1000 m)	Type of coating	Coating content	Approx. bobbin weight
HN-80	0,8 mm	830	PTFE (brown)	15%	7,5 kg
HN-100	1,0 mm	1500	PTFE (brown)	15%	7,5 kg
HN-100	1,0 mm	1570	PTFE + V4A-Steel	15%	8,0 kg
HN-100	1,0 mm	1570	PTFE (grey) + V4A (steel)	15%	8,0 kg
HN-100	1,0 mm	1350	PU	6%	7,5 kg
HN-100	1,0 mm	1420	PU (grey) + V4A (steel)	6%	5,0 kg
HN-100	1,0 mm	1420	PU + V4A (steel)	6%	5,0 kg
HN-150	1,5 mm	2900	PTFE (white)	15%	7,3 kg
HN-150	1,5 mm	2900	PTFE (brown)	15%	7,3 kg
HN-200	2,0 mm	4800	PTFE (brown)	10%	6,0 kg



DYED / COLOURED GLASS YARNS

For special applications Culimeta is manufacturing dyed fibre glass yarns based on acrylic and PTFE colours. Special coatings with temperature resistance up to 400°C are possible.

Almost all common single- (EC-9 68/ECG75) and twisted yarns (EC-9 68 X 2/ECG75 1/2) can be coated in various colours according to customer's specifications. (See page 13/14)

Culimeta dyed glass yarns are suitable for braiding, knitting and weaving.

QUALITY MANAGEMENT/ CERTIFICATION

The demands of international customers regarding product quality and its documentation increase continually and are an important component of a future-oriented company philosophy. Culimeta took account of this trend and carried out the certifications audit DIN EN ISO 9001:2015.



SELECTED CONVERSIONS AND FORMULAE

1 oz/yd ²	=>	33,9057 g/m ²
1 g/m ²	=>	0,0295 oz/yd ²
1 oz	=>	28,35 g
1 g	=>	0,035 oz
1 lb	=>	16 oz
1 lb	=>	0,454 kg
1 kg	=>	2,205 lb
1 N	=>	0,102 kgf
1 kgf	=>	9,81 N
1 lbf	=>	4,4482 N
1MPa	=>	1 N/mm ²
1 GPa	=>	1000 MPa
1 psi	=>	6,89 x 10 ⁻³ MPa
1 ksi	=>	6,89 MPa
1 Tex	=>	9 denier
1 denier	=>	0,111 Tex
1 Tex	=>	496.238 yards/lb
°C	=>	(°F-32) x 5/9
°F	=>	9/5 x °C +32
1 w.m ⁻¹ .k ⁻¹	=>	0,860 kcal.m ⁻¹ .h ⁻¹ .k ⁻¹ = 6,9 btu.in/(ft.hr.°F)
1"	=>	25,4 mm = 2,54 cm
1 lb/ft ²	=>	4,89 kg/m ²
1 lb/ft ³	=>	16,05 kg/m ³
1 yd	=>	0,91 m
1 m	=>	1,09 yd
1 ft	=>	0,3048 m
1 m	=>	3,281 ft
1 cm	=>	0,39 in

NOTES

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TEXTILGLAS-
TECHNOLOGIE

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