

Thermoplastic Adhesives

Griltex®

EMS





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Introduction

EMS-GRILTECH – The Leading Specialist for Thermoplastic Adhesive Bonding

EMS-GRILTECH offers the biggest portfolio of thermoplastic adhesive products for technical and textile bonding applications, which are well–known in the market under the trade name Griltex.

Griltex adhesives are thermoplastic Copolyesters and Copolyamides, which are available as granules/pellets, as powders in a range of particle sizes or as suspension. Manufacturing is managed in our own polymerisation and grinding plants.

Satisfy Customer Needs

EMS-GRILTECH has many years experience in the manufacture of tailor–made Copolyester and Copolyamide adhesives for different application fields. The melt temperatures and melt viscosities can be modified over a wide range to provide the specific properties our customers demand.

EMS-GRILTECH Serves a Variety of Industries

Griltex adhesives are successfully used for coating and lamination of technical textiles, apparel interlinings as well as non–textile applications. EMS-GRILTECH offers tailor made adhesives for transportation, building and construction, packaging, electronics, upholstery, apparel, sports and many others.

Development Partner for Innovative Solutions

EMS-GRILTECH seeks partnerships with our customers to develop our businesses to their fullest potential. On–site hands–on technical service, an industry leading applications lab, decades of technical experience, and extensive analytical testing capabilities are available and dedicated to support our partners.

These benefits offer a full service package for EMS customers. EMS is the leader in the thermoplastic adhesive market specializing in Copolyesters and Copolyamides.

Benefits and Applications of Griltex





Benefits of Griltex

- Broad range of melting points, viscosities and mechanical properties
- Solvent free
- Rigid to flexible
- Slow to very fast crystallizing
- Availability of different product forms
- Constant high quality
- Easy handling
- Health– and environmentally friendly materials

Applications of Griltex Products

- Films and webs
- Automotive applications
- Even surfaces
- Composite materials
- Transfer labels
- Masterbatches
- Apparel interlining
- Thin layer coating
- Flexible coating

Application Techniques

- Hotmelt lamination
- Bead / slot die
- Meltblown / spray
- Films / webs / nets
- Different powder techniques
- Suspension (Foulard process)
- Dipping

Griltex Nomenclature

Griltex D 2345E/A G F/P x–y

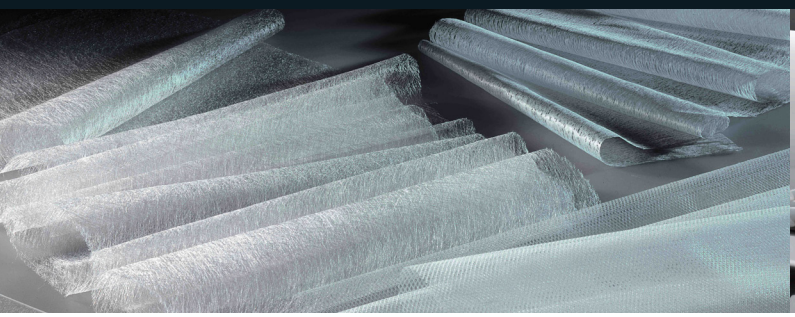
- Powder fractions
- Film quality
- Granules / pellets
- CoPES / CoPA
- Serial No.

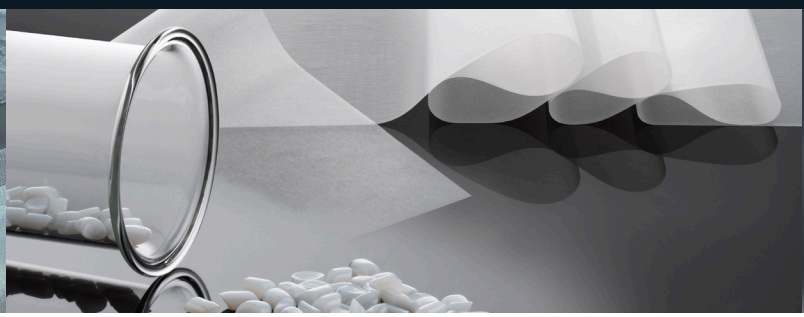
Griltex ES/CE/CT 123 G F/P x–y

- Application: Composites
- Application: Even Surfaces

Standard Powder Fractions

- P 1: 0 – 80 µm
- P 0 – 160: 0 – 160 µm
- P 82: 80 – 200 µm
- P 1 – 5: 100 – 500 µm
- P 2 – 5: 200 – 500 µm
- P 0 – 500: 0 – 500 µm
- P 0 – 800: 0 – 800 µm
- Other fractions on demand





Griltex for Films and Webs

Bonding with films or webs is a clean and easy process. These advantages have been recognized by many industries which increasingly depend on adhesive substrates.

Fast Crystallizing Copolyesters in Film Manufacturing

Fast crystallizing Griltex adhesives allow film production without need for release paper or carriers.

Benefits

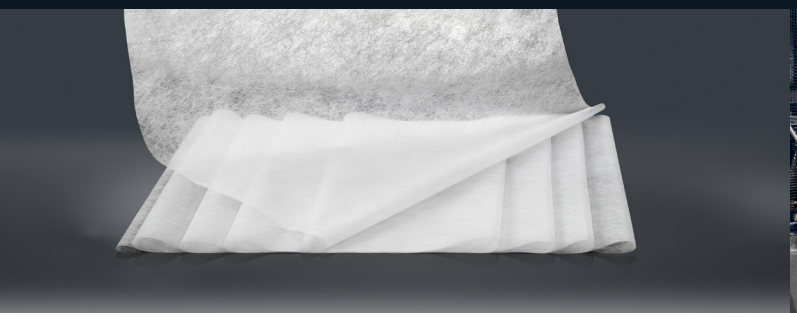
- Less material
- No waste
- Less weight
- Lower cost

Griltex	Melting Range DSC [°C]	Glass Transition Temperature DSC [°C]	Melt Viscosity (160 °C / 2.16 kg) [Pa*s]	MVR (160 °C / 2.16 kg) [cm³/10']
Copolyester				
6E	125 – 130	28	800	13
9E	118 – 123	19	350	30
D 1442E	105 – 115	3	700	15
D 1448E	100 – 107	15	500	21
D 1519E	120 – 130	15	1200	9
D 1553E	85 – 95	–14	300	35
D 1616E	85 – 95	–14	900	12
D 1619E	115 – 120	7	1100	10
D 1643E	120 – 130	12	420	25
D 1652E	80 – 85	–20	700	15
D 2308E	114 – 122	11	300	35
D 2368E	158 – 166	–1	30[1]	350[1]
D 2500E	114 – 122	1	400	26
Copolyamide				
1A	105 – 115	23	650	16
2A	120 – 130	17	600	18
D 1299A	112 – 118	25	120	90
D 1330A	125 – 135	29	140[2]	175[2]
D 1564A	105 – 115	23	650	16
D 1566A	115 – 125	17	150	70
D 1662A	110 – 120	27	1300	8
D 1666A	75 – 85	21	120	90
D 1858A	110 – 120	27	350	30

[1] 190 °C / 2.16 kg

[2] 275 °C / 5 kg

Griltex® EMS





Benefits and Properties

Copolyester

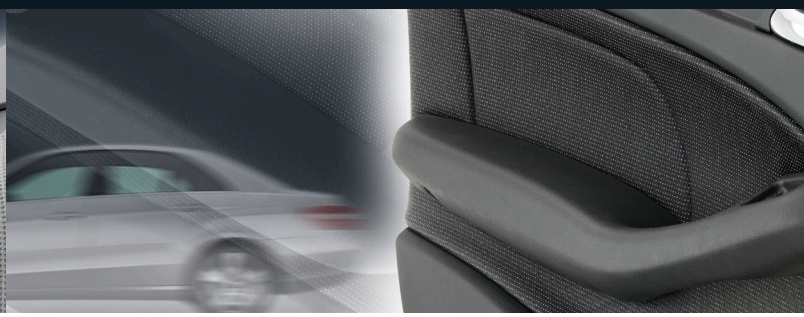
- Low fogging / VOC
- Adjustable flexibility
- Slow to fast crystallization speed
- Resistance against
  - Plasticizer
  - UV
  - Laundering
  - Dye migration

Copolyamide

- Resistance against
  - Hydrolysis
  - Organic solvents
  - Laundering and dry cleaning
- High transparency

Crystallization Speed	Flexibility	Blow Extrusion [°C]	Cast Extrusion [°C]	Griltex
				Copolyester
slow	low	150 – 190	190 – 230	6E
slow	low	140 – 170	170 – 210	9E
very fast	good	120 – 160	180 – 220	D 1442E
medium	medium	120 – 160	150 – 190	D 1448E
medium	medium	150 – 190	190 – 240	D 1519E
very fast	good	110 – 140	150 – 190	D 1553E
very fast	good	120 – 160	160 – 200	D 1616E
very fast	good	140 – 180	190 – 240	D 1619E
medium	medium	140 – 180	170 – 210	D 1643E
very fast	good	110 – 150	160 – 200	D 1652E
slow	medium	130 – 170	160 – 200	D 2308E
very fast	good	180 – 220	200 – 240	D 2368E
medium	medium	140 – 170	160 – 200	D 2500E
				Copolyamide
slow	low	140 – 180	180 – 220	1A
slow	low	140 – 180	180 – 220	2A
slow	low	120 – 150	160 – 180	D 1299A
slow	low	170 – 220	190 – 240	D 1330A
slow	low	140 – 180	180 – 220	D 1564A
slow	low	130 – 160	160 – 190	D 1566A
slow	low	150 – 190	190 – 230	D 1662A
slow	low	110 – 150	140 – 180	D 1666A
slow	low	130 – 160	170 – 210	D 1858A





Griltex for Automotive Applications

EMS-GRILTECH produces special and tailor–made Griltex Copolyester and Copolyamide adhesives for automotive applications.

Available as granules and powders they are suitable for all coating techniques. The exact combination of melting range and melt viscosity fulfills the demanding needs of the automotive industry.

Benefits

- Heat resistance
- Short bonding times
- High initial bonding strength
- High specific bonding strength (Less adhesive for the same bond)
- CoPES have a low content of volatile organic components (VOC)
- CoPES have low fogging (FOG) values
- Health– and environmentally–friendly materials
- Elimination of orange peel effect

Griltex	Melting Range	Glass Transition Temperature	Melt Viscosity	MVR	Heat Resistance	Emissions[1] VDA 278	
	DSC	DSC	(160 °C / 2.16 kg)		EMS	VOC[2]	FOG[3]
	[°C]	[°C]	[Pa*s]	[cm³/10']	[°C]	[ppm]	[ppm]
Copolyester							
6E	125 – 130	28	800	13	110	< 20	< 60
9E	118 – 123	19	350	30	100	< 20	< 60
D 1365E	98 – 107	18	450	23	80	< 20	< 60
D 1377E	150 – 160	25	300[4]	35[4]	130	< 60	< 60
D 1539E	118 – 126	19	100	105	100	< 20	< 60
D 2315E	110 – 118	–11	320	33	90	< 60	< 60
Copolyamide							
2A	120 – 130	17	600	18	115	< 400	< 150
D 1500A	85 – 95	22	150	70	80	< 300	< 150
D 1556A	130 – 140	31	500	21	125	< 600	< 150
D 1666A	75 – 85	21	120	90	60	< 300	< 150

[1] All measurements have been carried out on granules. Values are given without guarantee.
[2] VOC = Volatile Organic Components
[3] FOG = Fogging
[4] 190 °C / 2.16 kg

Automotive Applications

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Applications

- ABC–pillars
- Door trims
- Headliners
- Package trays
- Seats
- Leather

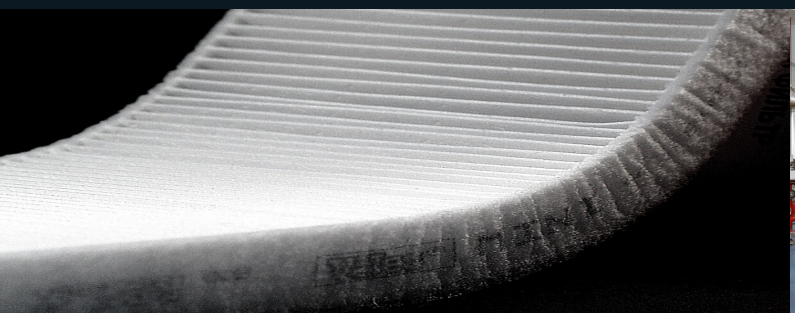
Application Techniques

- Hotmelt
- Meltblown / spray
- Powder
- Films and webs

Emissions

Method: VDA 278 (dynamic headspace)
Purpose: Determination of emissions in interior trim parts

Automotive Interiors						Griltex
ABC–Pillars	Door Trims	Headliners	Package Trays	Seats	Leather	
						Copolyester
x		x	x			6E
x	x	x	x	x		9E
	x	x		x		D 1365E
x		x	x			D 1377E
	x	x		x		D 1539E
	x	x		x		D 2315E
						Copolyamide
		x	x	x		2A
	x			x	x	D 1500A
	x	x	x			D 1556A
					x	D 1666A





Griltex for Automotive Filters

EMS-GRILTECH produces special Griltex Copolyester adhesives for automotive filters.

The high flexibility of Griltex thermoplastics can be adjusted to suit specific filter requirements. With melting points of up to 200 °C, Griltex adhesives fulfill all thermal stability needs.

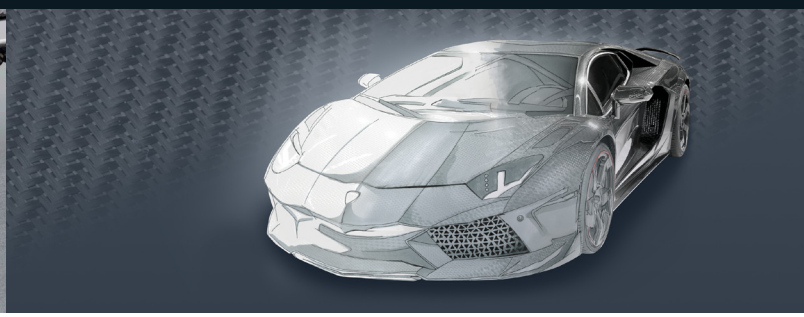
Benefits

- Outstanding and fast processing
- Resistance to degradation
  - o No soiling of the hotmelt unit
  - o No interruption of production for cleaning
- Low content of volatile organic components (VOC)
- Good bonding properties
- Good chemical resistance
- High flexibility
- Excellent cost–performance ratio
- Easy handling
- Health– and environmentally friendly materials

Griltex	Melting Range	Glass Transition Temperature	Melt Viscosity	MVR	Heat Resistance	Processing Temperatures		Automotive Filters		
	DSC [°C]	DSC [°C]	(160 °C / 2.16 kg) [Pa*s]	(160 °C / 2.16 kg) [cm³/10']	EMS [°C]	Nozzle [°C]	Lamination [°C]	Air	Cabin	Oil/ Fuel
Copolyester										
D 1533E	140 – 150	8	30[1]	350[1]	120	160 – 180	150 – 160		x	
D 1595E	142 – 148	–12	40[1]	265[1]	120	160 – 180	150 – 160		x	
D 1655E	185 – 195	–12	50[2]	210[2]	170	210 – 230	200 – 230	x		x
D 1717E	180 – 190	–8	30[2]	350[2]	170	210 – 230	200 – 230	x		
D 1765E	140 – 150	–15	80	130	120	160 – 180	160 – 170		x	
D 1839E	138 – 148	–12	30[1]	350[1]	120	160 – 180	150 – 160		x	

[1] 190 °C / 2.16 kg [2] 210 °C / 2.16 kg



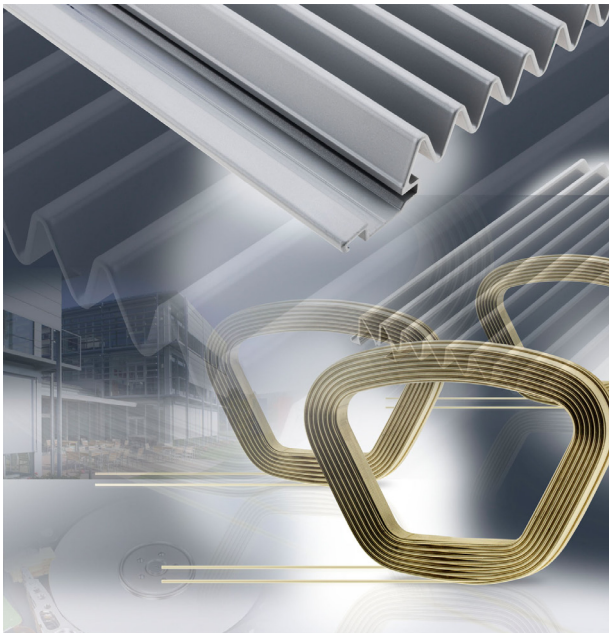


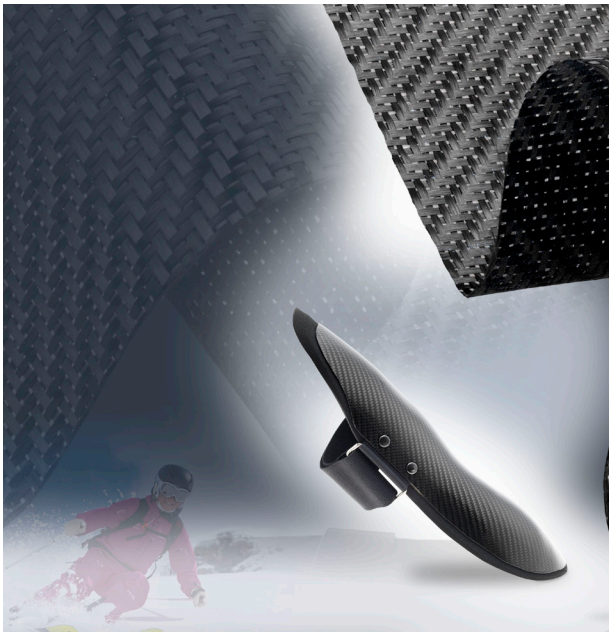
Griltex ES – Bonding of Even Surfaces

The ability to adhere to and assemble smooth and even surfaced materials meets a growing need in industrial applications. The benefits of such capability are seen in construction, packaging, automotive, specialty assemblies and coatings to name a few. More details about Griltex ES can be found in the separate brochure "Griltex ES – Bonding of Even Surfaces".

Griltex CE / CT for Composite Applications

High performance Copolyesters and Copolyamides are the speciality of EMS-GRILTECH. Under the trade names Griltex CE and Griltex CT specific products have been developed for carbon–, glass–, basalt– and polymeric fiber composites. More details about Griltex CE / CT can be found in the separate brochure "Griltex CE / CT for Composite Applications".









Griltex for Transfer Labels

Benefits

- Broad variety of different powder fractions
- Good adhesion to various substrates
- Solvent free
- Tin free
- Reduction of dye stuff migration
- No ageing
- Good dispersing properties
- Excellent compatibility with PVC–plastisols, acrylic– and PU–pastes

Added Value

Improvement of thermoplastic properties

15 – 20% of Griltex adhesive powder blended with PVC–plastisols, acrylic– or PU–pastes imparts thermoplastic properties into these reactive systems (printing and coating respectively). Selected Griltex grades reduce dye migration significantly.

Application Techniques

As dissolved or dispersed adhesive ink

Griltex adhesives are either dissolved in a solvent or dispersed in water and applied by spraying, printing or brushing.

As back coating of heat transfer labels

Griltex is scattered on the back of textile, PVC, acrylic or PU based labels. After sintering of the powder, they can be transferred by heat.

Griltex	Melting Range DSC [°C]	Resistance		Transfer Temperature [°C]
		Washing [°C]	Dry Cleaning	
Copolyester				
8E	110 – 115	60	+	> 120
D 1682E	118 – 123	75	+	> 125
D 2132E	110 – 118	60	+	> 115
Copolyamide				
1A	105 – 115	60	++	> 115
2A	120 – 130	95	++	> 135
D 1500A	85 – 95	60	++	> 95





Reduction of Dye Stuff Migration

Dye migration is a well–known problem for transfer labels. Especially red dyestuffs have a strong tendency to migrate from the textile substrate in the label. Directly after the transfer or after a storage time white areas appear in a colored tint.

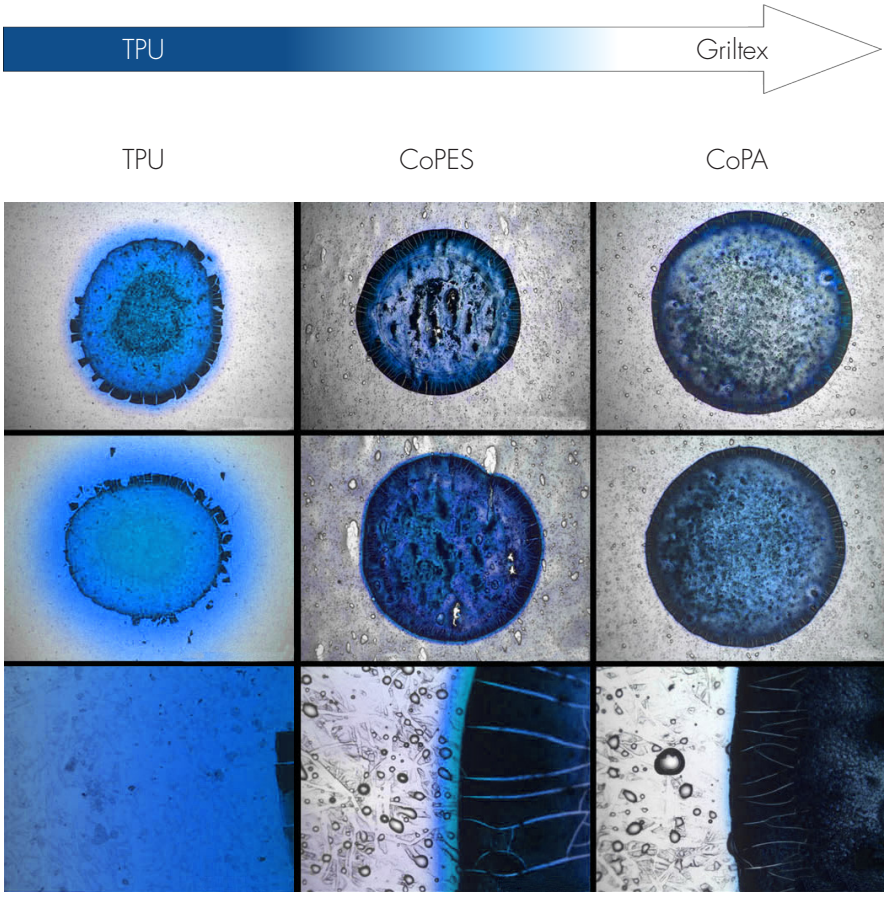
Selected Griltex grades reduce dye migration significantly!

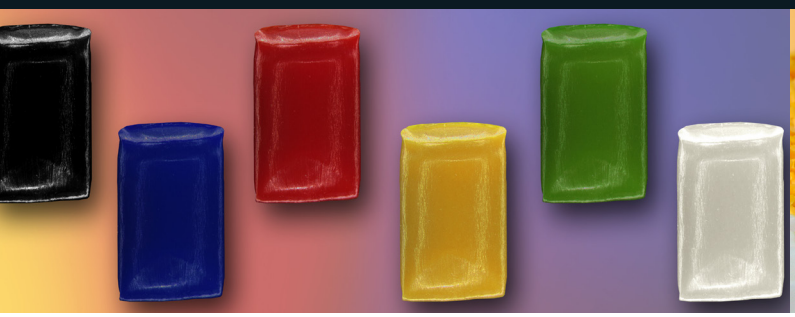


Labels without Griltex



Labels with Griltex







Griltex for Masterbatch

Benefits

- Good compatibility of Griltex Copolyesters with engineering polyesters (e.g. PET, PBT)
- Good compatibility of Griltex Copolyamides with engineering polyamides (e.g. PA 6, PA 66, PA 610, PA 12)
- Good compatibility of Griltex with engineering plastics (e.g. PC, PLA, TPU, TPE)
- Reduction of viscosity and shear forces
- Good dispersion of pigments, dyes and other components, even at high loads
- Compatible with processing steps like painting and printing
- REACH compliant

Applications

Griltex products are used either as carrier or additive in masterbatches for:

- Carbon black
- Pigments
- Dyes
- Stabilizers
- Flame retardants
- Additives

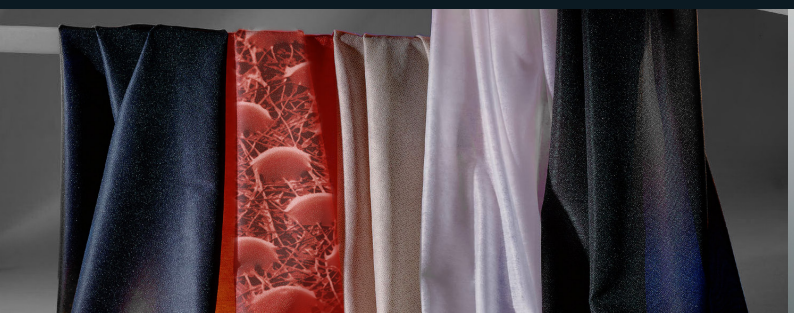
Application Techniques

Griltex containing masterbatches are used for:

- Extrusion
- Injection moulding
- Fiber spinning

Griltex	Melting Range DSC [°C]	Melt Viscosity (160 °C / 2.16 kg) [Pa*s]	MVR (160 °C / 2.16 kg) [cm³/10']	Polymer Matrix	Effect
Copolyester					
D 1502E	180 – 190	100[1]	105[1]	PET, PBT	Dispersion of pigments and carbon black, reduction of viscosity, stable intrinsic viscosity
D 1533E	140 – 150	30[2]	350[2]		
D 1841E	190 – 196	50[3]	210[3]	PC	Dispersion of pigments, reduction of viscosity
Copolyamide					
2A	120 – 130	600	18	TPU	Improvement of stability and pelletizing
D 1556A	130 – 140	500	21	PA	Dispersion of pigments and carbon black, reduction of viscosity
D 1566A	115 – 125	150	70	TPU	Improvement of stability and pelletizing
D 1662A	110 – 120	1300	8	TPE	

[1] 210 °C / 2.16 kg [2] 190 °C / 2.16 kg [3] 220 °C / 2.16 kg





Griltex for Apparel Interlining

Griltex is used for fusion of interlinings to various face fabrics to enhance garments guaranteeing dimensional stability, shape retention and durability.

Benefits

- Wide range of melting points and viscosities
- Broad variety of different powder fractions
- Solvent free
- High specific bonding strength
- High washing resistance
- Excellent dry cleaning resistance
- Adjustable steam activation

Added Value

- Low coating weight
- Soft hand

Applications

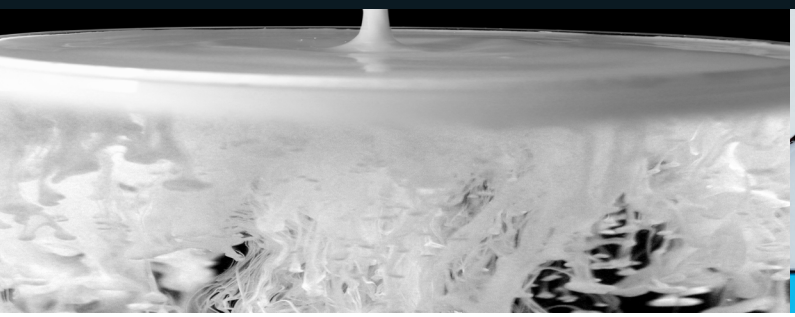
- Woven and nonwoven wear, knitted wear
- Women, men and children wear, work wear

Application Techniques

- Scatter coating
- Paste dot coating
- Double dot coating
- Powder dot coating
- Hotmelt coating
- Film / web coating

Griltex	Melting Range DSC [°C]	Melt Viscosity (160 °C / 2.16 kg) [Pa*s]	MVR [cm³/10']	Resistance Washing [°C]	Dry Cleaning	Steam
Copolyester						
6E	125 – 130	800	13	75	+	++
8E	110 – 115	750	14	60	+	+
9E	118 – 123	350	30	75	+	+
D 1309E	145 – 155	120[1]	90[1]	60	+	+
Copolyamide						
1A	105 – 115	650	16	60	++	+
2A	120 – 130	600	18	95	++	++
11A	105 – 115	500	20	60	++	–
D 1260A	105 – 120	250	45	60	++	++
D 1500A	85 – 95	150	70	60	++	+
D 1541A	115 – 125	170	60	60	++	++
D 1666A	75 – 85	120	90	40	++	–
D 1694A	110 – 120	150	70	60	++	++
D 1709A	110 – 120	190	55	60	++	– –
D 1796A	150 – 160	500[1]	20[1]	95	++	+
D 1834A	110 – 120	60	175	60	++	++
D 2155A	105 – 115	2500	4	60	++	–
D 2191A	110 – 125	800	13	60	++	+
D 2490A	115 – 122	200	53	60	++	– –

[1] 190 °C / 2.16 kg





Griltex Suspensions

Benefits and Properties

- Water based
- 40% solids by weight
- Average particle size < 1 µm
- Outstanding penetration into dense fabrics and yarns
- Compatible with standard dispersions
- Increase of chemical resistance
- Increase of impact resistance
- Suitable for thin layer coating

Applications and Added Value

- Label printing – to increase color fastness
- Transfer printing – to coat thin layers on release paper
- Bank notes – to improve anti soil finishing
- Apparel interlining – to improve bonding strength
- Carpets – to substitute latex precoating for fiber lock
- Additive for water based paint

Application Techniques

- Rotary screen printing
- Flat screen printing
- Spray coating
- Knife coating
- Roller coating

Griltex	Melting Range[1] DSC [°C]	Melt Viscosity (160 °C / 2.16 kg) [Pa*s]	MVR (160 °C / 2.16 kg) [cm³/10']	Lamination Temperature[1] [°C]	Solid Content [weight %]	pH Value	Particle Size d_{10} [µm]	Particle Size d_{50} [µm]	Particle Size d_{90} [µm]
Copolyester									
9E	118 – 123	350	30	120 – 150	40	5 – 9	0.6	0.8	1.1
Copolyamide									
2A	120 – 130	600	18	130 – 160	40	7 – 11	0.4	0.6	0.9
D 1500A	85 – 95	150	70	100 – 140	40	7 – 11	0.5	0.7	1.1

[1] Polymer values





Griltex Solubility

In general Griltex Copolyesters are not soluble in methanol and ethanol. Copolyamides do not dissolve in pure dichloromethane and other halogenated organosolvents.

Applications: Thin Layer Coating

Due to their solubility, these Griltex types are suitable for thin layer coating, e.g.

- Ultra–thin coatings
- Impregnation of yarns and ropes
- Transfer printing
- Electronic applications (e.g. wire coating)

Wire Coating

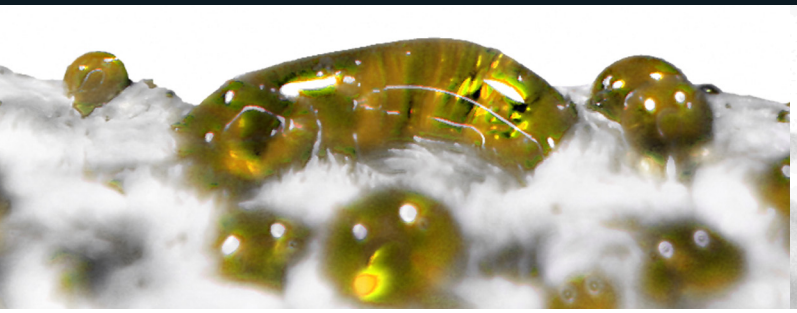
Griltex Copolyamides for wire coating provide the following properties:

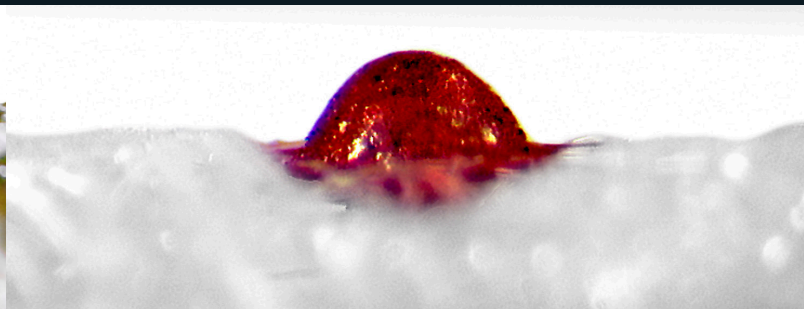
- Very low friction coefficient for faster winding
- Fast crystallization speed shortening the dwell time in the mould
- Low water absorption improving dimensional stability
- Excellent cohesion and adhesion strength for long component life
- Assorted melting temperatures to meet varied heat resistance requirements

Griltex	Melting Range DSC [°C]	Solubility at 50 °C				
		THF	Toluene	CH_2Cl_2	NMP	Cresol/ Xylene (1:1)
Copolyester						
6E	125 – 130	++	–	++	++	++
9E	118 – 123	++	–	++	++	++
D 1377E	150 – 160	+	–	++	++	++
D 1539E	118 – 126	++	–	++	++	++
D 1619E	115 – 120	++	+	++	++	++

Griltex	Melting Range DSC [°C]	Solubility at 50 °C				
		MeOH	EtOH	MeOH/ CH_2Cl_2 (1:1)	NMP	Cresol/ Xylene (1:1)
Copolyamide						
1A	105 – 115	+	++	++	+	++
2A	120 – 130	+	–	++	–	++
D 1500A	85 – 95	+	+	–	++	++
D 1523A	145 – 155	++	++	++	++	++
D 1541A	115 – 125	–	+	++	+	++
D 1556A	130 – 140	+	+	++	++	++
D 1709A	110 – 120	+	+	++	++	++

\+ Solubility: 5 – 10%
++ Solubility: >10%



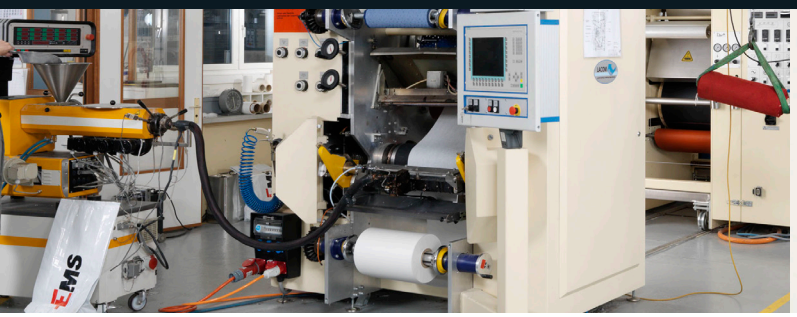


Application and Testing Capabilities

Powder Coating / Hotmelt Coating

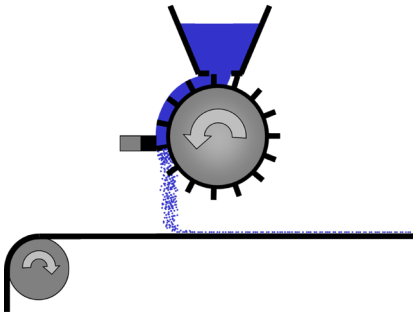
	Scatter Coating	Paste Dot Coating	Double Dot Coating	Foulard Process
Purpose	Random coating with Griltex powders	Coating of fabrics with water based dispersions	Coating of fabrics with water based dispersions followed by scatter coating	Suspension padded into fabric
Griltex grades	Powder fraction: P 82 P 1 – 5 P 2 – 5	Powder fraction: P 1	Powder fraction: Base dot: P 1 Top dot: P 82, P 0 – 160	Suspension
Max. working width [mm]	500 – 1000	500	500	350

	Slot Die Coating	Gravure Roller Coating			Multi Roller Coating	Extruder
Purpose	Hotmelt coating with closed or open surface structure	Hotmelt coating with engraved roller			Hotmelt coating with closed or open surface structure	Melting of granules
Griltex grades	Granules G F	Granules G F			Granules G F	
Gravure roller		CP 52	Net	Square dot		
Coating weight [g/m²]	10 – 200	12 – 20	10 – 25	15 – 80	5 – 400	
Max. working width [mm]	400	500			500	
Screw diameter [mm]						25
Screw length						25 D
Capacity [kg/h]						6

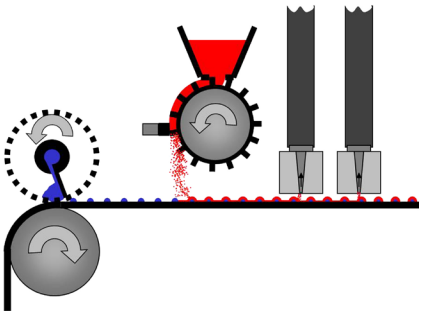




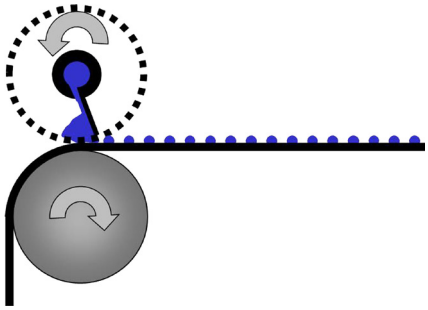
Scatter Coating



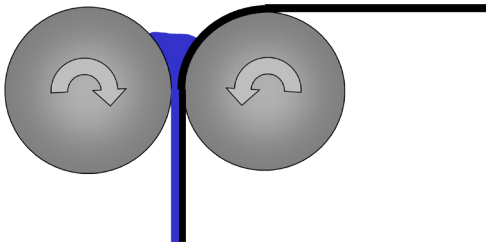
Double Dot Coating



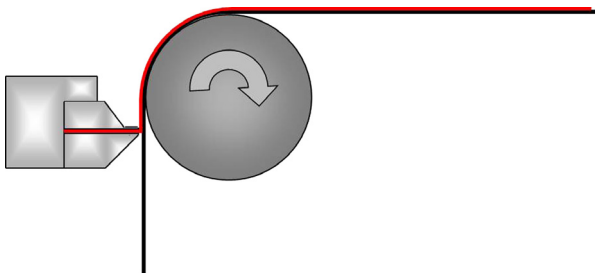
Paste Dot Coating



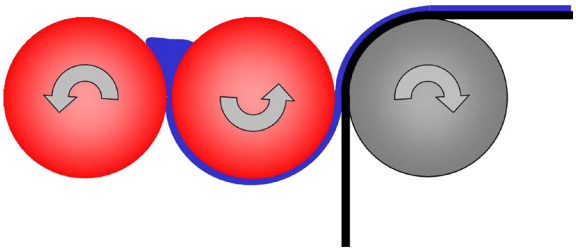
Foulard Process



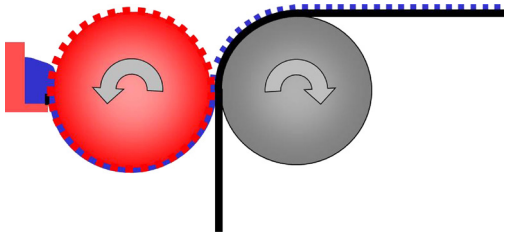
Slot Die Coating



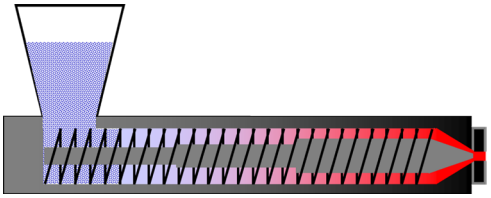
Multi Roller Coating



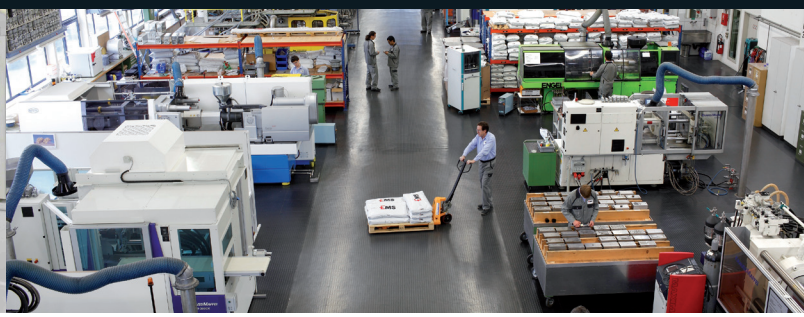
Gravure Roller Coating



Single Screw Extruder







Calender Lamination

	Nip Roll Calender			Calender Press
Purpose	Lamination of adhesive coated substrates with decorative fabrics			Lamination of two flexible fabrics by means of temperature and pressure
In combination with	Scatter line	Hotmelt line	Paste dot line	
Max. working width [mm]	1000	500	500	700
Laminating roll	steel / driven	steel / driven	steel	
Counter roll	steel / driven	rubber / driven	rubber / driven	

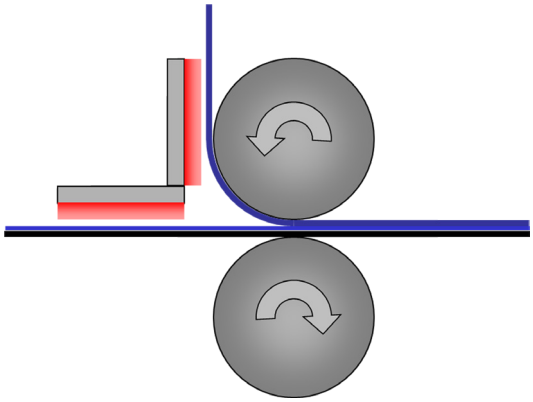
	Felt Calender	Ecosafe Line	Platen Press
Purpose	Lamination of backing and decorative fabrics	Lamination of backing and decorative fabrics	Lamination of rigid or flexible substrates
Temperature range [°C]	50 – 200	50 – 200	10 – 300
Max. working width [mm]	600	600	
Pressure range [bar]			0 – 250
Max. sample size [mm]			400 x 400

Application and Testing Capabilities

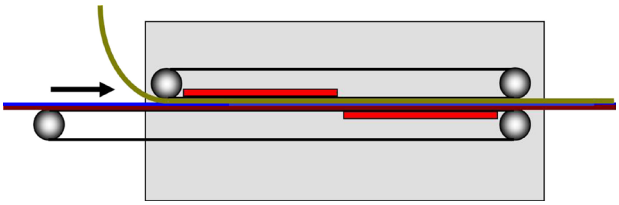




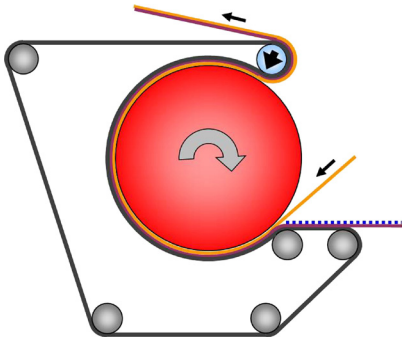
Nip Roll Calender



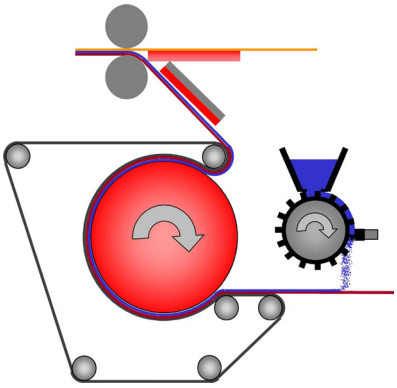
Calender Press



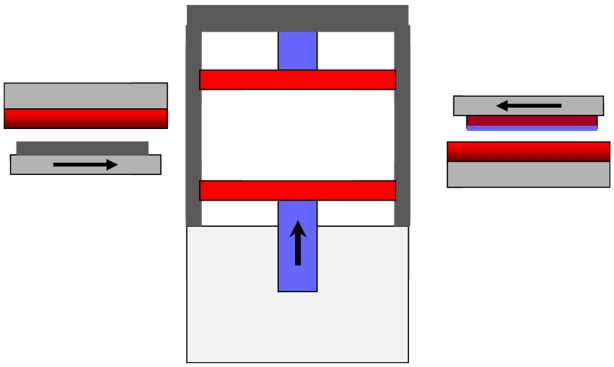
Felt Calender



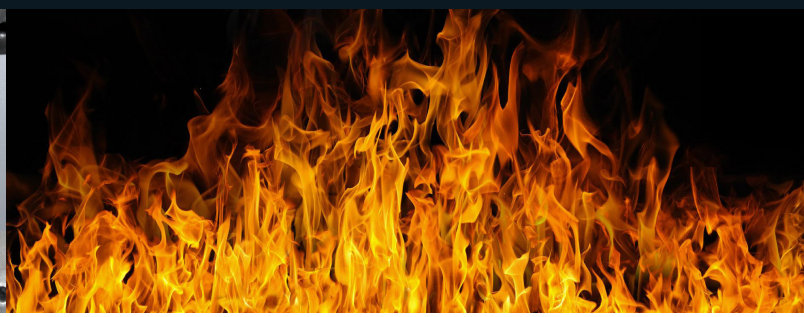
Ecosafe Line



Platen Press



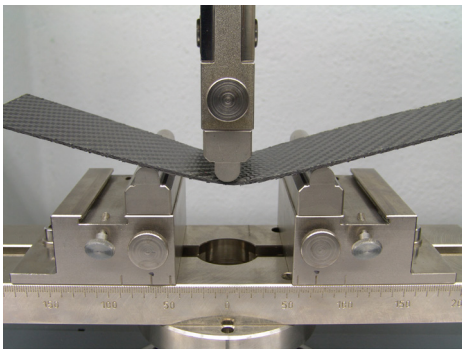




Analytical Capabilities

• DSC / TGA	ISO 11357
• Melt viscosity MVR	ISO 1133
• Solution viscosity	ISO 307
• Shear viscosity	ISO 6721–10
• Particle size analysis	EMS
• Density	ISO 1183–1
• Color LAB and YI	DIN 5033/6167
• Hydrolysis resistance	EMS
• Water absorption	ISO 62
• Fogging	DIN 75201
• Solubility	EMS
• Microscopy	EMS
• IR	ASTM E 1252
• Chromatography	
o GC/GC–MS/HPLC/AAS	
• Mechanical properties	
o Tensile–E–modulus	ISO 527–1
o Tensile strength	ISO 527
o Elongation	ISO 527
o Impact strength	ISO 179–1
o Shore hardness	ISO 868
o Dimensional stability under heat	ISO 75
o Dynamic mechanical analysis (DMA)	ISO 6721–5
o Peel strength	DIN 54310
o Compression after impact (CAI)	AITM 1.0010
o Interlaminar shear strength (ILSS)	ASTM D2344M





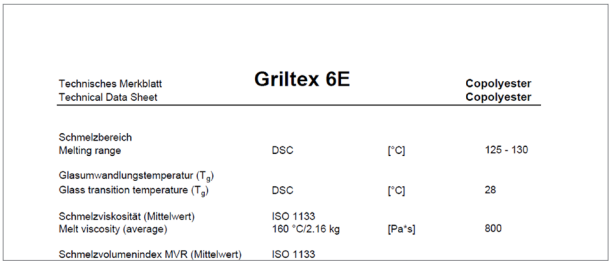




General Information about Griltex

1. TDS

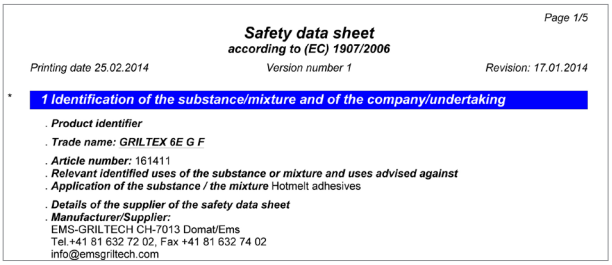
Technical Data Sheets contain detailed information about Griltex products and are available on our website. http://www.emsgriltech.com/TDS



Technisches Merkblatt Technical Data Sheet	Griltex 6E		Copolyester Copolyester
Schmelzbereich Melting range	DSC	[°C]	125 - 130
Glasumwandlungstemperatur (T_g) Glass transition temperature (T_g)	DSC	[°C]	28
Schmelzviskosität (Mittelwert) Melt viscosity (average)	ISO 1133 160 °C/2.16 kg	[Pa*s]	800
Schmelzvolumenindex MVR (Mittelwert)	ISO 1133		

2. MSDS

EMS-GRILTECH is committed to safety. Material Safety Data Sheets are available in different languages.



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Safety data sheet
according to (EC) 1907/2006

Printing date 25.02.2014 *Version number 1* *Revision: 17.01.2014*

1 Identification of the substance/mixture and of the company/undertaking

. **Product identifier**
. **Trade name: GRILTEX 6E G F**
. **Article number:** 161411
. **Relevant identified uses of the substance or mixture and uses advised against**
. **Application of the substance / the mixture** Hotmelt adhesives

. **Details of the supplier of the safety data sheet**
. **Manufacturer/Supplier:**
EMS-GRILTECH CH-7013 Domat/Ems
Tel.+41 81 632 72 02, Fax +41 81 632 74 02
info@emsgriltech.com

3. Shelf Life

Griltex polymers are chemically inert at moderate temperatures. We recommend to use the material within one year.



4. ISO – Certification

Being committed to quality, EMS-GRILTECH – including its headquarters in Domat/Ems (Switzerland) and production sites in Neumünster (Germany), Sumter (USA) and Hsin Chu Hsien (Taiwan) – is certified against ISO 9001 for a number of years.



SQS **Certificate**

SQS herewith certifies that the company named below has a management system which meets the requirements of the normative base specified below.

EMS-GRILTECH
a Business Unit of EMS-CHEMIE AG
CH-7013 Domat/Ems

Normative base

ISO 9001:2008 Quality Management System

Griltex Product Range

Griltex	Availability	Melting Range DSC [°C]	Glass Transition Temperature DSC [°C]	Melt Viscosity (160 °C / 2.16 kg) [Pa*s]	MVR (160 °C / 2.16 kg) [cm³/10']	Lamination Temperature Adhesive [°C]
Copolyester						
6E	G/P	125 – 130	28	800	13	140 – 170
8E	G/P	110 – 115	28	750	14	130 – 160
9E	G/P	118 – 123	19	350	30	120 – 150
D 1309E	G/P	145 – 155	8	120[1]	90[1]	160 – 180
D 1365E	G/P	98 – 107	18	450	23	120 – 140
D 1377E	G/P	150 – 160	25	300[1]	35[1]	170 – 200
D 1442E	G	105 – 115	3	700	15	120 – 150
D 1448E	G	100 – 107	15	500	21	120 – 150
D 1502E	G	180 – 190	–5	100[2]	105[2]	200 – 230
D 1519E	G	120 – 130	15	1200	9	140 – 170
D 1533E	G	140 – 150	8	30[1]	350[1]	150 – 160
D 1539E	G/P	118 – 126	19	100	105	120 – 140
D 1553E	G	85 – 95	–14	300	35	100 – 130
D 1595E	G	142 – 148	–12	40[1]	265[1]	150 – 160
D 1616E	G	85 – 95	–14	900	12	110 – 140
D 1619E	G	115 – 120	7	1100	10	140 – 170
D 1643E	G	120 – 130	12	420	25	130 – 160
D 1652E	G	80 – 85	–20	700	15	100 – 130
D 1655E	G	185 – 195	–12	50[2]	210[2]	200 – 230
D 1682E	G/P	118 – 123	19	350	30	120 – 150
D 1717E	G	180 – 190	–8	30[2]	350[2]	200 – 230
D 1765E	G	140 – 150	–15	80	130	160 – 170
D 1839E	G	138 – 148	–12	60	175	150 – 160
D 1841E	G	190 – 196	26	50[3]	210[3]	200 – 250
D 2132E	G/P	110 – 118	–11	320	33	110 – 140
D 2308E	G	114 – 122	11	300	35	130 – 160
D 2315E	G	110 – 118	–11	320	33	110 – 140
D 2368E	G	165 – 170	–1	250[1]	42[1]	170 – 200
D 2427E	G	50 – 90	–14	180	59	90 – 110
D 2500E	G	114 – 122	1	400	26	120 – 150

[1] 190 °C / 2.16 kg [2] 210 °C / 2.16 kg [3] 220 °C / 2.16 kg
G = Granules
P = Powder

This is the standard Griltex product range, other products are available on request.

Griltex ES and Griltex CE / CT are available in separate brochures "Griltex ES – Bonding of Even Surfaces" and "Griltex CE / CT for Composite Applications".

Griltex Product Range

Griltex	Availability	Melting Range DSC [°C]	Melt Viscosity (160 °C / 2.16 kg) [Pa*s]	MVR (160 °C / 2.16 kg) [cm³/10']	Lamination Temperature Adhesive [°C]
Copolyamide					
1A	G/P	105 – 115	650	16	130 – 160
2A	G/P	120 – 130	600	18	130 – 160
11A	G/P	105 – 115	500	20	120 – 150
D 1260A	P	105 – 120	250	45	120 – 150
D 1299A	G	112 – 118	120	90	110 – 130
D 1330A	G	125 – 135	1200[1]	9[1]	160 – 200
D 1500A	G/P	85 – 95	150	70	100 – 140
D 1523A	G/P	145 – 155	1000[1]	11[1]	170 – 200
D 1541A	G/P	115 – 125	170	60	110 – 150
D 1556A	G/P	130 – 140	500	21	140 – 170
D 1564A	G	105 – 115	650	16	130 – 160
D 1566A	G	115 – 125	150	70	110 – 150
D 1662A	G	110 – 120	1300	8	150 – 180
D 1666A	G/P	75 – 85	120	90	90 – 120
D 1694A	P	110 – 120	150	70	110 – 150
D 1709A	G/P	110 – 120	190	55	110 – 130
D 1796A	P	150 – 160	500[1]	20[1]	170 – 200
D 1834A	P	110 – 120	60	175	110 – 120
D 1858A	G	110 – 120	350	30	120 – 150
D 2155A	P	105 – 115	2500	4	140 – 170
D 2191A	P	110 – 125	800	13	120 – 160
D 2490A	G/P	115 – 122	200	53	120 – 140

[1] 190 °C / 2.16 kg
G = Granules
P = Powder

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EMS-GRILTECH worldwide
www.emsgriltech.com

EMS-GRILTECH is a Business Unit of EMS-CHEMIE AG, which belongs to the EMS-CHEMIE HOLDING AG (www.ems-group.com).

We manufacture and sell Grilon, Nexylon and Nexylene fibers, Griltex thermoplastic adhesives, Grilbond bonding agents, Primid cross linkers for powder coatings and Grilonit reactive diluents. We have developed these materials and additives into outstanding speciality products for technically demanding applications. In this way, we create added value for our customers as they can also enjoy success in their own markets only through continuous improvement.

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Issued: March 2014

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