

Technical Data Sheet EP GC				TDB-210	
Erhard Hippe KG Spremberg factory		Laminate Sheets		As of: 03.06.2002	Revision 2
<b>1. General information</b>					
This data sheet contains requirements for sheets made of technical laminates based on epoxy resins and different reinforcements.					
<b>2. Area of application</b>					
The properties mentioned in this data sheet are applicable only for the products manufactured in the Erhard Hippe KG and which have been marked as such.					
<b>3. Method of production</b>					
Sheets made of technical laminates based on curable resins, consisting of superimposed layers of fabric which have been completely impregnated with a curable resin and which have been put together by pressure and heat in such a way that they form a single piece.					
<b>4. Designation</b>					
Short name for resin, reinforcement material; serial number					
e.g.: EP GC 201; EP GC 202; EP GC 203; EP GC 204					
<b>5. Requirements</b>					
<b>5.1 General Requirements</b>					
The laminates have to be free of blisters, wrinkles and cracks and sufficiently free of defects such as scuffings, buckling and discolorations. A certain amount of stains is permitted. As for the evenness the test methods are laid down in IEC 893-2 and the requirements in IEC 893-3 table 3.					
<b>5.2 Thickness</b>					
The thickness tolerances correspond to the data in table 2 according to IEC 893-3.					
<b>Nominal Thickness</b>	<b>Tolerance ±</b>	<b>Nominal Thickness</b>	<b>Tolerance ±</b>	<b>Nominal Thickness</b>	<b>Tolerance ±</b>
0,4	0,10	3,0	0,37	20,0	1,30
0,5	0,12	4,0	0,45	25,0	1,50
0,6	0,13	5,0	0,52	30,0	1,70
0,8	0,16	6,0	0,60	35,0	1,95
1,0	0,18	8,0	0,72	40,0	2,10
1,2	0,20	10,0	0,82	45,0	2,30
1,6	0,24	12,0	0,94	50,0	2,45
2,0	0,28	14,0	1,02	60,0	2,45
2,5	0,33	16,0	1,12	70,0	2,45

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5.3 Types of those laminates described in this data sheet						
Resin	Reinforcement	IEC serial number	Application			
EP	GC	201	Mechanical, electrical and electronic applications. Extremely high mechanical strength at moderate temperature. Very good stability of electrical properties under high humidity.			
EP	GC	202	Similar to type 201. Of defined flammability.			
EP	GC	203	Similar to type 201. High mechanical strength at elevated temperature.			
EP	GC	204	Similar to type 203. Of defined flammability.			
EP: Epoxy resin GC: Woven glass cloth						
It should not be inferred from the descriptions given in the table that sheets of any particular type are necessarily unsuitable for application other than those listed for that type, or that specific sheets will be suitable for all applications within the wide descriptions given.						
Technical properties						
Property	Method	Unit	EP GC 201	EP GC 202	EP GC 203	EP GC 204
Flexural stress	5.1	MPa	340	340	340(1)	340(1)
Apparent modulus of elasticity in flexure	5.2	MPa	(24000)	(24000)	(24000)	(24000)
Compressive strength ⊥	5.3	MPa	(350)	(350)	(350)	(350)
Impact strength (Charpy)	5.5.2	kJ/m²	33	33	33	33
Shearing strength	5.6	MPa	(30)	(30)	(30)	(30)
Tensile strength	5.7	MPa	(300)	(300)	(300)	(300)
Electric strength at 90°C in oil perpendicular to laminations	6.1.2	kV/ mm 3 mm	10,2	10,2	10,2	10,2
Electric strength at 90°C in oil parallel to laminations	6.1.2	kV	35	35	35	35
Permittivity at 48 Hz - 62 Hz	6.2	-	5,5	5,5	5,5	5,5

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Property	Method	Unit	EP GC 201	EP GC 202	EP GC 203	EP GC 204
Permittivity at 1 MHz	6.2	-	5,5	5,5	5,5	5,5
Dissipation factor at 48 Hz - 62 Hz	6.2	-	0,04	0,04	0,04	0,04
Dissipation factor at 1 MHz	6.2	-	0,04	0,04	0,04	0,04
Insulation resistance after immersion in water	6.3	MOhm	5 x 10 <sup>4</sup>	5 x 10 <sup>4</sup>	5 x 10 <sup>4</sup>	5 x 10 <sup>4</sup>
Proof tracking index	6.4	-				
Comparative tracking index	6.4	-	(200)	(200)	(200)	(200)
Tracking and erosion resistance	6.5	Class				
Thermal endurance	7.1	T.I.	(130)	(155)	(155)	(155)
Flammability(*)	7.2	Category	-	VO	-	VO
Temperature of deflection under load	7.3	°C	in consultation			
Density	8.1	g/cm³	(1,7 - 1,9)	(1,7 - 1,9)	(1,7 - 1,9)	(1,7 - 1,9)
Water absorption	8.2	mg (2)	34	34	34	34
The values in parentheses ( ) are only for information. They are not to be considered specification values.						
(1) The flexural stress measured at (150+/-5)°C must not be less than 50% of the specified value.						
(2) Valid for testpiece 50x50x10mm.						
(*) The small-scale laboratory test used in this standard for assigning a flammability category is primarily for monitoring consistency of production of laminates. The results so obtained should not in any circumstances be considered as an overall indication of the potential fire hazards presented by these laminates under actual conditions of use.						