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APPENDICES

Appendix A The technical data of commercial material expected life time for 10 years (in normal condition)

Table A1 The technical data of PETG

Properties		Test methods (ASTM/ISO)	Condition
Tensile properties			
Tensile strength (MPa)	-	D-822	- At 25°C.
Modulus (MPa)	-	D-822	- Using speed at 50 mm/min
Optical properties			
Gloss retention (%)	-		- At 60°
Color difference (ΔE)	-	ASTM D 65	- At angle 45°
Temperature			
Brittleness temperature (°C)	-		- Storage in freezer at -35°C - Storage in oven at 50°C
Functional checking			
Each testing step	Pass	Modify ISO/IEC 24789-1*	
After finish testing	Pass	Modify ISO/IEC 24789-1*	
Chemical resistance (15 min/each solution)			
Salt	Good	ISO/IEC 10373-1	
Acid	Good		
Alkaline	Good		
Alcohol	Good		
Fuel B	Good		

Table A2 The technical data of PC-STD

Properties		Test methods (ASTM/ISO)	Condition
Tensile properties			
Tensile strength (MPa)	> 63.37	D-822	- At 25°C.
Modulus (MPa)	> 1047.26	D-822	- Using speed at 50 mm/min
Optical properties			
Gloss retention (%)	< 83.65		- At 60°
Color difference (ΔE)	< 4.77	ASTM D 65	- At angle 45°
Temperature			
Brittleness temperature (°C)	<- 35		- Storage in freezer at -35°C - Storage in oven at 50°C
Temperature range (°C)	-40 - 110		
Functional checking			
Each testing step	Pass	Modify ISO/IEC 24789-1*	
After finish testing	Pass	Modify ISO/IEC 24789-1*	
Warpage (mm)	< 0.80		
Chemical resistance (15 min/each solution)			
Salt	Good		
Acid	Good		
Alkaline	Good	ISO/IEC 10373-1	
Fuel B	Good		
Alcohol	Good		

Table A3 The technical data of PVC

Properties		Test methods (ASTM/ISO)	Condition
Tensile properties			
Tensile strength (MPa)	> 48.68	D-822	- At 25°C.
Modulus (MPa)	> 1065.80	D-822	- Using speed at 50 mm/min
Optical properties			
Gloss retention (%)	< 80.09		- At 60°
Color difference (ΔE)	< 9.03	ASTM D 65	- At angle 45°
Temperature			
Brittleness temperature (°C)	<- 35		- Storage in freezer at -35°C - Storage in oven at 50°C
Temperature range (°C)	-40 - 110		
Functional checking			
Each testing step	Pass	Modify ISO/IEC 24789-1*	
After finish testing	Pass	Modify ISO/IEC 24789-1*	
Warpage (mm)	< 0.93		
Chemical resistance (15 min/each solution)			
Salt	Good		
Acid	Good		
Alkaline	Good	ISO/IEC 10373-1	
Fuel B	Good		
Alcohol	Good		

Appendix B The technical data of new multi-layer material expected life time for 10 years (in normal condition)

Table B1 The technical data of PC-Teslin

Properties		Test methods (ASTM/ISO)	Condition
Tensile properties			
Tensile strength (MPa)	> 32.43	D-822	- At 25°C.
Modulus (MPa)	> 714.38	D-822	- Using speed at 50 mm/min
Optical properties			
Gloss retention (%)	< 78.61		- At 60°
Color difference (ΔE)	< 5.20	ASTM D 65	- At angle 45°
Temperature			
Brittleness temperature (°C)	<- 35		- Storage in freezer at -35°C - Storage in oven at 50°C
Temperature range (°C)	-40 - 110		
Functional checking			
Each testing step	Pass	Modify ISO/IEC 24789-1*	
After finish testing	Pass	Modify ISO/IEC 24789-1*	
Warpage (mm)	< 0.93		
Chemical resistance (15 min/each solution)			
Salt	Good		
Acid	Good		
Alkaline	Good	ISO/IEC 10373-1	
Fuel B	Good		
Alcohol	Poor		

Table B2 The technical data of PC-DDI

Properties		Test methods (ASTM/ISO)	Condition
Tensile properties			
Tensile strength (MPa)	> 63.68	D-822	- At 25°C.
Modulus (MPa)	> 1125.50	D-822	- Using speed at 50 mm/min
Optical properties			
Gloss retention (%)	< 88.48		- At 60°
Color difference (ΔE)	< 3.86	ASTM D 65	- At angle 45°
Temperature			
Brittleness temperature (°C)	<- 35		- Storage in freezer at -35°C - Storage in oven at 50°C
Temperature range (°C)	-40 - 110		
Functional checking			
Each testing step	Pass	Modify ISO/IEC 24789-1*	
After finish testing	Pass	Modify ISO/IEC 24789-1*	
Warpage (mm)	< 0.98		
Chemical resistance (15 min/each solution)			
Salt	Good		
Acid	Good		
Alkaline	Good	ISO/IEC 10373-1	
Fuel B	Good		
Alcohol	Good		

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