



Durable Goods Labelling Compliance

“ Durable goods require labels that give crucial instructions, product details and safety information. The labels have to stay in place and remain legible for the entire lifespan of an item - which can be a demanding labelling challenge. ”

Choosing a pre-tested and compliant labelling material means added reassurance for converters and a simpler and faster route to adoption for end users. This document summarises the commonly used standards and specifications for durable goods labelling, and shows a wide range of compliance-tested Avery Dennison materials. Please contact your sales representative if you need any additional information or further testing support.

The biggest subsegments in which common regulations and specifications apply are electronics & appliances and automotive.





Electronics & Appliances

UL AND C-UL

UL (formerly Underwriters Laboratories Inc.) is a US-based safety consulting company established in 1894. Goods and components to be sold in the US must be UL-recognised for safety. The company not only tests and certifies products in its laboratories, but also defines standards and writes specifications.



UL understands that safety-related labels are critical to the overall product safety. It sets out relevant requirements in the standard UL 969 ("Standard for Marking and Labeling Systems"). This focuses especially on the permanence of adhesion and legibility after different exposure conditions. Converters supplying labels for use with a UL-recognised product in the US must meet all relevant UL requirements.

In Canada, labels must comply with CSA standard 22.2 no. 0.15 ("Adhesive Labels"). UL also tests and recognises labels according to this standard, which are then C-UL recognised.

UL FOR CABLE LABELS

Whereas UL 969 is applicable only to labels on smooth and flat surfaces cables and wire labelling is evaluated against different UL standards, and Avery Dennison offers materials that comply with the following standards:

- > UL 817 – cord sets and power supply cords
- > UL 2238 – cable assemblies and fittings for industrial control and signal distribution



CHEMICAL RUB TEST OF PRINTED LABELS

A marking durability rub test is often needed for labels on electronic and electrical goods. A visual examination assesses the label's legibility and adhesion after rubbing the labels with a cloth that has been soaked in any of a variety of liquid(s) including petroleum spirit (hexane), water, methylated spirit (ethyl alcohol denatured with methanol) and isopropyl alcohol. The liquid and rubbing duration will vary by standard (for example VDE 0711, ICE 60335-1, IEC 60950-1 and DIN 75302).

Avery Dennison has tested printed samples according to the widely used specification ICE 60335-1 (7.14). This involves rubbing a label for 15 seconds with a cloth soaked in water, drying, and then rubbing for 15 seconds with a cloth soaked in n-hexane.

Electrical medical equipment labels are tested for chemical resistance according to IEC 60601-1. This involves rubbing printed samples for 15 seconds with a cloth soaked with water, followed by 15 seconds with methylated spirit and finally 15 seconds with IPA.

The table at the end of this document shows test results for thermal transfer printed labels, printed with commonly used TT ribbons. Details can be obtained from your Avery Dennison sales representative.



Automotive

FMVSS 302 - FLAMMABILITY-TESTING STANDARD

Federal Motor Vehicle Safety Standards (FMVSS) are US federal regulations. Standard FMVSS 302 relates to the burning behaviour of materials used inside road vehicles such as passenger cars, trucks, buses and agriculture machinery. It was developed to help reduce deaths and injuries to occupants caused by vehicle fires, especially from discarded cigarettes and matches. Most automotive OEMs specify flammability testing based on FMVSS 302 and technically equivalent OEM standards.

The test sample is held horizontally in a U-shaped holder and exposed to a flame for 15 seconds in a combustion chamber, in order to see if/when the flame extinguishes, or the time taken for the flame to pass a defined distance. The burning rate per minute is then calculated. For most automotive applications, a burning rate of no more than 100 mm/min is acceptable, although some vehicle manufacturers have tightened the requirements. Some label materials burn at a rate < 100 mm/min when tested on their own. Standard polyester label materials were found to be compliant when applied to a panel made of slow burning plastic as used in the automotive industry.



AUTOMOTIVE SPECIFICATIONS

Automotive OEMs, but also tier suppliers, describe their technical requirements for self adhesive labels in dedicated specifications. The main test criteria are peel adhesion forces after defined storage conditions - usually to be tested on the original substrate - and the resistance of printed labels against chemicals and abrasion.

Avery Dennison regularly tests label materials against automotive specifications - during the development of new materials, but also application-specific. The table indicates which materials have passed automotive specification testing regarding peel adhesion after exposure to defined environmental conditions (including heat, cold, temperature cycles and humidity ageing) on standard laboratory panels. For further information or specific test results please contact your Avery Dennison sales representative.



OVERVIEW OF COMPLIANT DURABLE LABEL MATERIALS

The tables below show only positive test results. An empty cell does not always imply that a material is not compliant, but may simply mean that it has not been tested. Further information is available on request.

Gloss white Polyester Materials		Code	UL indoor	UL outdoor	c-UL indoor	c-UL outdoor	UL for cables	Chemical rub test ICE 60385-1	Chemical rub test IEC 60601-1 FMVSS 302	Automotive Specifications	
Transfer PET white PT16 / S8007 / BG40wh		BD843	✓	✓							Good
Transfer PET white PT / S8020 / BG42wh		AA639	✓				✓	✓			Better
Transfer PET white TOP / S8020 / BG42wh		AA641	✓	✓	✓		✓	✓			
Transfer PET white PT / S8001 / BG42wh		AF029	✓	✓	✓	✓	✓	✓			Better
Transfer PET white TOP / S8001 / BG42wh		AF031	✓	✓	✓	✓	✓	✓			
Transfer PET white PT / S8030 / BG42wh		AD225	✓				✓	✓			Best
Transfer PET white TOP / S8030 / BG42wh		AD222	✓		✓		✓	✓			
Transfer PET white PT / AL170 / BG42wh		AA640	✓				✓	✓			Best
Transfer PET white TOP / AL170 / BG42wh		AA642	✓	✓			✓	✓	🔥	M	
Transfer PET white PT / S8015 / BG42wh		AA668	✓				✓	✓			
Transfer PET white TOP / S8015 / BG42wh		AA670	✓	✓	✓	✓	✓	✓	🔥	M H	
Transfer PET white TOP / S8049 / BG42wh BSS\		AJ059	✓	✓	✓	✓	✓	✓	🔥	M H L	
Matt white Polyester Materials		Code	UL indoor	UL outdoor	c-UL indoor	c-UL outdoor	UL for cables	Chemical rub test ICE 60385-1	Chemical rub test IEC 60601-1 FMVSS 302	Automotive Specifications	
Transfer PET matt white / S8020 / BG42wh		AA643	✓	✓							Good
Transfer PET matt white TC6 / S8001 / BG42wh		AF030	✓	✓	✓	✓	✓	✓	🔥		Better
Transfer PET matt white TC6 / S8030 / BG42wh		AN754	✓		✓		✓	✓			
Transfer PET matt white / S8030 / BG42wh		AD223	✓		✓		✓	✓			Best
Transfer PET matt white / AL170 / BG42wh		AA145	✓	✓	✓		✓	✓	🔥	M	
Transfer PET 75 Matt White / AL170 / BG42wh		AI397	✓		✓		✓	✓		M	
Transfer PET matt white / S8015 / BG42wh		AA672	✓	✓			✓	✓		M H	
Transfer PET 75 Matt White / S8015 / BG42wh		AI399	✓		✓		✓	✓		M H	
Transfer PET matt white / S8049 / BG42wh BSS		AL854	✓	✓	✓	✓	✓	✓		M H L	
Transfer PET 75 Matt White / S8049 / BG42wh BSS		AL851	✓	✓	✓	✓	✓	✓		M H L	
Chrome Polyester Materials		Code	UL indoor	UL outdoor	c-UL indoor	c-UL outdoor	UL for cables	Chemical rub test ICE 60385-1	Chemical rub test IEC 60601-1 FMVSS 302	Automotive Specifications	
Transfer PET bright chrome TOP / S8030 / BG42wh		AE366	✓		✓		✓	✓			Good
Transfer PET matt chrome PT12 / S8007 / BG40wh		AP062	✓								
Transfer PET matt chrome TOP / S8020 / BG42wh		AA644	✓	✓			✓	✓			Better
Transfer PET matt chrome TOP / S8001 / BG42wh		AF032	✓	✓	✓	✓	✓	✓	🔥		
Transfer PET matt chrome TOP / S8030 / BG42wh		AD221	✓		✓		✓	✓	🔥		Best
Transfer PET matt chrome TOP / AL170 / BG42wh		AA645	✓	✓	✓		✓	✓		M	
Transfer PET matt chrome TOP / S8015 / BG42wh		AA674	✓	✓	✓	✓	✓	✓		M H	
Transfer PET matt chrome TOP/S8049/BG42wh BSS		AL852	✓	✓	✓	✓	✓	✓		M H L	

Good / Better / Best is a relative comparison of overall performance within the Avery Dennison Durables product range

- 🔥 Flame-retardant when applied to a plastic panel
- 🔥 Flame-retardant material (on its own)
- H High surface energy plastics
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		UL indoor	UL outdoor	c-UL indoor	c-UL outdoor	UL for cables	Chemical rub test IEC 60385-1	Chemical rub test IEC 60601-1	FMVSS 302	Automotive Specifications	
Silver Polyester Materials											
Transfer PET matt silver / S8020 / BG42wh	AA646	✓	✓			✓	✓				Good
Transfer PET matt silver / S8030 / BG42wh	AD224	✓				✓	✓				Better
Transfer PET matt silver / AL170 / BG42wh	AA146	✓	✓	✓		✓	✓	🔥		M	Best
Transfer PET 75 Matt Silver / AL170 / BG42wh	AI398	✓		✓		✓	✓			M	
Transfer PET matt silver / S8015 / BG42wh	AA676	✓	✓			✓	✓			M H	
Transfer PET 75 Matt Silver / S8015 / BG42wh	AI400	✓		✓		✓	✓			M H	
Transfer PET matt silver / S8049 / BG42wh BSS	AJ060	✓	✓	✓	✓	✓	✓			M H L	
Transfer PET 75 Matt Silver / S8049 / BG42wh BSS	AL850	✓	✓	✓	✓	✓	✓			M H L	
Transparent Polyester Materials											
Transfer PET Trans TOP / S8020 / BG42wh	AC397	✓	✓			✓	✓				Good
Transfer PET Trans TOP / S8001 / BG42wh	BE014	✓	✓			✓	✓				Better
Transfer PET Trans TOP / S8030 / BG42wh	AD220	✓	✓	✓	✓	✓	✓				Best
Transfer PET Trans TOP / AL170 / BG42wh	AC393	✓	✓			✓	✓			M	
Overlamination Films											
Overlaminating PET 25 / S8020 / BG42wh	AE407	✓		✓							Glossy
Overlaminating PET 25 / AL170 / HF80	AA647	✓									
Overlam PET 23 UV / S8020 / PET23	AS675	✓	✓	✓	✓						Matt
Overlam PET 23 UV / AL170 / PET23	AS674	✓	✓	✓	✓						
Overlam PET 25 Matt Trans / AL170 / HF80	AC747	✓	✓								
Overlam PET 25 Matt Trans / AL170 / HF100	BF482	✓	✓								
Overlam Polycarb 50 Matt / S8020 / PET36	AB702	✓									
PVC Products for extra outdoor durability											
PVC outdoor white / AL170 / BG42wh	AA648	✓	✓			✓		🔥			Good
PVC outdoor matt white / AL170 / BG42wh	AA948	✓	✓			✓		🔥			
PVC outdoor clear / AL170 / BG42wh	AS880	✓	✓	✓	✓	✓		🔥			
PVC outdoor matt clear / AL170 / BG42wh	AW627	✓				✓		🔥			
PVC outdoor yellow / AL170	AE492							🔥			
Transfer PVC 50 Cast White / S8065 / BG50wh	AE357	✓	✓	✓	✓			🔥			Better
Transfer PVC 50 Cast Silver / S8065 / BG50wh	AE416	✓	✓	✓	✓			🔥			
Transfer PVC 50 Cast Clear / S8065 / BG50wh	AI995					✓		🔥			
Transfer PVC 50 Cast Yellow / S8065 / BG50wh	AE359	✓	✓	✓	✓			🔥			

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Polyimide films		Code	UL indoor	UL outdoor	c-UL indoor	c-UL outdoor	UL for cables	Chemical rub test ICE 60385-1	Chemical rub test IEC 60601-1	FMVSS 302	Automotive Specifications
Polyimide I GL WH TC13 / S8088 / BG50wh		BC668	✓								
Polyimide I Wh TC14 / S8088 / BG50wh		BB810	✓								
Polyimide II Wh TC14 / S8088 / BG50wh		BC133	✓								
Polyimide I Matt White / S8088 / 50#SCK		AI300	✓		✓						
Polyimide II Matt White / S8088 / 50#SCK		AH415	✓		✓						
Other Products		Code	UL indoor	UL outdoor	c-UL indoor	c-UL outdoor	UL for cables	Chemical rub test ICE 60385-1	Chemical rub test IEC 60601-1	FMVSS 302	Automotive Specifications
Transfer PO White / S8020 / BG42wh		BF481	✓	✓						🔥	
Transfer PO Clear / S8020 / BG42wh		BF483	✓	✓						🔥	
Transfer PP TR 75 Matt White / S8020 / BG42wh		AC463	✓				✓				
Transfer PP TR 75 Matt White / S8001 / BG42wh		AJ095	✓				✓				
Transfer PET white CR / S8015 / BG42wh		BB815	✓	✓							H M
Transfer PET silver CR / S8015 / BG42wh		AZ348	✓	✓							H M
ESD PET White TOP / S8087 / BG55wh		AU978	✓	✓							
Transfer PET 36 White TOP / S8092 / PET75		AS191									
PET void check matt chrome / S8015 / BG42wh		AB048	✓	✓	✓						H M
PVC Semi Gloss White UD / S2000N / BG50wh		AZ426	✓	✓	✓	✓					
PVC Semi Gloss White UD / S690 / BG50wh		AW451	✓	✓	✓	✓					
Transfer Tape BG50Wh / S8049 / BG50WH BSS		AO530									

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WARRANTY:

The information in this document is based on test results, and represents our best understanding of compliance requirements. While this summary can help with the selection of durable goods labelling materials, the final responsibility for testing under real-world conditions rests with the converter or end user.

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