

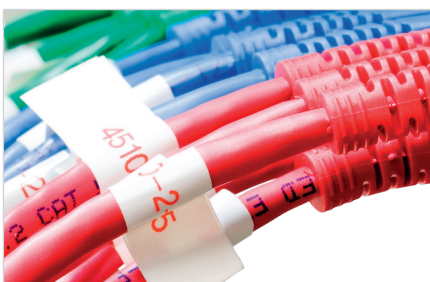


# Durable Goods Labelling Compliance

“ 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.



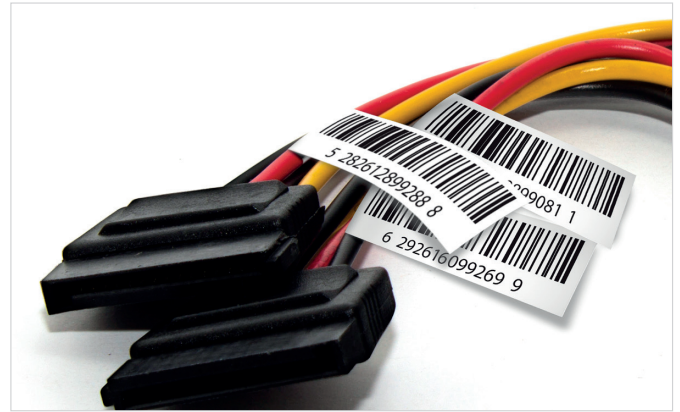
UL understands that safety-related labels are critical to the overall product safety. It sets out relevant requirements in the standard UL 969 ("Standard for Marking and Labeling Systems"). This focuses especially on the permanence of adhesion and legibility after different exposure conditions. Converters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

		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		
<b>Gloss white Polyester Materials</b>												
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 / S8002 / BG42wh	BL805	✓	✓	✓	✓	✓	✓				Better	
Transfer PET white TOP / S8002 / BG42wh	BJ330	✓	✓	✓	✓	✓	✓					
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 / S8029 / BG45wh	BN947	✓	✓	✓	✓	✓	✓		M H L			
Transfer PET white TOP / S8049 / BG42wh BSS	AJ059	✓	✓	✓	✓	✓	✓	🔥	M H L			
<b>Matt white Polyester Materials</b>												
Transfer PET matt white / S8020 / BG42wh	AA643	✓	✓									Good
Transfer PET matt white TC6 / S8002 / BG42wh	BL802	✓	✓	✓	✓	✓	✓	🔥				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 / S8029 / BG45wh	BN949	✓	✓	✓	✓	✓	✓		M H L			
Transfer PET matt white / S8049 / BG42wh BSS	AL854	✓	✓	✓	✓	✓	✓		M H L			
Transfer PET 75 Matt White / S8049 / BG42wh BSS	AL851	✓	✓	✓	✓	✓	✓		M H L			
<b>Chrome Polyester Materials</b>												
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 / S8002 / BG42wh	BL799	✓	✓	✓	✓	✓	✓	🔥				
Transfer PET matt chrome TOP / S8030 / BG42wh	AD221	✓		✓		✓	✓	🔥				
Transfer PET matt chrome TOP / AL170 / BG42wh	AA645	✓	✓	✓		✓	✓		M		Best	
Transfer PET matt chrome TOP / S8015 / BG42wh	AA674	✓	✓	✓	✓	✓	✓		M H			
Transfer PET matt chrome TOP / S8029 / BG45wh	BH781	✓	✓	✓	✓	✓	✓		M H L			
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
- L Low surface energy plastics
- M Metals and some lacquers





		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	
<b>Silver Polyester Materials</b>										
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 / S8029 / BG45wh	BN950	✓	✓	✓	✓	✓	✓		M H L	
Transfer PET matt silver / S8049 / BG42wh BSS	AJ060	✓	✓	✓	✓	✓	✓		M H L	
Transfer PET 75 Matt Silver / S8049 / BG42wh BSS	AL850	✓	✓	✓	✓	✓	✓		M H L	
<b>Transparent Polyester Materials</b>										
Transfer PET Trans TOP / S8020 / BG42wh	AC397	✓	✓			✓	✓			Good
Transfer PET Trans TOP / S8002 / BG42wh	BL806	✓	✓			✓	✓			Better
Transfer PET Trans TOP / S8030 / BG42wh	AD220	✓	✓	✓	✓	✓	✓			Best
Transfer PET Trans TOP / AL170 / BG42wh	AC393	✓	✓			✓	✓		M	
<b>Overlamination Films</b>										
Overlaminating PET 25 / S8020 / BG42wh	AE407	✓		✓						Glossy
Overlaminating PET 25 / AL170 / HF80	AA647	✓								
Overlam PET 23 UV / S8020 / PET23	AS675	✓	✓	✓	✓					
Overlam PET 23 UV / AL170 / PET23	AS674	✓	✓	✓	✓					
Overlam PET 25 Matt Trans / AL170 / HF80	AC747	✓	✓							Matt
Overlam PET 25 Matt Trans / AL170 / HF100	BF482	✓	✓							
Overlam Polycarb 50 Matt / S8020 / PET36	AB702	✓								
<b>PVC Products for extra outdoor durability</b>										
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											
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 / S8002 / BG42wh	BN104	✓					✓				
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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