

PLANNING AIDS with example in the context of the product description of cable assemblies according to ZPFW2 (USA) & ZPFW8 (Canada)

Since January 2010 the demand for cable with the label «WIRING HARNESSSES» has increased considerably. The service provider «Underwriters Laboratories Inc.» analyses if products, components, materials and systems comply with specific requirements. If so the products are allowed to be provided with the UL-label – as long as they comply with the required standards which have to undergo 4 additional audits per year.

Our certification by Underwriters Laboratories Inc. refer to the following ranges: Printed circuit boards according to the ZPMV2 standard with UL-File No.: **E328445** and Cable assembly according to ZPFW2 and ZPFW8 standard for USA and Canada with UL-File No.: **E334300**.

As to the range of cable assembly you will receive a small project schedule with explanations and corresponding proceedings which, as our customer, shall help you to meet and to understand the UL-standards. Aim of the UL-certification: Underwriters Laboratories Inc. evaluates wire and cable products of more than 70 different product ranges based on more than 30 safety standards. The complete audit programs of the UL comprise **safety, demand, quality control, unheralded follow-up inspections** in the factories and **follow-up tests** at the Underwriters Laboratories.

The UL inspections support consumers, designers, suppliers and manufacturers to identify wiring products complying with public accredited safety standards as well as with industrial standards for demands and quality. Operators rely on the safety of products with UL-labels.

Scheduling for the labeling of products with UL-certificates: as our customer you will let us know which parts are concerned and which UL-standards have to be met by the product. The complexity in this context might be different and will be carried out according to our customer's requirements. At this point the most frequent problems occur. Information like: «*all parts have to be UL registered, audited and labeled*» are theoretically and practically incorrect and will not be accepted by the Underwriters Laboratories. Applied performance for the labeling of products with an UL-certificate: Each company has to be supervised and supported by an UL-certifier until the completion of the device. The certifier and the consumer define the required features which have to comply with the UL-standards.

These standards have to be explicitly displayed in the drawing! The corresponding drawing will be provided to us for the cable assembling. The certification and labeling will be eased by a more general description. The features of the individual components are classified in different categories. Here some examples:

Plastic connector 94V0; 94V1
Cable: VW1; 1007; 1061; 1561; 20276

If you indicate a connector in your drawing the way you do it will result in different responses by us and thus also in different prices.

Example 1: You require a terminal connector for a main board connector. The data sheet of the manufacturer indicates a precise part number 39-01-2000. In this case the manufacturer is Molex.

Marking in your drawing: **ST1, 39-01-2000, Molex, Molex tool 17622-22**

Reaction at ES&S: we are committed by the UL-standards to process **this specific connector** and no alternatively available version and to use the indicated tool for its production! As you can easily imagine, in this particular case, ES&S would have to buy this Molex tool 17622-22 due to the explicitly indicated tooling specification. Consequently we have to take tooling costs into account as to our calculations which would cause a considerable increase in our prices.

Example 2:

Marking in your drawing: **ST1, 20 x 2-pin, female, pitch 3.96 mm UL94V-0.**

This definition in the drawing means: ES&S can decide which connector will be utilized. After a consultation with you the Molex connector or a connector of another manufacturer can be selected. In this case it is significant that the manufacturer processes the part according to the UL-standard UL94V-0. We ensure that alternative manufacturers process according to the UL-standards. As to an UL re-auditing we will provide evidence which connector from which manufacturer with a certification has been utilized.

Example 3: The best solution is a mix of the examples 1 and 2. Since, as a customer, you do not want to provide two drawings the proceed-

ings should be made as follows:

Marking (identification) in your drawing:
ST1, 20x2-pin, female pitch 3.96 mm UL94V-0, Molex 39-01-2000 or identical.

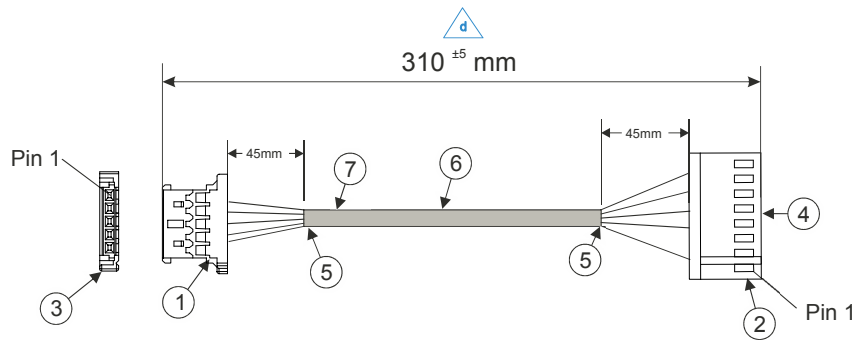
This definition in the drawing will be less complicated and more precise for both sides:

The selection of the connector will be left to us. We will decide on the Molex connector or a connector of a different manufacturer **without any consultation with you**. It is also in this case significant that the manufacturer produces the part according to the UL-standard UL94V-0! We guarantee that different alternative manufacturers produce according to the UL-standard. We will also proof as to an UL re-auditing which connector and which manufacturer with a certification have been utilized respectively chosen. This also refers to cables and shrink hoses: less information will be helpful. Whenever the drawing has precise identifications, ES&S is obliged to use exactly this material for the assembly. This might be very crucial as to a low availability of the indicated materials. ES&S then has **NO** option. The customer would also have to face another re-certification of the final product by the UL in case of bankruptcy of the explicitly indicated manufacturer or a discontinuation of the product.

Processed materials **WITHOUT** UL-standards might also be indicated in the drawing. These materials will **NOT** be controlled by us according to UL. Then the customer has to provide evidence towards the UL.

Special attention has to be paid to cable assemblies which are manufactured in large packing units (e.g. cable bobbins). A reach or section must be labeled with a so-called «RESPOOL» sticker since otherwise the UL standards concerning the traceability of products would be infringed.

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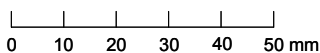
Production note:
- cable production according to ul-standard ZPFW2

No.	quantity	name	manufacturer/type	order number	type*	UL*
1	1	plug housing, 5 pole cable (female)	E&T, Molex	3808K-F05N-02R, 51146-0500	no	no
2	1	plug housing, 5 pole cable (female)	AMP	171822-8	no	no
3	4	crimp, socket	E&T, Molex	H208K-P05N-02B, 50641-8041	no	no
4	4	crimp, socket	AMP/TYCO	170263-1	no	no
5	2	heat-shrink tubing length 25 mm	exempted		no	no
6	1	Durable!!! labelling «Art.No.-Index»	exempted		no	no
7	1	round cables!!!, shielded 4 strands, AWG28 UL-certified (AVLV2), min. 30V, min. 80 °C	exempted		no	yes

* mandatory field

X1 (Display)	Funktion	X2
1	VCC-12V	4
2	GND	3
3	Bl. On/Off	6
4	PWM	5
5	NC	-

*) scale: 1:1



Projection method: ISO 5456-2		general tolerance ISO 2768-mK		Kanten ISO 13715	scale: *)	(weight)
		date 19.12.12		name	material/ material density:	
		checked 15.10.15			name: Backlightkabel_G185XW01_AUO	
		approved 15.10.15			drawing-no.:	
d	798.60/0023	15.10.15			Blatt 1	
c	798.60/0002	27.03.13			v.: 1	
b	798.60/0001	31.01.13			material-No.:	
Zust.	modification	date	name		CAD-file:	