



Safety Measures ^{ELECTRICAL}

“Elimination is the first priority!
Ensure a risk assessment is completed before energized work tasks are completed.”

Compliant Arc Flash & Shock Equipment Labels

By Terry Becker, P.Eng., CEM, IEEE Senior Member

The CSA Z462 Workplace electrical safety Standard published its 2021, 5th Edition on January 5, 2021. CSA Z462 has been adopted across all industry sectors from Victoria to Corner Brook. Even companies that fall under CSA Z462, Clause 1 Scope, Clause 1.2 Application and specifically are indicated that the CSA Z462 Standard doesn't apply to their industry (e.g., marine, telecommunications, railway, and electrical utilities) are using CSA Z462 where it does apply to their facilities.

In the last ten (10) years with the CSA Z462 requirement for a Qualified Person to complete and document an Arc

Flash Risk Assessment for energized electrical work tasks, P.Eng. Electrical Engineering consultants have been contracted to complete detailed arc flash hazard incident energy analysis studies based on the IEEE 1584 Guide for Performing Arc-Flash Hazard calculations.

The outcome of the P.Eng. authenticated arc flash study report issued is the provision of detailed arc flash & shock equipment labels that are then installed on the electrical equipment for which the incident energy calculations were completed.

The Qualified Person then references the arc flash incident

energy calculated at the assumed working distance and the arc flash boundary distance to determine “additional protective measures” to apply to reduce risk related to an energized electrical work task they will perform.

The problem historically that has occurred and is applicable to hundreds of thousands of detailed arc flash and shock equipment labels installed is the equipment label specification and information presented is NOT compliant. The specific information that will be presented that is not compliant is:

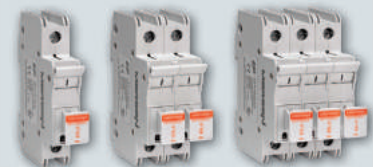
1. Signal pane colour and signal pane word used do not comply to the intent of ANSI Z535.
2. The Signal Pane “Danger” was used for all arc flash & shock equipment labels installed no matter what the incident energy value was.
3. Wrong colour used in the Signal Pane.
4. Text descriptions used are not consistent with CSA Z462 Clause 3 Definitions e.g., flash hazard boundary, the working distance is not listed as working distance).
5. The equipment label includes a detailed list of arc flash PPE.
6. The equipment label indicated arc flash PPE with a: HRC #, CAT #, Level “letter,” or Level “number, 1, 2, 3, 4, 5.”
7. The footer of the equipment label is not complete.
8. The footer of the equipment label doesn’t include the specific electrical protective device ID that the incident energy calculation was based on.
9. The footer of the equipment label doesn’t indicate the location on the electrical equipment where the incident energy applies e.g., load or line side of indicated electrical protective device or the bus.
10. The size of the equipment label is too small and illegible.
11. The information was printed on an equipment label that is paper based or not appropriate for placement on electrical equipment in an indoor or outdoor environment.
12. The equipment label wrongly indicates “Dangerous – No PPE Exists” when the calculated incident energy is greater than 40.0 cal/cm2. This myth was created by the lack of knowledge of P.Eng. Electrical Engineers that potential arc blast pressure released from expansion of air at the point of the abnormal arcing fault correlated to incident energy when it correlates to abnormal arcing fault current and worker distance from the abnormal arcing fault location in the electrical equipment. Issued reports also include errors & omissions with respect to interpretation of IEEE 1584 parameter selection.



MERSEN'S COMPACT FUSED SWITCH

Mersen's Compact Fused Switch incorporates switch functionality with the high protection level of a fuse. It has a smaller footprint compared to a traditional Class CC disconnect with an interrupt rating of 200kA. The compact form factor and ease of installation make it a great choice for panel builders.

- Accepts class CC fuses
- CSA C22.2 No.4 - enclosed and deadfront switches
- UL 98 listed
- Suitable for branch circuit disconnect and protection
- Built-in lockout/tagout feature



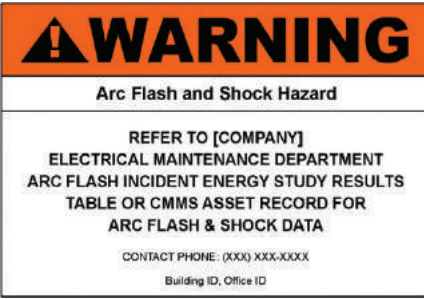


Figure 6.

be applied when the calculated incident energy exceeds 140.0 cal/cm². Oberon Company has available their Arc140 Arc Flash Suit that has an Arc Thermal Performance Value (ATPV) or 140.0 cal/cm².

Lastly the Figure 6 equipment label complies with the requirement for a minimum Warning Label as per the CE Code Part I, Rule 2-306, but references that arc flash data can be obtained from the “Results Table” of the P.Eng. authenticated arc flash study report. This provides not only the arc flash data but calculated short circuit data and calculated arcing fault data. The “Results

Table” can be provided to your employees and third-party contractors directly and proactively via PDF file. The information is readily available digitally but can also be printed and posted on the electrical equipment it applies to. This also saves thousands of dollars related to printing and installing individual arc flash & shock equipment labels.

If you are interested and need more information with respect to interpretation and the correct application of the IEEE 1584 2018 Edition please reference three

previous articles published in Electrical Line Magazine, Electrical Safety Measures: March/April 2019, May/June 2019, and November/December 2019.

Ensuring that arc flash & shock equipment labels are compliant will ensure that Qualified Electrical Workers correctly interpret the information presented, correctly document their work task’s arc flash risk assessment and shock risk assessment and don appropriate arc flash and shock PPE validating their residual risk is acceptable.



Terry Becker, P.Eng, CESP, IEEE Senior Member is the first past Vice-Chair of the CSA Z462 Workplace electrical safety Standard Technical Committee and currently a Voting Member and Working Group Leader for Clause 4.1 and the Annexes. Terry is also a Voting Member on the CSA Z463 Maintenance of electrical systems Standard and a Voting Member of the IEEE 1584 Guide for Performing Arc-Flash Hazard Calculations. Terry has presented at Conferences and Workshops on electrical safety in Canada, the USA,

India and Australia. Terry is a Professional Engineer in the Provinces of BC, AB, SK, MN and ON. Terry is an Electrical Safety Specialist, Management Consultant, and can be reached at 587.433.3777 or by email terry.becker@twbesc.ca.