Cementex

The Safety Tool Specialists

Double-Insulated Hand Tools & Personal Protective Products
for safety and compliance to OSHA, NFPA 70E and CSA-Z462 standards

Price List Effective October 1, 2010 v2

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ELECTRICAL SAFETY COMPLIANCE CHART FOR NFPA 70E AND CSA Z462

Energized work shall only be performed when permitted by 70E 130.1(A) / Z462 4.3.1.1.1. For tasks not listed or for power systems with greater than the assumed maximum short circuit current capacity or with longer than the assumed maximum fault clearing times, an arc flash hazard analysis shall be required in accordance with 70E 130.3 / Z462 4.3.3. This summary table is only for use by ***QUALIFIED PERSONNEL*** that have been trained in accordance with the most current version of NFPA 70E Article 130 / CSA Z462 Clause 4.3.

Tasks Performed on Energized Equipment (600 volts or less): 70E 130.7(C)(9) / Z462 Table 4

Table A Panelboards or Other Equipment Rated 240 V and Below *Note 1*		
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	LWG	0
Circuit breaker (CB) or fused switch operation with covers on	LWG	0
CB or fused switch operation with covers off	LWG	0
Work on energized electrical conductors and circuit parts, including voltage testing	IG/IT	1
Remove / Install CBs or fused switches	IG/IT	1
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	LWG	1
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	LWG	0
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the panelboard	IG/IT	1

Table B Panelboards or Switchboards Rated >240 V and up to 600 V (with molded case or insulated case circuit breakers) *Note 1*		
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	LWG	1
CB or fused switch operation with enclosure doors closed	LWG	0
CB or fused switch operation with covers off	IG	1
Work on energized electrical conductors and circuit parts, including voltage testing	IG/IT	2*
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the panelboard or switchboard	IG/IT	2*

Table C Other 600 V Class (277 V through 600 V nominal) Equipment *Note 2 (except as indicated)*		
Lighting or small power transformers (600 V maximum)		
Removal of bolted covers	LWG	2
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	LWG	1
Application of safety grounds, after voltage test	IG	2*
Work on energized electrical conductors and circuit parts, including voltage	IG/IT	2*
Revenue meters (kW-hour, at primary voltage and current) Insertion or	IG	2*
Cable trough or tray cover removal or installation	LWG	1
Miscellaneous equipment cover removal or installation	LWG	1
Work on energized electrical conductors and circuit parts, including voltage testing	IG/IT	2*
Application of safety grounds, after voltage test	IG	2*
Insertion or removal of plug-in devices into or from busways	IG	2*

Table D 600 V Class Motor Control Centers (MCCs) *Note 2 (except as indicated)*		
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	LWG	1
CB or fused switch or starter operation with enclosure doors closed	LWG	0
Reading a panel meter while operating a meter switch	LWG	0
CB or fused switch or starter operation with enclosure doors open	LWG	1
Work on energized electrical conductors and circuit parts, including voltage testing	IG/IT	2*
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	IG/IT	0
Work on control circuits with energized electrical conductors and circuit parts 120 V or above, exposed	IG/IT	2*
Insertion or removal of individual starter "buckets" from MCC— Note 3	IG	4
Application of safety grounds, after voltage test	IG	2*
Removal of bolted covers — Note 3 (to expose bare, energized electrical conductors and circuit parts)	LWG	4
Opening hinged covers — Note 3 (to expose bare, energized electrical conductors and circuit parts)	LWG	1
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the motor control center	IG/IT	2*

Table E 600 V Class Switchgear (with power circuit breakers or fused switches) *Note 4*		
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	LWG	2
CB or fused switch operation with enclosure doors closed	LWG	0
Reading a panel meter while operating a meter switch	LWG	0
CB or fused switch operation with enclosure doors open	LWG	1
Work on energized electrical conductors and circuit parts, including voltage testing	IG/IT	2*
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	IG/IT	0
Work on control circuits with energized electrical conductors and circuit parts 120 V or above, exposed	IG/IT	2*
Insertion or removal (racking) of CBs from cubicles, doors open or closed	LWG	4
Application of safety grounds, after voltage test	IG	2*
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	LWG	4
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	LWG	2

Table X* Hazard Risk Categories that are Known to be Extremely Dangerous		
480V Building Service Entrance Equipment	IG/IT	4+
Equipment on 480V/secondary side of an Ind/Comm substation	IG/IT	4+
All equipment on the load side of circuit breakers containing a short-time delay setting. Temporary removal of short time-delay is	IG/IT	4+

***The above areas are known to commonly equal or exceed a HRC4; calculations should be done prior to energized work**

CLOTHING AND/OR EQUIPMENT 70E 130.7 (C)(10) / Z462 Table 5	HRC 0	HRC 1	HRC 2	HRC 2*	HRC 3	HRC 4
Arc Thermal Protective Value in Cal/Cm^2 (minimum)	0	4	8	8	25	40
Non-melting/untreated natural fiber long-sleeve shirt	X	--	--	--	--	--
Non-melting/untreated natural fiber long pants	X	--	--	--	--	--
Arc-rated long-sleeve shirt	--	X	X	X	X	X
Arc-rated pants	--	X	X	X	X	X
Arc-rated coverall	--	X	X	X	X	X
Arc-rated arc flash suit jacket	--	X	X	X	X	X
Arc-rated arc flash suit pants	--	X	X	X	X	X
Arc-rated arc flash suit hood	--	X	X	X	X	X
Arc-rated jacket, parka or rainwear	--	AN	AN	AN	AN	AN
Hard hat	--	X	X	X	X	X
Safety glasses or goggles	X	X	X	X	X	X
Hearing protection	X	X	X	X	X	X
Leather gloves	AN	X	X	X	X	X
Leather work shoes	--	X	X	X	X	X

NOTES: 70E 130.7(C)(10) / Z462 Table 5

- Arc rating for garments is expressed in calories per centimeter squared (cal/cm^2)
- When rubber insulating gloves (**IG**) with leather protectors are required by NFPA 70E130.7(C)(9) / CSA Z462 Table 4, additional leather gloves or arc-rated gloves shall not be required.
- An alternate to arc rated shirts and pants in HRC 1 or HRC 2 is an arc rated coveralls with minimum of 4 cal/cm2 for HRC 1 and minimum of 8 cal/cm2 for HRC 2
- Face shields are required for HRC 1 (4 cal/cm^2) and HRC 2 (8 cal/cm^2) with wrap-around guarding to protect face, forehead, ears and neck. HRC 2* requires the use of balaclava/sock hood and face shield with a minimum of 8 cal/cm2. Alternatively an appropriately arc-rated flash suit hood may be used.
- Minimum arc rating of 25 is required for HRC 3 which can be accomplished using a total FR clothing system [shirt and pants and/or coveralls and/or coat and pant] and hood.
- Minimum arc rating of 40 is required for HRC 4 which can be accomplished using a total FR clothing system [shirt and pants and/or coveralls and/or coat and pant] and hood.

General Notes : (applicable to the tasks that are 600 volts or less)

(a) Insulating rubber gloves are gloves rated for the maximum line-to-line voltage upon which work will be done.

(b) Insulated tools rated and tested for the maximum line-to-line voltage upon which work will be done, and are manufactured and tested in accordance with ASTM F1505 & CAN/ULC-D60900, Standard Specification for Insulated and Insulating Hand Tools: 1000VAC / 1500VDC

(c) For systems rated less than 1000 volts, the fault currents and upstream protective device clearing times are based on an 18 in. working distance.

(d) For equipment protected by upstream current limiting fuses with arcing fault current in their current limiting range (1⁄2 cycle fault clearing time or less), the hazard/risk category required may be reduced by one number.)

Specific Notes: (as referenced within the tables)

1. Max. of 25 kA short circuit current available; max. of 0.03 sec (2 cycle) fault clearing time.
2. Max. of 65 kA short circuit current available; max. of 0.03 sec (2 cycle) fault clearing time.
3. Max. of 42 kA short circuit current available; max. of 0.33 sec (20 cycle) fault clearing time.
4. Max. of 35 kA short circuit current available; max. of up to 0.5 sec (30 cycle) fault clearing time

Notes:

1. A complete **ARC FLASH HAZARD ANALYSIS** should be done, if fault clearing times vary from those described within the **Specfic Notes**, rendering these tables alone **INSUFFICIENT**.
2. IG/IT indicates the required use of insulating rubber gloves, leather protectors & insulated tools.
3. IG indicates a requirement for the use of insulating rubber gloves and leather protectors.
4. LWG indicates a requirement of leather gloves.
5. Hazard Risk Category **(HRC)** is defined in the last column, by one of five categories **0**, **1**, **2**, **3** & **4** (**0** being the least dangerous and **4** being the most dangerous)

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Arc Flash Task Wear Clothing: FR Treated Cotton

Coat/Parka - Waist Length; Lab Coat - Knee Length; Pants - Dungaree Style Bib Overall w/Emergency Access; Coveralls - Jumpsuit Style w/ Front Closure. Standard inseam length on pants is 32"—call for price/availability on additional sizes. Sizes marked with an asterisk (*) are special order and non-refundable.

Calorie Rating	Style	S*	M	L	XL	2X	3X	4X*	5X*
Hazard Risk Category 2									
8	Coat (Navy)	HRC2-CT-S $92.00	HRC2-CT-M $84.00	HRC2-CT-L $84.00	HRC2-CT-XL $84.00	HRC2-CT-2X $92.00	HRC2-CT-3X $92.00	HRC2-CT-4X $104.00	HRC2-CT-5X $104.00
8	Pants (Navy)	HRC2-OA-S $97.00	HRC2-OA-M $91.00	HRC2-OA-L $91.00	HRC2-OA-XL $91.00	HRC2-OA-2X $97.00	HRC2-OA-3X $97.00	HRC2-OA-4X $110.00	HRC2-OA-5X $110.00
8	Coverall (Navy)	HRC2-CVL-S $166.00	HRC2-CVL-M $145.00	HRC2-CVL-L $145.00	HRC2-CVL-XL $145.00	HRC2-CVL-2X $166.00	HRC2-CVL-3X $166.00	HRC2-CVL-4X $182.00	HRC2-CVL-5X $182.00
8	Lab Coat (Navy)	CLC8-S $102.00	CLC8-M $102.00	CLC8-L $102.00	CLC8-XL $102.00	CLC8-2X $112.00	CLC8-3X $112.00	CLC8-4X $122.00	CLC8-5X $122.00
12	Coat (Navy)	CPK12-S $103.00	CPK12-M $103.00	CPK12-L $103.00	CPK12-XL $103.00	CPK12-2X $120.00	CPK12-3X $120.00	CPK12-4X $120.00	CPK12-5X $120.00
12	Pants (Navy)	CPT12-S $132.00	CPT12-M $132.00	CPT12-L $132.00	CPT12-XL $132.00	CPT12-2X $145.00	CPT12-3X $145.00	CPT12-4X $160.00	CPT12-5X $160.00
12	Coverall (Navy)	CCVL12-S $179.00	CCVL12-M $179.00	CCVL12-L $179.00	CCVL12-XL $179.00	CCVL12-2X $198.00	CCVL12-3X $198.00	CCVL12-4X $214.00	CCVL12-5X $214.00
12	Lab Coat (Navy)	CLC12-S $103.00	CLC12-M $103.00	CLC12-L $103.00	CLC12-XL $103.00	CLC12-2X $120.00	CLC12-3X $120.00	CLC12-4X $120.00	CLC12-5X $120.00
13	Coat (Khaki)	CCT13-S $95.00	CCT13-M $88.00	CCT13-L $88.00	CCT13-XL $88.00	CCT13-2X $95.00	CCT13-3X $95.00	CCT13-4X $112.00	CCT13-5X $112.00
13	Pants (Khaki)	CPT13-S $101.00	CPT13-M $95.00	CPT13-L $95.00	CPT13-XL $95.00	CPT13-2X $101.00	CPT13-3X $101.00	CPT13-4X $114.00	CPT13-5X $114.00
13	Coverall (Khaki)	CCVL13-S $163.00	CCVL13-M $154.00	CCVL13-L $154.00	CCVL13-XL $154.00	CCVL13-2X $163.00	CCVL13-3X $163.00	CCVL13-4X $187.00	CCVL13-5X $187.00
20	Coat (Navy)	CCT20-S $147.00	CCT20-M $147.00	CCT20-L $147.00	CCT20-XL $147.00	CCT20-2X $161.00	CCT20-3X $161.00	CCT20-4X $176.00	CCT20-5X $176.00
20	Pants (Navy)	CPT20-S $162.00	CPT20-M $162.00	CPT20-L $162.00	CPT20-XL $162.00	CPT20-2X $176.00	CPT20-3X $176.00	CPT20-4X $194.00	CPT20-5X $194.00
20	Lab Coat (Navy)	CLC20-S $142.00	CLC20-M $142.00	CLC20-L $142.00	CLC20-XL $142.00	CLC20-2X $156.00	CLC20-3X $156.00	CLC20-4X $172.00	CLC20-5X $172.00
20	Coverall (Navy)	CCVL20-S $189.00	CCVL20-M $189.00	CCVL20-L $189.00	CCVL20-XL $189.00	CCVL20-2X $202.00	CCVL20-3X $202.00	CCVL20-4X $229.00	CCVL20-5X $229.00
Hazard Risk Category 3									
32	Coat (Navy)	CNCT32-S $254.00	CNCT32-M $254.00	CNCT32-L $254.00	CNCT32-XL $254.00	CNCT32-2X $276.00	CNCT32-3X $276.00	CNCT32-4X $302.00	CNCT32-5X $302.00
32	Pants (Navy)	CNPT32-S $268.00	CNPT32-M $268.00	CNPT32-L $268.00	CNPT32-XL $268.00	CNPT32-2X $294.00	CNPT32-3X $294.00	CNPT32-4X $322.00	CNPT32-5X $322.00
32	Coverall (Navy)	CNCVL32-S $292.00	CNCVL32-M $292.00	CNCVL32-L $292.00	CNCVL32-XL $292.00	CNCVL32-2X $315.00	CNCVL32-3X $315.00	CNCVL32-4X $340.00	CNCVL32-5X $340.00
34	Coat (Royal)	HRC3-CT-S $139.00	HRC3-CT-M $126.00	HRC3-CT-L $126.00	HRC3-CT-XL $126.00	HRC3-CT-2X $139.00	HRC3-CT-3X $139.00	HRC3-CT-4X $158.00	HRC3-CT-5X $158.00
34	Pants (Royal)	HRC3-OA-S $148.00	HRC3-OA-M $137.00	HRC3-OA-L $137.00	HRC3-OA-XL $137.00	HRC3-OA-2X $148.00	HRC3-OA-3X $148.00	HRC3-OA-4X $170.00	HRC3-OA-5X $170.00
34	Coverall (Royal)	HRC3-CVL-S $244.00	HRC3-CVL-M $221.00	HRC3-CVL-L $221.00	HRC3-CVL-XL $221.00	HRC3-CVL-2X $244.00	HRC3-CVL-3X $244.00	HRC3-CVL-4X $275.00	HRC3-CVL-5X $275.00
Hazard Risk Category 4									
40	Coat (Navy)	CCT40-S $216.00	CCT40-M $216.00	CCT40-L $216.00	CCT40-XL $216.00	CCT40-2X $237.00	CCT40-3X $237.00	CCT40-4X $288.00	CCT40-5X $288.00
40	Pants (Navy)	CPT40-S $214.00	CPT40-M $214.00	CPT40-L $214.00	CPT40-XL $214.00	CPT40-2X $233.00	CPT40-3X $233.00	CPT40-4X $286.00	CPT40-5X $286.00
40	Coverall (Navy)	CCVL40-S $311.00	CCVL40-M $311.00	CCVL40-L $311.00	CCVL40-XL $311.00	CCVL40-2X $336.00	CCVL40-3X $336.00	CCVL40-4X $347.00	CCVL40-5X $347.00
40	Long Coat	CLCT40-S $345.00	CLCT40-M $345.00	CLCT40-L $345.00	CLCT40-XL $345.00	CLCT40-2X $380.00	CLCT40-3X $380.00	CLCT40-4X $414.00	CLCT40-5X $414.00
40	Leggings	CLEG40-S $88.00	CLEG40-M $88.00	CLEG40-L $88.00	CLEG40-XL $88.00	CLEG40-2X $97.00	CLEG40-3X $97.00	CLEG40-4X $105.00	CLEG40-5X $105.00
40	Coat (Khaki)	HRC4-CT-S $149.00	HRC4-CT-M $137.00	HRC4-CT-L $137.00	HRC4-CT-XL $137.00	HRC4-CT-2X $149.00	HRC4-CT-3X $149.00	HRC4-CT-4X $168.00	HRC4-CT-5X $168.00
40	Pants (Khaki)	HRC4-OA-S $162.00	HRC4-OA-M $147.00	HRC4-OA-L $147.00	HRC4-OA-XL $147.00	HRC4-OA-2X $162.00	HRC4-OA-3X $162.00	HRC4-OA-4X $183.00	HRC4-OA-5X $183.00
40	Coverall (Khaki)	HRC4-CVL-S $260.00	HRC4-CVL-M $238.00	HRC4-CVL-L $238.00	HRC4-CVL-XL $238.00	HRC4-CVL-2X $260.00	HRC4-CVL-3X $260.00	HRC4-CVL-4X $296.00	HRC4-CVL-5X $296.00