

ArcWear.com

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Electric Arc Exposure Tests

April 2006

Tests Conducted at Kinectrics High Current Laboratory
Toronto, Ontario, Canada

Test Results: The ASTM F1958-1999 method evaluates arc tests of clothing on mannequins. These tests were non-standard in that this is real clothing and PPE and not the standardized clothing required for probability of ignition in the standard test. Therefore this testing does not result in a probability of ignition but only a PPE evaluation. The test results are presented in tabular and graphical form. Each test was video taped. The video tape is included on the CD. Comparisons of the heat across the mannequins at the various sensors are shown in the reports following.

Test Observations:

MSA Topguard Yellow Hardhats performed with minor charring just as MSA V-Guard hardhat performed in ArcWear.com testing.

No melting or ignition in 9-11 cal/cm² exposures from the front or side.

Peltor Optime 101 earmuffs

No melting or ignition in 9-11 cal/cm² exposures from the front or side.

Bilsom 728 earmuffs

No melting or ignition in 9-11 cal/cm² exposures from the front or side.

MSA Comfo Elite Respirator

No melting or ignition in 9-11 cal/cm² exposures from the front or side.

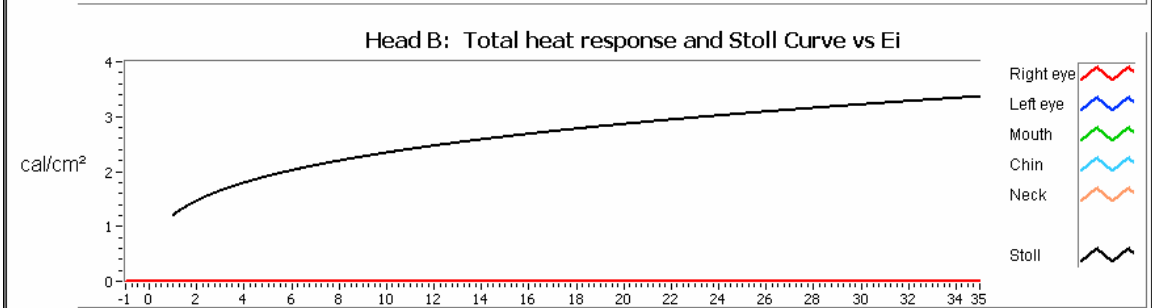
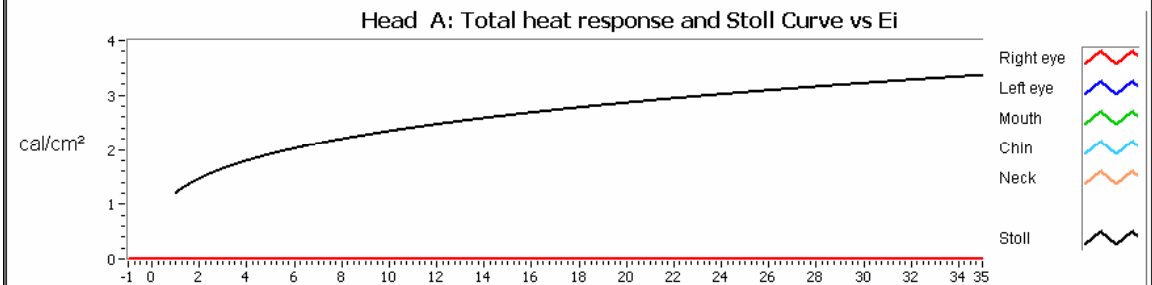
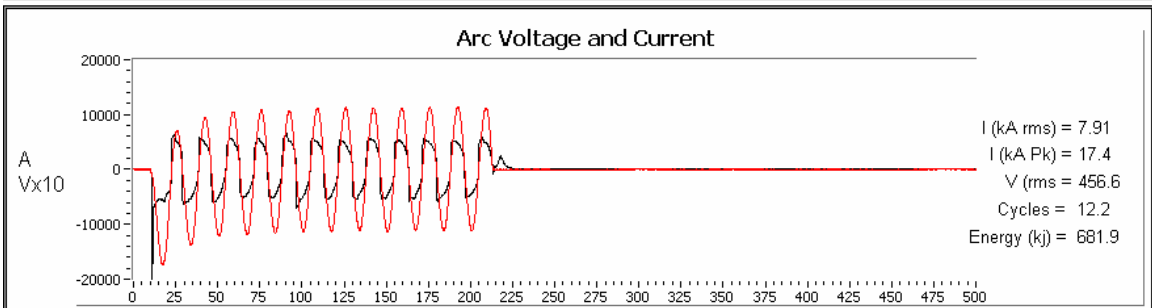
Nylon Safety Belts for mining lights

No melting or ignition in 38 and 41 cal/cm² exposures from the front.

Rubber boots, Yellow Trim

No melting or ignition in a ~40 cal/cm² exposure from the front.

Client: Arcwear.com	Description: Power Arc Tests with mannequins & heads at 12 inches, arc positioned for facial exposure in accordance with ASTM F2178. A: MSA Topguard yellow hard hat / Peltor Optime 101 earmuff with MSA Confo Elite Respirator B: MSA Topguard yellow hard hat / Peltor Optime 101 earmuff with MSA Confo Elite
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Mannequin A Ei = 8.91 Cal/cm² R eye SCD = -1.20 cal/cm ² L eye SCD = -1.20 cal/cm ² Mouth SCD = -1.20 cal/cm ² Chin SCD = -1.20 cal/cm ² Informative Neck SCD = -1.20 cal/cm ²	Mannequin B Ei = 9.81 Cal/cm² R eye SCD = -1.20 cal/cm ² L eye SCD = -1.20 cal/cm ² Mouth SCD = -1.20 cal/cm ² Chin SCD = -1.20 cal/cm ² Informative Neck SCD = -1.20 cal/cm ²
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PRIVATE INFORMATION, This test data shall not be disclosed or distributed without permission of the client.



06-1475 A After Ignition of one strap on respirator which was unprotected by the faceshield



06-1475 A After Ignition of one strap on respirator which was unprotected by the faceshield



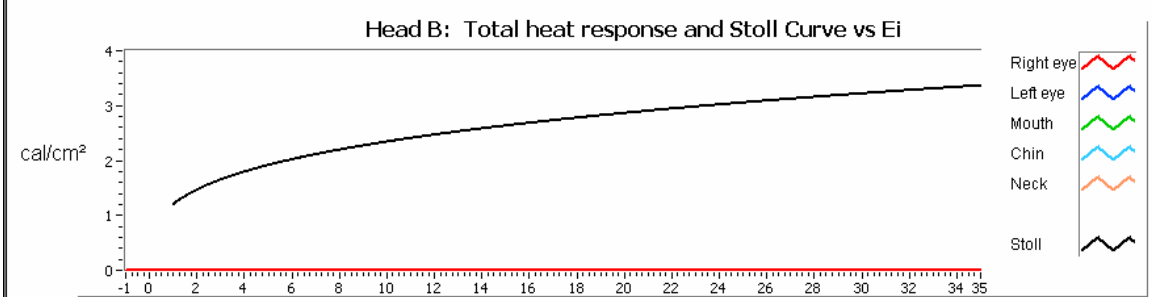
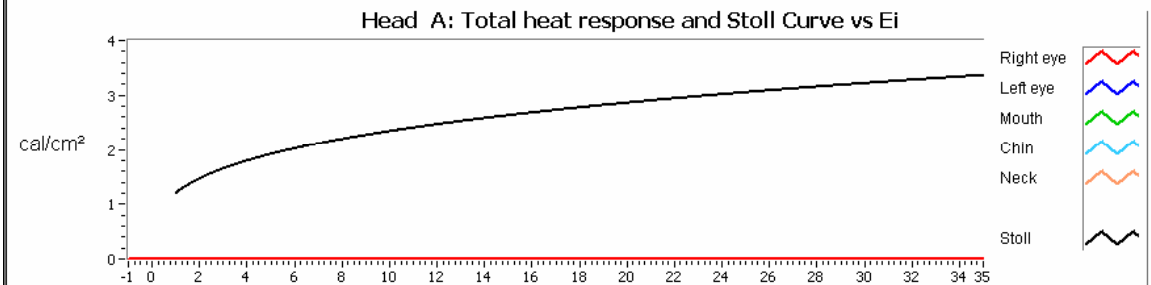
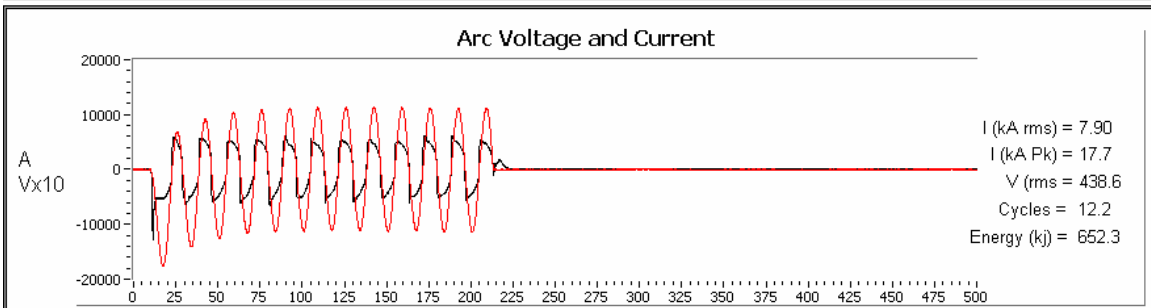
06-1475B After

06-1475B After



All items under the faceshield are not affected at this level.

Client: Arcwear.com	Description: Power Arc Tests with mannequins & heads at 12 inches, arc positioned for facial exposure in accordance with ASTM F2178. A: MSA Topguard yellow hard hat / Peltor Optime 101 earmuff with MSA Confo Elite Respirator B: MSA Topguard yellow hard hat / Peltor Optime 101 earmuff with MSA Confo Elite
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Mannequin A
Ei = 8.91 Cal/cm²

R eye SCD = -1.20 cal/cm²
L eye SCD = -1.20 cal/cm²
Mouth SCD = -1.20 cal/cm²
Chin SCD = -1.20 cal/cm²
Informative
Neck SCD = -1.20 cal/cm²

Mannequin B
Ei = 11.00 Cal/cm²

R eye SCD = -1.20 cal/cm²
L eye SCD = -1.20 cal/cm²
Mouth SCD = -1.20 cal/cm²
Chin SCD = -1.20 cal/cm²
Informative
Neck SCD = -1.20 cal/cm²

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06-1476 B Before



06-1476 B After



06-1476A Before

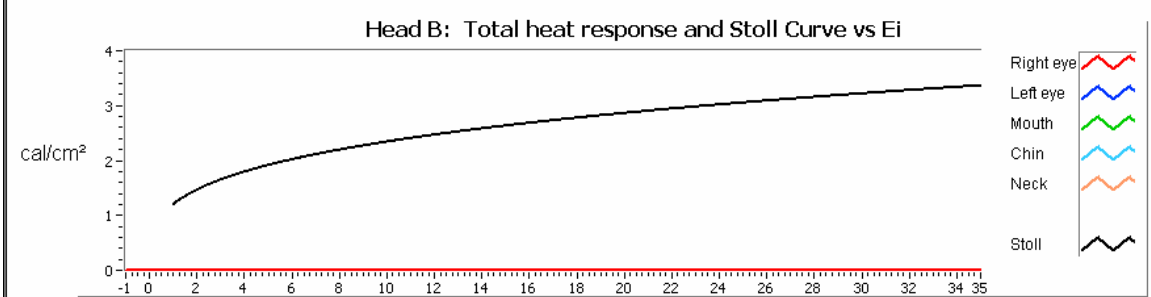
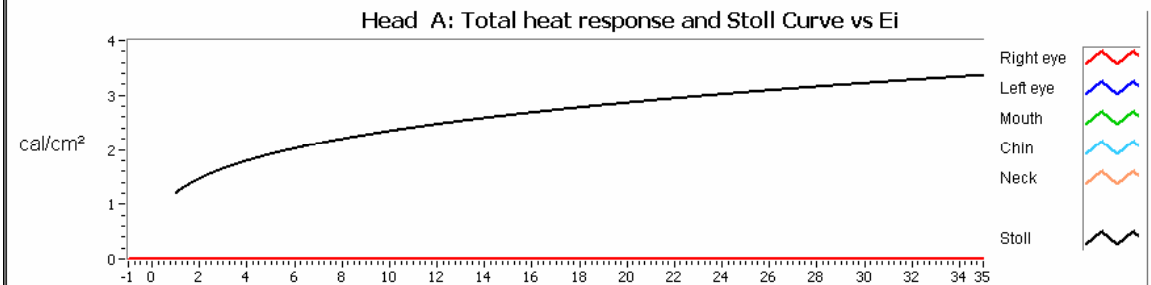
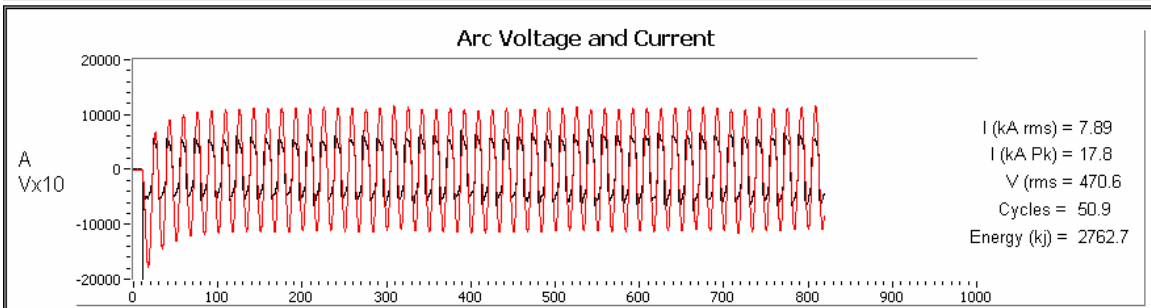


06-1476A After





Client: Arcwear.com	Description: Power Arc Tests with mannequins & heads at 12 inches, arc positioned for facial exposure in accordance with ASTM F2178. A&B safety belts and boots. C: Rubber boots, yellow trim
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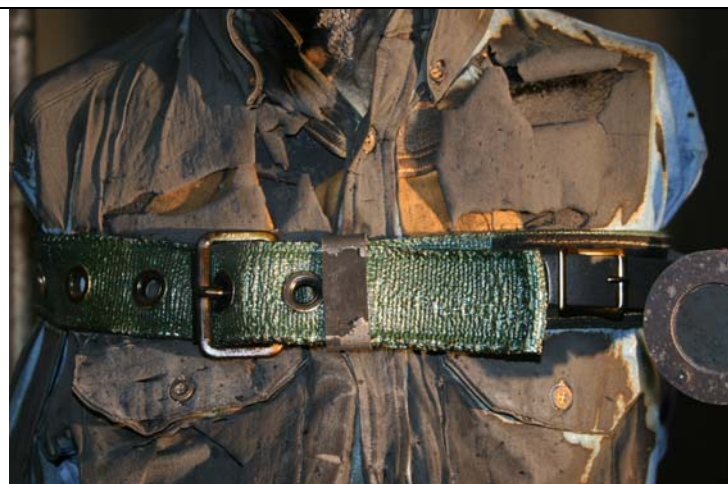
Mannequin A
Ei = 37.75 Cal/cm²

R eye SCD = -1.20 cal/cm²
 L eye SCD = -1.20 cal/cm²
 Mouth SCD = -1.20 cal/cm²
 Chin SCD = -1.20 cal/cm²
 Informative
 Neck SCD = -1.20 cal/cm²

Mannequin B
Ei = 41.30 Cal/cm²

R eye SCD = -1.20 cal/cm²
 L eye SCD = -1.20 cal/cm²
 Mouth SCD = -1.20 cal/cm²
 Chin SCD = -1.20 cal/cm²
 Informative
 Neck SCD = -1.20 cal/cm²

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Conclusions:

The respirator, earmuffs and hardhats under NFPA 70E will not be worn in exposures $>4 \text{ cal/cm}^2$ without using a faceshield and will not be in exposures $>8 \text{ cal/cm}^2$ without using a hood. These PPE choices should not increase worker injury to NFPA 70E exposure levels if additional PPE recommended by this standard are worn. The respirators do have issues of ignition if exposed directly to arc. Other respirators could be evaluated or the respirators could be modified for flame resistance. The issue was the strap on the side.

The rubber boots and belts performed extremely well with no ignitions at $\sim 40 \text{ cal/cm}^2$.