

MICROGARD[®]
CFR

MICROGARD[®] CFR//
Heat Resistant Type 4
Chemical Protective Suit

EN533
Index 1



EN1149
Antistatic



Type 4



Microgard[®] CFR is suitable against hazardous chemicals and has been tested to relevant CE standards and Type 4 (saturation spray).

Protection Level

Microgard[®] CFR is a disposable protective coverall tested to Type 4 (saturation spray), and to EN533 flammability test Index 1.

Technical Information

Microgard[®] CFR Fabric Properties

Microgard[®] CFR passes NFPA 701 Fire Retardancy Tests (both 1989 and 1991)

Blocking	ISO 5978	Slight blocking
Flexing	ISO 7854	>5,000
Bursting	ISO 2960	252kN/M2
Distention	ISO 2960	3.8mm
Tear	ISO 9073	21.4N (md) 25N (cd)
Puncture	prEN863	14.64N
Flammability (tested in "as received" condition only)	EN533:1997	Index 1

Surface Resitivity (applies to inside of garment only)	EN 1149.1	Pass
---	-----------	------

Chemical Barrier

Tested to range of chemicals to standard ASTM F903, including:

Acetone	>60 mins	Benzene	>60 mins
Ethanel	>60 mins	Sodium Hydroxide	>60 mins

Other chemical test results are available, please contact your supplier for further information.

Finished Garment Tests

Seam Strength	ISO 5082	TBA
Type 4 (jet test)	EN 1512	Pass

Microgard[®] FR & CFR Thermal Mannequin Testing

Thermal Mannequin Testing has been conducted to indicate the likely body burn injury as a result of flash fire when wearing different FR garments. The mannequin is covered by heat sensors to create a body map of predicted body burn injury. The flame exposure time is 3.5 seconds at a heat flux of 2.0 cal/cm².

Please note that these tests are conducted under laboratory conditions and are not intended to give definitive information on fire protective properties of any garment but are to serve as a guide only. The final determination of garment suitability for an application is the responsibility of the user.

TEST 1

Nomex[®] IIIA only
(No undergarments)

- 2nd degree burn = 37%
- 3rd degree burn = 12%
- Unprotected
- No information



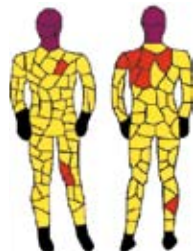
TOTAL BURN INJURY
49%

This shows the total body burn prediction when wearing a Nomex IIIA suit only is 49%.

TEST 3

Microgard[®] FR over
Nomex[®] IIIA

- 2nd degree burn = 9%
- 3rd degree burn = 7%
- Unprotected
- No information



TOTAL BURN INJURY
16%

This shows that wearing the Microgard[®] FR coverall over the TPG instead of the traditional disposable protective coverall, actually improves the overall thermal protection, reducing the total body burn prediction to only 16%.

TEST 4

Microgard[®] CFR over
Nomex[®] IIIA

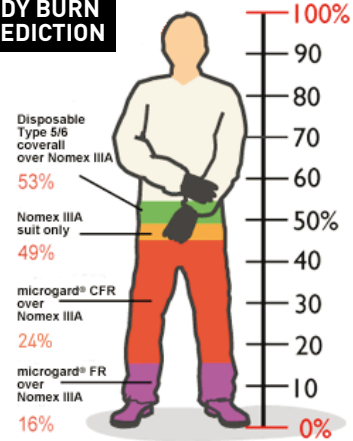
- 2nd degree burn = 35%
- 3rd degree burn = 9%
- Unprotected
- No information



TOTAL BURN INJURY
24%

Because the CFR provides a higher level of chemical protection sufficient for Type 4 by the addition of a special film coating, the overall thermal protection is not as good as with the Microgard[®] FR. However, with a reduction in total body burn to 24%, it is still an improvement on the Nomex IIIA only.

BODY BURN PREDICTION



Our Thermal Mannequin tests predict that:

1. Wearing just a Nomex IIIA overall when exposed to the flash fire, the wearer would suffer 49% body burn.
2. Wearing a standard disposable coverall over the Nomex IIIA to provide it with Type 6 chemical protection, will actually reduce the coverall flame retardant effectiveness and increase body burns from 49% to 53% under similar flash fire conditions
3. Wearing Microgard FR over Nomex IIIA to provide the wearer with Type 6 chemical protection, will INCREASE the overall flame retardant effectiveness and decrease body burns from 49% to 16%
4. Wearing a Microgard CFR over Nomex IIIA to provide the wearer with Type 4 chemical protection, will also INCREASE the overall flame retardant effectiveness and decrease body burns from 49% to 24%

Spunbonded polypropylene Microgard[®] Film Laminated

- 2nd degree burn = 23%
- 3rd degree burn = 30%
- Unprotected
- No information

TOTAL BURN INJURY

Disposable Type 5/6 coverall worn over Nomex IIIA (PP coated polypropylene - 54g, often used as an over-garment to Nomex in order to provide chemical splash protection).

This shows the effect of the standard disposable protective garment, when worn over the TPG, is to reduce the overall thermal protection, increasing total body burn to 53%.