

ARCFLASHWEAR

AUSTRALIAN MANUFACTURED
FIRE RATED INDUSTRIAL SOCK



PRODUCT GUIDE

INTRODUCTION

In the PPE industry, there has been an increase in the need and innovation for multi-hazard PPE garments that test for protective performance against multiple exposures that workers may encounter on the job site. OSHA 1910.269 requires that employers assess the workplace to identify the hazards employees are exposed to. The employer is also responsible for ensuring that workers exposed to hazards from arc flash, flash fire and molten metal are not wearing clothing that could melt onto the skin or that could ignite and continue to burn when exposed to flames or the estimated heat energy.

It is well known that many garments claiming to be FR actually meet no relevant performance specification. It is also well known that wearing arc rated or flash fire rated clothing greatly improves the chance of survival when an arc flash or flash fire incident does occur.

The Australian manufactured Fire Rated Industrial Sock is a unique, comfortable, three layer constructed garment. The garment was engineered to provide an additional layer of protection for employees working in primary smelters where molten metal can enter safety footwear or penetrate protective work wear. The garment is however multi-purpose and suitable for any environment where there is risk of injury from extreme heat, ignition, arc flash or flash fire. The garment's ability to protect the wearer against injury lies in a unique knitting process.

Tightly knitted layers assist in diffusing flame immediately, allowing the garment to resist extreme heat and molten metal to temperatures of 1400°C. In such extreme conditions, the garment will not melt and affix itself to the wearer's body.

In most socks the wool and nylon yarns are drawn in at the same time and are spread throughout the inner and outer sections of the sock. The Australian Fire Rated Industrial Sock manufacturer re-engineered the specialised knitting machines so that the treated wool is knitted on the outer sock section with a nylon mesh panel in the middle.

Pure wool knitted in a deep, terry construction throughout the sock inner provides enhanced cushioning and comfort. The upper welt section is a 1x1 rib construction which helps reduce calf pressure.



- ISO 9185: Molten Aluminium to 780°C.
- ISO 9185: Cast Iron to 1400°C.
- ISO 6940: Burning Behaviour: Ignition time greater than 20 seconds.
- AS 2755.1 Vertical Ignition Open Flame Test – Test Result: 15 seconds.
- AS/NZS 45024 Molten Splash Test: no adherence for 180gm mass at 800°C.

AUSTRALIAN FIRE RATED INDUSTRIAL SOCK PRIMARY APPLICATIONS

MOLTEN METAL

Primary and Re-melt Smelting



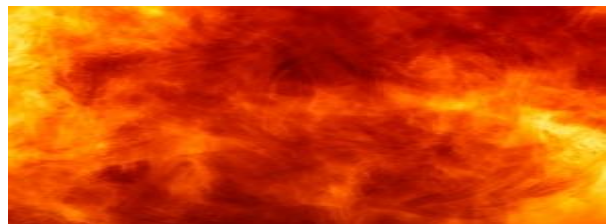
ARC FLASH

Electric and Gas Utilities and
Electrical and Gas Maintenance



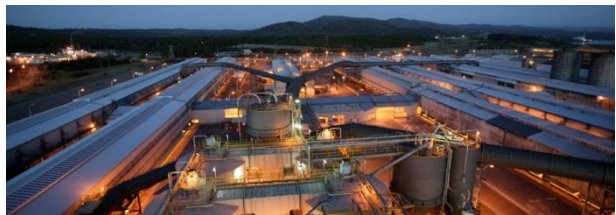
FLASH FIRE

Petrochemical, Oil and Gas and
High Risk Industrial Environments



HEAVY INDUSTRY

Foundries, Pipeline Construction
and Maintenance and
Offshore/Onshore Drilling



INTENSE HEAT AND FIRE
Structural and Wildland Fire
Fighting, Military, Police and SES



AUSTRALIAN FIRE RATED INDUSTRIAL SOCK FEATURES

Premium Protection Against Molten Metal, Arc Flash, Flash Fire and Intense Heat



KNEE LENGTH IN BLACK OR NAVY



CUSHIONING OF THE FOOT ENSURES COMFORT, STRETCH AND DURABILITY



UPPER WELT 1 X 1 CONSTRUCTION REDUCES CALF PRESSURE

AUSTRALIAN FIRE RATED INDUSTRIAL SOCK FEATURES

- Pure Australian Merino Wool (93%), Nylon (7%).
- Knee length three layer construction featuring tightly knitted layers.
- Outer layer - heavy gauge knitted wool construction.
- Middle layer – knitted nylon mesh panel for durability.
- Inner layer – pure wool in a terry padded format for comfort and cushioning.
- The upper welt section is pure wool 1 x 1 rib construction, which helps reduce calf pressure.
- Flame and static resistant.
- High moisture absorption.
- Reinforced heel and toe.
- Virtual seamless toe seam.
- Features SFS (Secure Fit System).

WEARER TIP

As an alternative to wearing the garment fully extended to below the knee, wear as a loose fit and roll the garment down over the top of the smelter/work boot. Doing so creates a seal around the top of the boot.



HOW TO AVOID BLISTERS

Blisters on the feet occur when the foot moves or slides inside the boot. This is common in rubber boots, which are not made to fit snug like regular footwear. Added to this problem is the fact that our feet usually perspire when encased in rubber or regular work boots, especially in warm or hot climates. This tends to keep the skin on the feet soft rather than calloused. The friction of the foot rubbing against the inside of the footwear will wear the skin producing a blister.



There are a number of ways to reduce the possibility of blisters on the feet. One of the easiest ways is to double sock which involves using a polypropylene sock liner inside a Wool or Cotton blend sock. Polypropylene is a man-made fibre, which wicks or draws moisture away from the skin.

The main or other protective sock should be Wool or a Cotton blend sock, which will allow moisture to evaporate. Nylon, Orlon or other man-made fibres do not allow for airflow like a natural fibre, so they tend to stay wet. Wool retains its warmth even when wet while Cotton will start to feel uncomfortable if it becomes wet in cold conditions. Socks are usually manufactured in different thicknesses, so choose a sock for your work boot which helps to take up some of the excess room inside the boot.

ISO 6940 TEXTILE FABRICS: BURNING BEHAVIOUR: DETERMINATION OF EASE OF IGNITION OF VERTICALLY ORIENTED SPECIMENS

ISO 6940 specifies a method for the measurement of ease of ignition of vertically oriented textile fabrics and industrial products in the form of single or multi-component fabrics (coated, quilted, multi-layered, sandwich constructions and similar combinations), when subjected to a defined flame. This method assesses the properties of textile fabrics in response to flame contact under controlled conditions.



ISO 6940 Burning Behaviour
 Determination of Ease of Ignition of Vertically Oriented Specimens
 Date of testing: 12/01/04
 Conditioned at: 20 +/- 2°C, 65 +/- 2%RH
 Ambient temperature and humidity for testing 21°C, 48%RH
 Specimen size: 80 mm x 80 mm
 Barometric Pressure: 759 mm/Hg Type of Ignition: Surface
 Gas used: Propane

Warp	Ignition Time Seconds	Result	Weft	Ignition Time Seconds	Result
1	20	X	1	20	X
2	20	X	2	20	X
3	20	X	3	20	X
4	20	X	4	20	X
5	20	X	5	20	X
6	20	X	6	20	X
7	20	X	7	20	X

After 5 Domestic Washes

Results: Y = Ignition: X = Non-ignition

ISO 9185 PROTECTIVE CLOTHING: ASSESSMENT OF RESISTANCE OF MATERIALS TO MOLTEN METAL SPLASH (ALUMINIUM)



ISO 9185 specifies a method for assessing the heat penetration resistance of materials intended for use in clothing to protect against large splashes of molten metal. It provides specific procedures for assessing the effects of splashes of molten aluminium, molten cryolite, molten copper, molten iron and molten mild steel. The principle of the test method is applicable to a wider range of hot molten materials than those for which specific procedures are set out, provided that appropriate measures are applied to protect the test operator.

ISO 9185 Protective Clothing: Assessment of Resistance of Materials to Molten Metal Splash
ALUMINIUM heated to 820° C (to give pour temperature 780°C +/- 20°C)
 Specimen angle to horizontal 60 +/- 1°
 Pour Height 225 +/- 5 mm

Aluminium Pour Test	Amount Poured (grams)	Metal Adhered to Fabric	Damage to Skin
1	210.0	N	Y
2	183.0	N	Y
3	172.0	N	N
4	170.0	N	N
5	170.0	N	N
6	170.0	N	N

After 5 Domestic Washes

Molten Metal Splash Index 177.5 calculated as the mean of the lowest mass poured to cause damage and the highest mass poured (of the 4 tests required) not causing damage.

ISO 9185 PROTECTIVE CLOTHING: ASSESSMENT OF RESISTANCE OF MATERIALS TO MOLTEN METAL SPLASH (CAST IRON)

ISO 9185 Protective Clothing: Assessment of Resistance of Materials to Molten Metal Splash
CAST IRON heated to 1500°C (to give pour temperature 1400°C +/- 20°C)
 Specimen angle to horizontal 75 +/- 1°
 Pour Height 225 +/- 5 mm

Initial Weight of Cast Iron (grams)	Amount Poured (grams)	Metal Adhered to Fabric	Damage to Skin
60.4	57.4	N	N
100.1	99.8	N	N
150.5	147.3	N	Y
128.9	124.1	N	Y
110.9	108.8	N	N
110.6	109.4	N	N
109.5	108.1	N	N
111.2	109.9	N	N

After 5 Domestic Washes

Molten Metal Splash Index 117.0 calculated as the mean of the lowest mass poured to cause damage and the highest mass poured (of the 4 tests required) not causing damage.

INDEPENDENT CORPORATION TESTS



Independent Secondary Protective Clothing tests conducted by Indalloy Toronto Division, Ontario, Canada (a subsidiary of Norsk Hydro ASA owned Sapa Group), found as follows.

Norsk Hydro ASA is a Norwegian aluminium and renewable energy company, headquartered in Oslo. It is one of the largest aluminium companies worldwide. It has operations in some 50 countries around the world and is active on all continents.

RUN-OFF TEST

- A stand was set up consisting of a thin painted steel sheet angled at 65° and running into a steel pit sow.
- For the run-off tests, the sample was draped over the steel sheet and approximately .5 kg of molten aluminium at approximately 1350° F (732° C) was poured over it.

Sample	Weight	Adhered	Ignited	Paint Scorched	Comments
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Fire Rated Sock	N/A	No	No	No	Material discoloured? - light
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BURN THROUGH / IGNITION TEST

- For the burn through/ignition tests the sample was placed in the steel pit sow and approximately .5 kg of molten aluminium was poured on and allowed to sit until the material ignited or burned through.

Sample	Weight	Burn Through	Ignited	Time for Burn Through or Ignition	Comments
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Fire Rated Sock	N/A	Yes	No	> 5 seconds	Melted through? – resisted melt through.
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AUSTRALIAN FIRE RATED INDUSTRIAL WOOL SOCK: CARE GUIDE

CARE INSTRUCTIONS

- Warm machine wash.
- Wash separately first wash.
- Wash dark colours separately.
- Wash and dry inside out.
- Do not bleach.
- Warm tumble dry.
- Dry without delay.

BEST TO:



Warm Wash
Max. Temp.



Wash
Separately
First Wash



Wash Dark
Colours
Separately



Wash and Dry
Inside Out



Do Not
Bleach



Warm Tumble
Dry



Dry
Without
Delay

MORE INFORMATION

ARCFLASHWEAR

ArcFlashWear is the Australian Distributor of NASCO ArcWear™, PetroWear™ and Envisage™ Protective Outerwear Solutions and a specialist supplier of premium PR97® and UltraSoft® FR Workwear.

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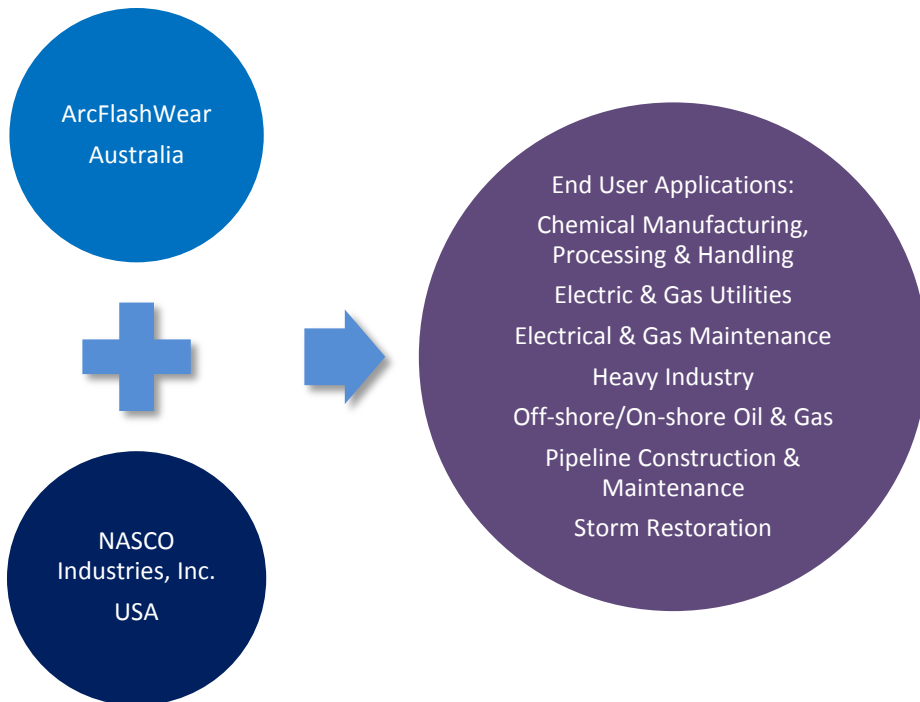
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