

CHARLES PARSONS
Technical Est. 1915

Flame Resistant Protective Workwear – It's a growing market!

Presented at TTNA 2013 Conference

By

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It's a growing market !!!

- What makes me say that?
- Everyone knows TCF is disappearing
- No – I'm not certified, but our fabric is!
- Over the next 20-30 mins I will explain my optimism and expand on the key growth drivers



Basic Flame Resistant terminology

- Flame Resistant vs Flameproof
- Flame Retardant and Flame Resistance
- Treated fabric vs Inherent fibre
- Flame Resistant vs Arc Resistant (FR vs AR)
- Primary Protective Gear vs Secondary Protective Gear
- The three common threats:
 - Flash Fire
 - Electric Arc
 - Molten Metal Splash



Common Threats and Associated Industries

- Flash Fire – Wildlands, Petrochemical, Oil & Gas, Pyrotechnics, Explosives, Combustible dust, etc..
- Electric Arc – Generation/Transmission/distribution, Industrial electrical workers, Electrical & Maintenance contractors, etc..
- Molten Metal Splash – Smelters, Foundries, Welders, etc..
- Sheets on submarines & merchant ships, Aircraft seat covers, prison mattress covers, curtain lining, etc..



The aim is to prevent clothing fires

- Various ignition sources eg. Flash fire, Arc flash, Metal splash, Welding spatter, etc...
- Clothing fires can lead to very serious burns or even fatality
- Large area body burns present much greater risks of dying.
- In 1999 NFPA analysis of electrical accident deaths found that 80% were due to burn complications



Cotton is not Flame resistant

! NON-FR

EQUIPMENT

200 Amp Disconnect

TEST PARAMETERS

Voltage = 480
Amperage = 12.5 kA
Cycles = 10
Distance = 12"
"Arc in a Box"

CALCULATED ENERGY
Per IEEE 1584

8.4 cal/cm²

MAIN MENU

Top 10 Video Clips
No Manikin Clips
NON-FR Clips
INDURA[®] Ultra Soft[™] Clips

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WESTEX INC.
A WORLD LEADER IN FLAME RESISTANT FABRICS
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Explosions created by 70E Solutions at KEMA Powertest

QUIT

CLOTHING ON MANIKIN
Pant = 100% Cotton
Shirt = 100% Cotton

Top 10 - Clip 7

Poly/Cott gab is not FR!


NON-FR

EQUIPMENT
200 Amp Disconnect

TEST PARAMETERS

Voltage = 480
Amperage = 16.5 kA
Cycles = 13
Distance = 12"
"Arc in a Box"

CALCULATED ENERGY
Per IEEE 1584

7.6 cal/cm²

MAIN MENU
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No Manikin Clips
NON-FR Clips
INDURA[®] Ultra Soft[®] Clips

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QUIT

CLOTHING ON MANIKIN
Pant = 65/35 Poly/Cotton
Shirt = 65/35 Poly/Cotton

Top 10 - Clip 2

UltraSoft is FR for Life of garment

INDURA
Ultra Soft
Flame Resistant Fabrics

CLOTHING ON MANIKIN
Pant = INDURA® Ultra Soft® Style 451 9oz; After 100 Industrial Launderings
Shirt = INDURA® Ultra Soft® Style 301 7oz; After 100 Industrial Launderings

Top 10 - Clip 5

EQUIPMENT
100 Amp Disconnect

TEST PARAMETERS
Voltage = 480
Amperage = 11 kA
Cycles = 12
Distance = 12"
"Arc in a Box"

CALCULATED ENERGY
Per IEEE 1584

10.4 cal/cm²

MAIN MENU
Top 10 Video Clips
No Manikin Clips
NON-FR Clips
INDURA® Ultra Soft® Clips

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QUIT

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What are the growth drivers?

1. Defence – changes in warfare
2. Performance Standards – industry/enduse specific. Eg AS/NZS4824
3. OH&S Legislation/Worksafe
4. Industry awareness and adoption
5. Availability of comfortable, competitively priced, proven market performing fabric.



1. Defence

- Early adopters, leaders in protective technology
- Falkland War 1982 – Aluminium burns!
- DPNU developed for Australian Navy
- I.E.D.s & Tank personnel require FR DPCU
- Demand rises & falls with levels of overseas deployments.



2. Performance Standards

- USA & Europe lead the way
- Current Aust examples include AS/NZS 4824, AS/NZS 4967, AS/NZS 4836
- Other overseas stds commonly referred to here include, NFPA 70E, NFPA 2112, ISO 11612, 11611 & 14116, etc.,
- Very few standards are gazetted, but because they are industry documents they are recognised as the min. performance
- New stds coming in US – HiVis FR option and Combustible Dust hazards.



3. OH&S legislation/Worksafe

- Employer's responsibility to provide a safe work environment
- Worksafe helps avoid workplace injuries, enforces legislation, provides insurance, rehab., workers comp
- Advertising "the best reason for safety is not at work!"
- Compliance is a sound investment against the human cost, liability cost, premium cost, disruption cost, etc after an accident.



4. Industry Awareness

- In the absence of specific Aust. Stds industry is taking the lead.
- Industries are doing their own risk audits.
- Local companies are following their international affiliated/parent coy.
- OH&S is being harmonised.
- Industry/professional bodies conduct seminars, conferences, forums on safety and protective workwear.
- National advertising campaigns.



5. Availability

- Overseas growth in US Europe & China has driven the availability of new fabrics and new fibres
- Cotton based flame resistant fabrics still dominate the market due to their market- proven performance, natural comfort, and excellent value eg. UltraSoft[®], Proban[®]
- Local stock, broad colour range, variety of weights, local/offshore delivery options



The fibres (New?)

Cotton-based, branded fabrics – Market proven

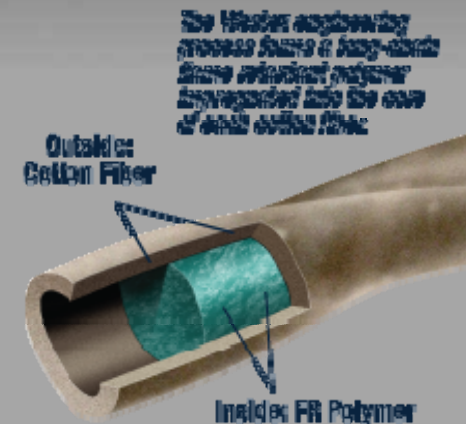
- UltraSoft®, Proban®, Daletec®, etc..

Generic, unbranded cotton-based fabrics – Unproven, no backing, limited technical experience

- Raft of these out of the US, China, India – at your own risk

Inherent fibres

- Aramids eg Nomex®, Kevlar®, Kermel®, etc., - great performance at a price, low on comfort.
- Modacrylic eg Kanecaron®/Protex® - cheaper than Aramid
- Carbonised Fibres eg Spentex®, Carbtex®, Carbon X®, TecGen® - Great performance, but expensive.
- Polyacrylates eg Tecstar®, Didon®**** - Good comfort, good performance
- PPS – Slightly cheaper than aramid.
- PVA eg Vinal®, Vinylon® - Still expensive



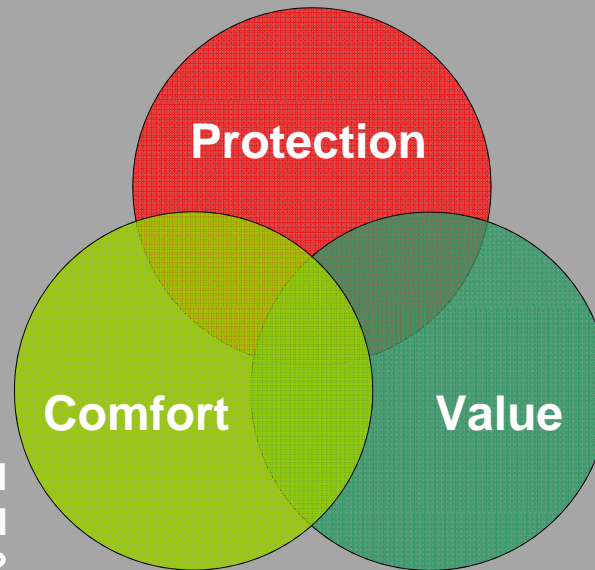
New Fabric blends

- TecaSafe Plus® - Modacrylic/Lyocell/Aramid
- Protera® - Modacrylic/m&p-aramid/P140
- Tecgen Select®
 - FR Rayon/TecGen/Modacrylic/Twaron/nylon
- Spentex Fabric/Carbtex fabric/Carbon-X fabrics – all various % blends of carbonised fibre
- Lot of “old” fibres in new blends (some of which have been patented!)
- And there are more on the way!



Keys to Choosing a Successful FR Programme

What hazard(s) are presents?
What performance standards are available
for the hazard?
What products options are available that
protect to the level of our hazard(s)



What is the maximum level
of protection that our personnel
will volunteer wear?
What choices can me allow

Purchase, Lease or Rent?
What option will have
reasonable durability
at their comparative price?

Why Cotton FR is still Dominant?

- FR is guaranteed for the life of the garment
eg UltraSoft®
- Natural comfort of cotton
- Durable and Industrial Launderability
- Overall value equation – performance, comfort & price.

**TAKE EVERYONE'S ADVICE,
BUT DON'T TAKE ANYONE'S WORD!**

– DO YOUR OWN GARMENT TRIAL!

