PROTECTION FROM

FLAME
METAL SPLASH
SPARK &
ARC FLASH
TESTED.
CERTIFIED.
TRUSTED.
DALETEC PROTECTS

TRADITIONS OF COMFORT AND PROTECTION

PROTECTING SPECIALIZED WORKERS

PRODUCING THE BEST PROTECTION

THE FABRICS OF PROTECTION

PROTECTING PEOPLE AND THE PLANET

PROTECTING WEARERS

PROTECTION BEYOND STANDARDS

PIONEERING PROTECTION INTO THE FUTURE
DALETEC GIVES YOU THE VERY BEST IN PROTECTION, COMFORT AND QUALITY, WITH THE DURABILITY THAT DELIVERS VALUE. WHEN YOU CHOOSE DALETEC, YOU GET:

EXPERTISE
- A FR fabric pioneer and industry innovation leader.
- A team of expert textile engineers ready to create new materials for your specific needs.
- Technical support for our partners whenever and wherever required.

RELIABILITY
- Guaranteed access to the highest quality raw materials, including the best cotton in the business.
- Global reliability, with regional logistic strengths.
- Short lead times, along with one-stop FR garment solutions, through partnerships with other mills.

STABILITY
- A broad array of lab-tested, field-proven, market-preferred, certified fabrics – in stock.
- Tough, durable clothing, with protection that outlasts the garment, to give you the best value.
- The most stable quality levels in the business.

COMFORT
- World-famous “Dale comfort.”
- Superior fabrics, dependable service, competitive terms.
SINCE INVENTING DURABLE FR WORK WEAR FABRICS FOR THE NORTH SEA OIL INDUSTRY MORE THAN 40 YEARS AGO, DALETEC HAS BECOME A WORLDWIDE LEADER IN FLAME RETARDANT AND PROTECTIVE WORK WEAR FABRICS.

Our pioneering research has led to ongoing innovation for the unique Daletec products now used in energy, electrical, metal and other heavy industries in more than 100 countries.

As standards and demands have increased, Daletec innovations have led the industry. Daletec is now known for delivering best available solutions for industrial workers who require protection against heat and flames, electric arc and hot metal splash.

THEN...

Dale Factory Group was founded in 1879 after Peder Jebsen discovered the great river and waterfalls around the valley of Dale. He bought water rights, built power stations and founded what was to become Norway’s largest textile enterprise.

“Dale Quality” has since become an expression of excellence in Norway as well as internationally.

Since the ‘60s, under the names “Dale Fabrikker” and “Dale AS,” the company grew into one of the leading producers of flame retardant workwear fabric with the brand “Dale Antiflame.”

NOW...

The company and its fabrics are now both known by the Daletec brand.

Administration and development remains in Norway. Since 2009, international licensed suppliers – leading integrated textile producers in competitive locations – have made Daletec fabrics. Production managers and workers at all sites are trained by our own technicians to ensure Dale quality is being delivered time after time.

We now produce a wide range of specialized products with impregnations, lamination, special coatings and inherent fire retardant fabrics. And we’re exceeding global standards to give production workers in niche industries around the world even more comfort, even more durability and even better protection.
TRADITIONS OF COMFORT AND PROTECTION

VISION
Daletec focuses on safety, innovation and quality to deliver the best FR protection today and develop advanced products for the future.

MISSION
Our mission at Daletec is to lead the industry in protecting people by meeting the evolving global demand for FR fabric.

ETHICS
At Daletec, we contribute to
• Advancement of our partners,
  • Development of our communities, and
• Protection of the environment.

VALUES
Daletec grows by strengthening our people, relationships, integrity, diversity and reliability.

We guarantee durable flame resistance in all our products, and FR technologies that will outlast your garments.

Our customers demand the very best fabrics, so we use the very best fibers, chemicals and dyes, and then we apply our own unique production processes that lead the industry.
Daletec invents, develops, produces and supplies high quality protective textiles, suitable for the toughest work under the planet’s most demanding conditions.

Daletec offers a fabric solution wherever textile garments are needed to protect a company’s most valuable asset, its workers.

- If there is a threat from flames, garments made out of Daletec fabrics will not burn when flame source is removed.
- If there is a risk for injuries due to welding or grinding sparks, the wearer will be safe behind the shielding garment of Daletec fabric.
- If there is a need for protection against cold weather, garments with Daletec insulation will keep you warm.

For different end user demands, we develop specific fabrics from the most suitable fibers and chemistry. Our R&D team carefully determines the type of process for the best results. Every product is then extensively tested – not only to certification levels in the lab, but also in real-world simulations under extreme conditions.

Over the past decades, Daletec has grown from a factory focused on Northern Europe to become a global protective-fabric brand with customers on all continents and end users in more than 100 countries. From the rugged roughneck in the harsh North Sea, to the refinery worker in frosty Siberia, to the sweat-soaked driller in the Mexican gulf, to the aluminum plant worker in Iceland, to the industrial electrician in New Zealand... Daletec is proud to keep them comfortably safe.

Most fabrics are made using the best cotton fibers for strength and durability, and with Daletec’s unique processing. In addition Rigshield range covers inherently flame retardant fabrics that have FR properties at the fiber level. Our combinations of optimum blends to achieve long-lasting FR properties along with strength and durability help Daletec products stand out from others. RigShield fabrics have FR properties that last longer than the life of garment, and are certified according to Oeko-Tex 100 class 2 which makes them classified as skin-friendly.

Also available in high-vis colors, in cold-flexible and breathable waterproof designs, and with a range of additional properties.
SPARKSHIELD

SPARKSHIELD FABRICS COMBINE FLAME RESISTANCE WITH ANTISTATIC PROPERTIES.

You get protection from flame tongues and arc flashes, and from charge-sparked explosion of flammable gas or liquids.

Comfortable, durable SparkShield fabrics have FR properties that last longer than the garment, and are Certified Öko-Tex 100 class 2 classified as skin-friendly.

Also available in high-vis colours, in cold-flexible and breathable waterproof designs, and with a range of additional properties.

METALSHIELD

METALSHIELD FABRICS HAVE OUR UNIQUE OUTER LAYER WITH COATING THAT REPELS MOLTEN METAL, BLOCKS METAL SPARKS, AND PROTECT IT FROM IGNITING.

Available in aluminum and smelter grade, or in lighter fabrication and welding grade, MetalShield fabrics keep the heat out while giving you cool, lightweight comfort for continuous wear. MetalShield fabrics have FR properties that last longer than the garment, and are Certified Öko-Tex 100 class 2 classified as skin-friendly.
Daletec’s cotton products start with selecting best strong, long and fine fibers spinning them into superior yarn, then calculating the precise weave needed to achieve your comfort and durability standards. Synthetic fibers are chosen for performance on key tests of strength, melting point, char temperature, elasticity/flexibility, resistance to acidity/alkalinity, LOI value and moisture absorbance.

We follow that with state-of-the-art pretreatment using the latest European, Japanese and American machinery to preserve fabric strength, and dyeing with safe and colorfast Oeko-Tex certified products.

FIRE RETARDANT

Daletec is one of the world’s largest users of premium Oekotex certified textile chemistries for FR treatments, which have been proven effective, non-toxic and environment friendly for more than 40 years. Our unique process creates a reaction that permanently binds this chemical as a long-chain flame retardant polymer inside the core of each fiber – without affecting the comfort of the cotton.

Our experts have also pioneered other industry-leading FR and anti-static fabrics using advanced synthetics, alternative chemical treatments, impregnations, laminations and specialized coatings – including weaving unique blends for IFR (inherently fire retardant) solutions.
**EQUIPMENT**

Daletec believes in total quality control and relies on state of the art equipment that sets a base for quality production of goods from raw material to finished product.

**SPINNING**

We are equipped with machinery from some of the leading manufacturers.
- Back process includes cards, combers, drawframes and simplexes from Rieter, Truetzschler, Howa and Toyota.
- Running Rieter Compact (K44 & K45), Toyota Compact and Non Compact and Howa Ring frames.
- Twisting and doubling machines from Muratec.
- Labs are equipped with machinery from Uster including AFIS, Autosorter, Uster Tester 4, Tensoet, Classimate and HVI machines.

**WEAVING**

- Hardware includes machines from Tsudakoma Japan Dornier Germany, and Picanol Belgium
- Warping machines from Benninger Swiss made and Tsudakoma Japan.

**DYEING AND FINISHING**

From singeing to packing, we have chosen the best available machines in the world, including:
- Osthoff singeing machines
- Japanese continuous bleaching plants and mercerizers
- Montforts dyeing and finishing dry ranges.
- Ultramodern FR finishing lines custom-built for consistent quality.
- A unique triple-shrink mechanism to provide wash stability to finished fabric.

**LABORATORY AND EXPERTISE**

If it’s important to you, we test it. Experienced lab technicians use top-of-the-line equipment to ensure all fabric is checked, documented, and approved before it’s shipped. We never compromise on safety and FR protection.

The lab is equipped with the latest testing equipment which are calibrated by international organizations like James H Heal and SDL.

Accredited by ITS and BV, the well trained and experienced staff makes sure that the testing is done according to international standards which include but are not limited to ISO, AATCC, ASTM, JIS and UL certification requirements. (Find more details about our laboratory standards on our website [www.daletec.com](http://www.daletec.com).

That means you can rely on fire retardant capacity, shrinkage limits, tear tensile strength, minimal formaldehyde levels, environmental standards – and much more – in every meter of Daletec fabric.

**TECHNOLOGY ASSISTANCE**

Our experienced Daletec technicians and engineers help customers and end users constantly – with training sessions around the world every year, advice on textile performance, and technical assistance with protective standards.

It’s all part of ensuring you get the best protection for your specific needs.
Hospitals see more than 24,500 such occupational injuries annually in the U.S. alone. In Great Britain, burns and shock kill close to 100 workers a year. More than 250,000 people die from burns worldwide every year, and studies show between 10 to 40 per cent of all burn injuries – and more than 60 per cent of electrical injuries – happen at work.

Whenever there’s a risk of fire... or of a spark that might start one, or cause an arc blast... or of hot metal landing on skin.... there is a Daletec fabric to protect you.
FR, AND MORE

Fire Retardant means a fabric that is self-extinguishing: if ignited, it will stop burning when the source of ignition is removed; without any melting or dripping.

When flames or flash fires are not the only risks, or when there are unique conditions to withstand, work clothes still have to work:

- Insulating from heat (convective heat, radiant heat, contact heat) or extreme cold. Preventing electrostatic discharge – to avoid that sparks cause explosion when igniting gas or aerosols. Shielding from electric arc, hot metal splashes, welding and grinding sparks and/or chemical burns. On top of all, providing extra visibility in complex work environments.

- In the noonday tropics, or the artic night. In the rain and wind. With the flexibility and strength needed for heavy effort.

THE BEST FIBERS FOR FR FABRICS

- Cotton is tough to beat for natural comfort, versatility, strength and performance. It tends to resist heat, and insulates against both heat and cold. Its fibers transport water and sweat, making it breathable with good antistatic properties. It blends well with synthetics and can be dyed in nearly any colour. Cotton does not shrink in flash fire. It is low cost and easily accessible compared to other fibers.

- Polyester can be used for its strength and the low absorbency that make it stain resistant. Polyester is not an FR fiber but gives FR fabric very good stability and low washing shrinkage. Polyester can be dyed in all kinds of brilliant colors with high colorfastness. It also improves the fabric’s abrasion resistance.

- Polyamide is extremely strong and waterproof, able to repel oil and some chemicals. It is not an FR fiber but gives FR fabric strength and durability as well as very good abrasion resistance.

- Aramids (aromatic polyamides) are widely used in FR clothing. They are inherently fire retardant. Meta-aramids are tremendously resistant to heat, abrasion and organic solvents. Para-aramids can add incredible physical strength to a fabric.

- Modacrylic is a FR fiber, which is soft, stable and hard-wearing, easily dyed, and quick to dry, with great resistance to solvents and chemicals (as well as wrinkles). It’s moderately abrasion-resistant, but naturally self-extinguishing, moth and mildew-free, non-allergenic, and has properties that can help block electric arc. It is mostly used in a mix – commonly 40 to 60% – with other fibers for improved FR performance.

- Lyocell is a regenerated cellulose fiber. It is soft and strong, with good heat resistance to insulate against both heat and cold. It absorbs and transports moisture even better than cotton and therefore has good antistatic properties. Lyocell can be dyed in nearly any colour. Its fiber strength is good for a non-synthetic fiber. Lyocell does not shrink in flash fire.

- Carbon/steel fibers are used in FR fabrics for their antistatic properties.

Each fiber has advantages to bring to FR fabrics, if you are guided by expertise in using and blending them. Daletec’s specialists are eager to ensure you find the best fabric for your purpose; our clients tell us this is one of our most helpful and useful services.
PROTECTING PEOPLE AND THE PLANET

Daletec’s entire development and production process is based on protecting not only the end-users of FR fabrics, but also the public, our employees and the environment.

That means:
- In-house wastewater treatment to make sure that there is no harm to aquatic life,
- All types of emissions are tested and documented,
- ISO 14001 certified production houses,
- Preservation of natural resources through use of renewable energy, and
- Use of natural waste like rice husk, corn husk, etc. for energy production.

We also promote eco-friendly chemistries:
- Track all chemicals and other substances we use,
- Get them from reputable suppliers and/or testing them,
- Reduce or eliminate the use of potentially harmful ones,
- Ensure they’re all used, recycled or properly treated and disposed,
- We can accurately report exactly what’s in your fabric.
We're constantly reducing the wastewater we produce and we test it to ensure it won’t damage the environment, continually sampling it for temperature, suspended solids, any oil or grease, oxygen levels, phenols, numerous other organic and non-organic compounds, and dozens of metals.

Throughout the entire Daletec operation, there are procedures in place to manage all waste items and sources, encouraging better reuse and recycling or ensuring effective treatment or disposal through certified contractors.

**OEKO-TEX AND REACH PROTECTION**

Some FR materials shouldn’t be worn directly against skin. Many can be uncomfortable, rough or stiff. Daletec fabric is always safe – no skin reactions or allergies. And we invented the “Dale comfort” softness standard that others struggle to meet.

Daletec uses only Oeko-Tex certified dyestuffs and chemicals, and most fabrics are Oeko-Tex class II certified as safe for direct contact with skin.

We’re proud to produce according to the Oeko-Tex Standard 100 – the global uniform testing and certification system for textile raw materials, intermediate and end products at all stages of production.

It covers multiple human-ecological attributes – including harmful substances which are prohibited or regulated by law, chemicals which are known to be harmful to health, but are not officially forbidden, and parameters which are included as precautionary safeguard. A tested textile product is allocated to one of the four Oeko-Tex product classes based on its intended use. The more intensively a product comes into contact with the skin, the stricter the human-ecological requirements it must fulfill.

Textile products are certified to Oeko-Tex Standard 100 only if all components meet the required criteria without exception.

Daletec also adheres to REACH – the European Union regulation on Registration, Evaluation, Authorization and Restriction of Chemicals that addresses the production and use of chemical substances, and their potential impacts on both human health and the environment.
PROTECTING WEARERS
Every meter of Daletec fabric is completely traceable. Our ERP system tracks each and every step – from raw materials, processing chemicals, and machine productions to quality control results – and records them in a permanent database. The tested specimens and roll cuttings are kept for reference.

The quality of the fabric is maintained online and offline by a quality department working round the clock to ensure that all standards are always met.

**COMPREHENSIVE TESTING**

Before delivery, every roll is tested for its FR properties, and samples taken at least every 1,000 meters must pass complete testing for all physicals, color fastness, durability and safety standards. And those are just some of the processes spelled out in Daletec’s extensive quality manual.

Daletec’s testing lab equipment is calibrated by international organizations like James H Heals and SDL. We’re accredited by ITS (Intertek Testing Services) and BV (Bureau Veritas), so our experienced technicians are able to test and verify product compliance according to standards such as ISO (International Organization for Standardization), AATCC (American Association of Textile Chemists & Colorists), ASTM (American Society for testing and materials), JIS (Japanese Industrial Standards) and others.

**PRODUCT ASSURANCE SYSTEM (PAS)**

Since the FR protection is not visible by the human eye; some garment users want to be reassured that they are protected - still even after extensive use and laundering. Daletec’s long experience show that protection lasts far longer than the garment’s life time, and to share this knowledge with the user, Daletec is offering this free-of-charge service to our partners.

Daletec works with our partners to invite all end users to send two of the garments they’re using to Daletec every three months for testing, when convenient for them or if they have any concerns.

Daletec and our partner replace those garments with new ones free of charge and then, within a few weeks of receiving the used clothing, we provide the end user with a full lab report showing any change in their garments’ fabric strengths or flame retardancy.

Under this Product Assurance System, Daletec refunds our partner the garments’ cost, and the partner pays the cost of returning the garments to the Daletec Lab.

**PROTECTING YOUR FR GARMENT INVESTMENT**

Daletec fabrics give you guaranteed low shrinkage – you can pick your size and it will stay your size. If you choose brilliant, deep colors, they’ll stay vibrant after repeated laundering.

To make sure that you get a lifetime of FR safety from your garments made of Daletec fabrics our experts have developed a comprehensive washing and drying manual for our customers.

Now you can work without being worried that your garments will get dirty, and then need laundering that might damage them. With our recommended care and wash instructions you will continue to get the best performance from your Daletec fabric garments. Our care instruction manual specifies the wash and dry cycles and the auxiliaries to be used so that the garments are clean and the FR performance lasts for the life of the garment.
PROTECTION BEYOND STANDARDS

Safety professionals need to buy protective work wear that works, and there are basic national and international standards for fabric that can do the job.

These standards are written, and in some cases monitored or certified, by organizations such as the International Organization for Standardization (ISO); National Fire Protection Association (NFPA); American National Standards Institute (ANSI); the International Safety Equipment Association (ISEA); ASTM International (formerly known as the American Society for Testing and Materials). Some key FR fabric standards:

- **ISO 11611**
  Protective clothing for use in welding and allied processes. For fabrics' protecting against welding, and the critical test factors are: Flame spread, Impact of splatter (of metal), Heat transfer (radiation), Electrical resistance, and Tear, tensile and burst strength.

- **ISO 11612**
  Protective clothing – Clothing to protect against heat and flame. For fabrics' protection against flame A1, including no melts and drips from the fabric, and against at least one other type of heat, B, C, D, or F. (B-convective heat, C-radiant heat, D-molten aluminum, E-molten Iron, F-contact heat)

- **NFPA 2112**
  Standard on flame-resistant garments for protection of industrial personnel against flash fire. For garments that reduce the severity of burn injuries resulting from short-duration exposure to flash fires – how the fabric continues to burn, char length, no melts or drips, as well as heat resistance, and shrinkage at high temperature.

- **EN 61482-1-2**
  Protective clothing against the thermal hazards of an electric arc. For fabrics’ and garments’ protection from the thermal hazards of an electric arc.

- **EN 1149-1**
  Electrostatic properties – surface resistivity. For fabrics' surface electrical resistance, a key factor in preventing sparks that can cause explosions.

- **EN 1149-3**
  Electrostatic properties – charge decay. Fabrics' potential or ability to get rid of (dissipate decay charge on its surface) the static electricity charge.

- **EN 343**
  Protective clothing – Protection against rain. For waterproof fabric, based on how much pressure it takes to force water through it, and the breathability of the fabric.

**ATPV – Arc Thermal Performance Value** will tell you the energy that the fabric will insulate against in a case of an electric arc in Cal/cm². It is tested by measuring the amount of energy needed to transfer enough heat through the fabric to cause a second-degree burn.

**Ebt – Energy break-open threshold** measures the energy needed to cause the fabric to break open and allow the heat to contact inner garments or skin.

Both ratings can be reported, but the fabric has reached its performance max when one of the to test criteria’s have been reached (second degree burn, or break open)
The unofficial but widespread benchmark for comfort.

For safety professionals, the first and most important consideration in choosing FR apparel is fabric. It’s what mostly determines how well their work wear will protect, how long it will continue protecting, how comfortable it will be, if it will shrink, its appearance, its cost and its overall value.

They rely on numerous standards and certifications for a description of how well a fabric might work. But in addition to considering the technical performance, a professional will also see the value in a fabric brand’s track record.

Daletec goes further. We test our products for resistance against flame tongues and electrical arcs under realistic conditions. And we make sure our products can be washed hundreds of times and retain their fire retardant protection.

Daletec fabrics are tested to exceed the standards for which they’re certified. And the Daletec performance has been market-proven for decades.
PIONEERING PROTECTION INTO THE FUTURE
Daletec is growing into our sixth decade as the leader in protective work wear fabric by keeping our focus on innovating to meet our customers’ emerging needs.

That pioneering research and development approach continues as we expand in global markets, provide protection for more niche industries, and create comfort in more extreme conditions.

There are many FR fabric producers. Daletec aims to be the best – by demonstrating how consistently providing high quality products and service at competitive terms always delivers the greatest value for our customers.

Daletec will continue growing and evolving. Our commitment to end-user safety remains our first priority, and contributing to our customers’ success remains our most important purpose.

PROVEN PERFORMANCE AND INDUSTRY LEADERSHIP

Daletec fabrics provide the best protection in industrial work wear – certified to all relevant ISO, ANSI, ASTM, NFPA, EN and other standards – with flame retardant strength guaranteed for the garment’s entire lifespan.

Daletec fabrics’ strength, comfort and durability come from our guaranteed supply of the longest-available cotton fibers, and our rigorous testing of synthetic solutions. Our products are skin-friendly and all our production is environmentally friendly and ISO-certified.

For all-weather FR protection, our engineers have developed a light, strong fabric that’s paired with a breathable, FR membrane. It repels higher-pressure water and stands up to more frequent washing at higher temperatures than other products in the market. And it stays flexible in extreme cold conditions.

For metal splash protection, Daletec has developed a revolutionary fabric with a repellent outer coating. It handles extreme exposure to molten aluminum, iron and other metals, and a lighter grade sheds concentrated spark streams from grinding or welding without leaving a mark.