PROTECTIVE TEXTILES · 2013

The right choice – for your safety!

With the formation of the European single market more than 20 years ago also a new economic sector was created: Heat and flame protective clothing, chemical protective clothing, garments for high-visibility and weather protection, protective gloves as well as all other kinds of textile protective equipment changed to products where there is a obligation for certification. The CE-mark used a million times for protective clothing came into being.

Together with you, our clients, we have been also grown during these 20 years. Besides the changes in personnel, this can be seen from on the huge amount of new or revised testing and evaluation procedures. Revisions of standards for heat and welders protective clothing changed the requirements for these kinds of garments to a complete flame protection for the user from the seams up to the embroidered company logo. Arc protection clothing – not really well-known at the beginning – is by now not only internationally standardised but also part of many national and international guidelines for the selection of such kinds of garments. Furthermore, protective clothing developed for the business of textile rental companies are no longer tested in domestic washing machines. Instead the ready garment test happens in standardised washing and drying machines suitable for industrial care.

Furthermore, the innovation potential of all actors within the industry characterises this period of time. At the beginning the market was dominated by more simple products with just a few, well-defined protective functions. Today multi-functional protective clothing conquers more and more markets. This can be seen as an excellent proof of the potential of German and European fabric manufacturers to form the basis for novel protective clothing by implementing innovative ideas for new fibre-blends, an intelligent fabric construction up to a customised functionalization of their fabrics. These developments, brought into a qualified and fashionable design by experienced garment manufacturers, convince in the foreseen applications.

The circle is closed with the A+A in Düsseldorf as most important fair for work protection and workers safety. Many exhibitors will demonstrate also this year, how application-oriented a manufacturer can convert the needs and wishes of their customers into garments with high functionality, comfortable design and a good value-for-money-ratio. Naturally, we would also like to use our presence to get in contact with you individually.

We are pleased to welcome you at the A+A in Düsseldorf at our booth in Hall 3, F93.

We help to save your customers
The Notified Body at STFI combines a team of experienced textile engineers, scientists of other specialist areas, technicians and lab assistants.

The activities of all members of the Notified Body are focussed on:

- Competent consultancy for companies in all steps of testing and certification
- Ongoing improvement of test equipment and competence in testing
- Immediate use of newly gained knowledge in assessing protective textiles and clothing

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The accreditation for type examinations includes:

- Protective clothing for workers exposed to heat (EN ISO 11612)
- Protective clothing for use in welding and allied processes (EN ISO 11611)
- Protective clothing with limited flame spread (EN ISO 14116)
- Protective clothing against thermal risks of an electrical arc (EN 61482-Serie)
- Protective clothing for fire fighters (EN 469, EN 13911)
- High visibility warning clothing (EN ISO 20471, EN 1150)
- Protective clothing for rescue service personnel (GUV-R 2106)
- Protective clothing against rain (EN 343)
- Protective clothing against cool environments (EN 14058)
- Protective clothing against cold (EN 342)
- Chemical protective clothing, Type 3, 4, 5, 6 (EN 14605, EN ISO 13982-1, EN 13034)
- Protective clothing against radioactive contamination (EN 1073-2)
- Protective clothing against pesticides (DIN 32781)
- Protective clothing-Antistatic properties (EN 1149-Serie)
- Protective clothing for use where there is a risk of entanglement with moving parts (EN 510)
- Protective gloves against mechanical and thermal risks (EN 388, EN 407)
- Protective gloves against chemicals and micro-organisms (EN 374)
- Protective gloves for fire fighters (EN 659)
- Protective gloves for welders (EN 12477)

As Notified Body No. 0516, Certification Department of STFI certifies all essential types of protective clothing and gloves.
Protective clothing against heat and flames
If it becomes too hot for you, we do our business...

For years, protection against thermal risks caused by flames, heat radiation or molten metal splashes has been representing one of the major demands for protective clothing. In their daily work, millions of end users trust in flame retardant high-tech fabrics which offer in an emergency protection against harmful skin burns.

The Testing and Certification Department at STFI provides their clients all test procedures for protective clothing against heat and flames according to EN ISO 11612 as well as for welders protective clothing according to EN ISO 11611 from one source.

Besides the typical standards like burning behaviour (ISO 15025), heat transmission on exposure to flame (ISO 9151) or radiant heat transmission (ISO 6942), since 2000 we have been testing and evaluating the protection performance of materials against large splashes of molten metal (ISO 9185) in our own laboratory. This offers nearly endless possibilities to test our clients’ materials, in addition to the standardised metals aluminium and iron, with special metals like magnesium, zinc or different alloys. Finally, the protection of employees in practice shall not be limited to the reference materials given in the test standard. Rather the metals actually used have to be taken into account in an appropriate way.

Also for the complete assessment of the protection effect against the risks during welding and allied processes according to EN ISO 11611 the samples have to move only few meters between our labs. Starting with the dimensional change after domestic washing (ISO 6330) or industrial care (ISO 15797), the determination of textile properties, the vertical resistance after 24h conditioning by 85% RH up to the resistance against the impact of small splashes of molten metal, a maximum distance of only 2 floors are between each test result.

Therefore, your heat and flame protective fabrics have to leave our house only once: as sample card in the appendix of your technical type-examination certificate.

Protection against molten metal splashes
Test stand according to ISO 9185/EN 373 at STFI
- to test requirements according to EN ISO 11612
- wide variety of special tests with special metals and alloys (magnesium, zinc, etc.)
on customer request:
- objective determining of heat transmission by means of calorimeter
- comprehensive picture and video documentation

Small amount of molten metal is poured onto a specimen, which is laid against a board. Under the specimen, a skin-simulating PVC film is arranged. The specimen has passed the test, if the minimum mass of the poured metal does not cause damage of the film.

Testing of special clothing

The STFI in Chemnitz is one of only 8 testlabs worldwide and the only one in Germany accredited by the Federation Internationale de L’Automobile (FIA) in Paris for testing heat retarding and flame retarding protective clothing for racing car drivers according to standard FIA 8856-2000.

Since this time STFI has been testing overalls of racing car drivers, special functional underwear, balaclavas and shoes for customers worldwide.
... then it becomes dangerous. Therefore, protective clothing, which is used in flammable or explosive atmospheres must have electrostatic dissipative properties for avoiding these ignition sources. But even when handling ESD-sensitive components and devices (electronics), discharge effects are dangerous and can lead to destruction or damage.

Due to the mostly complex physical mechanisms of interactions between the protective clothing system and the grounded human body, the evaluation of the electrostatic properties requires a high level of specialized knowledge. The staff of the certification department are internationally recognized experts.

In addition to testing and certification of electrostatic dissipative protective clothing we are dealing intensively with the study of electrostatic phenomena and the development of appropriate test methods derived from it.

The EN 1149-3 as a harmonized European test standard for textiles with included conductive fibres was developed at STFi as well as the corresponding test device ICM-1. The latter now belongs to the basic equipment of many international testing laboratories and is currently being further developed.

With the prEN 16350, a test and evaluation method for dissipative gloves belongs to our present standardization activities. Further test methods with the aim of normative implementation are currently under development.

The range of possible tests reach from electrostatic dissipative protective clothing and their materials to ESD-garments (use in electronic areas) but also to the evaluation of floor coverings. Special air-conditioned laboratories and comprehensive expertise together with the available equipment allows the realization of various special tests.

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Protective clothing against laser radiation

New production technologies always require the consideration of possibly resulting new risks at the workplace. This is also valid for the growing use of handheld laser radiation equipment.

Powerful and compact high-performance laser radiation devices with optimised laser beam configurations allow more effective working in different industrial applications. This leads to increased requirements for an efficient and safe protection of the involved workers.

In cooperation with international acknowledged institutions, the test and certification department offers possibilities for safety-related and usage-oriented testing and certification of garments and gloves for protection against the thermal risks of laser radiation to the skin.

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An electric fault arc during the work on or nearby electrical installations under live working conditions is one of the most tremendous incidents for electricians. Within milliseconds and depending on the installation conditions it causes the formation of a fireball with enormous thermal risks by flames, heat radiation and molten hot particles from the destroyed devices. Here arc-tested protective equipment can help to survive.

For more than 15 years, our team has been working on the development of test and evaluation methods for these risks. STFI has developed into a center of excellence for testing and certification of electric arc protection. Together with our partners we could help to make the work on electrical installations safer.

Test materials and garments in accordance with EN 61482-1-2 in one of the two protection classes and on customers' request also in higher incident energy levels. Besides the typical requirements identical to the heat and flame protection, like afterflame time or hole formation, the measuring and evaluation of the energy transmitted through the material and recorded with two calorimeters in the test panel, guarantees an objective statement about the protection performance of the garment.

In addition, we also use the box test to evaluate gloves and face protection equipment in accordance to the most recent knowledge in arc protection. Even in testing and evaluation of fabrics and garments according to IEC 61482-1-1 (Arc rating ASTM F1959) we can assist you in cooperation with our partners.

But only the consideration of all relevant fabric and garment parameters leads to a safe arc protective clothing. Therefore, since 2004 we have been working on IEC 61482-2 as the world's first requirement standard for this clothing and consider all demands in each EC type-examination project. This guarantees you and your customers an arc protection garment based on the current state of the art.

Thus, today each revision of the different arc protection standards, any new development of suitable methods as well as several national and international guidelines for the selection of arc protection clothing bears our signature.
**New s in protective textiles**

EN ISO 20471 as new standard for high-visibility garments supersedes EN 471

After many years of sometimes controversial discussions between the members of the international standardization group, the new standard for high-visibility garments EN ISO 20471 was published in the Official Journal on June 28, 2013. The new document will supersede the European standard EN 471, which loses presumption of conformity with the essential requirements of the Council Directive for Personal Protective Equipment (89/686/EEC) on September 30, 2013. Therefore, at latest from October 1, 2013, all EC type-examination certificates for HiVis garments shall be issued by using EN ISO 20471.

Major changes in the new standard are the additional measurement of chromaticity and luminance factor after a minimum of five care cycles, a complete revision of the design requirements, and new test requirements for coated fabrics and laminates without possibility to offer protection against rain according to EN 343. Certainly, the main challenge the new standard will bring to the ready-garment manufacturers who have to deal with the extensive requirements concerning the garments’ design. In opposite to the superseded standard, EN ISO 20471 uses 5 chapters to describe how the garments have to look like. Major criteria are the body regions torso, legs and arms which are covered by the garment in single or combined way.

But also end users should critically reconsider their design wishes for the garments to be sure it is in accordance with the new requirements of the standard. The most distinctive example is probably the reflex stripe around the waist of a bib and brace trousers which was a “must have” in EN 471 to receive a warning class 2 or 3. The new EN ISO 20471 deleted this requirement and degrade this stripe to a “nice to have accessory” without any influence to the calculation of the required amount of retroreflective material. Due to such major changes in EN ISO 20471 the introduction of a new pictogram with just one number for the warning class of the garment will probably step into the background.

Our members of the Testing and Certification Department for PPE are pleased to advise you on further details.

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**Competitive edge by training courses**

Information on harmonised standards, applicable regulations and directives is an essential part to achieve success in development, production and sale of protective clothing. Knowledge of substantial requirements for protective clothing, specific demands according to the intended protection objective and fundamental test methods is significant for both manufacturer and supplier.

Certification Department at Saechsisches Textilforschungsinstitut e.V. offers training seminars and training courses:

**„Personal Protective Equipment“**


Seminars are held in dependence on the content in one-day or multi-day meetings. Participants receive extensive training and documentation. Theoretical training is accomplished in modern equipped meeting facilities and combined with practical demonstrations at plants and in laboratories.

The training course aims at knowledge and know-how transfer in the field of Personal Protective Clothing according to European standards.

Besides test methods, special requirements to protective clothing are explained.

Based on harmonised standards, the seminar provides information on practical applications in general and special fields, such as protective clothing against heat and flame, high visibility warning clothing, protective clothing against effects of weather, chemical protective clothing as well as protective clothing with antistatic properties.

Comparison of normative requirements and their importance for practical application in working areas will point out interrelations and backgrounds of several test and assessment characteristics.

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