

TUKES REVIEW

1/2001

NEWS FROM THE SAFETY TECHNOLOGY AUTHORITY OF FINLAND



Ever Improving

The year 2000 saw TUKES complete five years of operations. In the main, TUKES was successful in achieving all its goals in all its operational responsibility roles. Namely those of surveillance, development and communications.

Technical safety and reliability remain as in previous years at quite a high level, however, developments in accident statistics are far from satisfactory. In the course of field surveillance, cases of disregard towards taking proper safety precautions and other significant defects have been revealed and in some cases have been identified as extremely serious. For the better it has been noted that capabilities in and attitudes towards safety in companies have nevertheless developed positively although it has to be admitted there are still great differences between degrees of safety preparedness.

Last year we in TUKES directed a great deal of our energies towards setting up a new area of responsibility, namely those concerned with rescue service equipment. This new area of surveillance was enthusiastically taken on and set up. Certainly of no less importance was another area of accountability TUKES was

given; surveillance responsibility for CE-marked construction products.

Our development and surveillance operations progressed through individual project development programmes. The work TUKES did in the following cases will possibly give some idea of the scope of our undertakings last year. An electrical fire safety survey programme, A survey examining safety culture, A survey looking into the effects of the Seveso II Directive. Work was also undertaken through participating in the starting up of a process safety development programme.

During last year we also worked on developing and refining the actual tools we use in many facets of our operations. The tools for self-evaluation and operations auditing are a natural and familiar constituent of our functions. Through these we realise the fundamental principals we at TUKES sustain: constant learning and operational advancement.

Seppo Tuominen
Director General

TUKES REVIEW, published by Safety Technology Authority (TUKES), brings you current information about technical safety and reliability in Finland.

Founded in 1995, TUKES is a streamlined expert organisation and surveillance authority subject to the Ministry of Trade and Industry. We operate within the realms of process safety, pressure equipment safety, electrical safety, rescue service equipment, and legal metrology and articles of precious metals.

On the Internet, you will find us at <http://www.tukes.fi>.

TUKES REVIEW

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Review of TUKES' Operations in 2000

New tasks for TUKES

The operational environment of TUKES in 2000 was stable, as far as the internal market, industry, commerce and consumers are concerned. A number of statutory amendments brought new tasks for TUKES and changed some of our working methods.

The Ministry of the Environment authorised TUKES to supervise the market of construction products in Finland according to the EU Construction Product Directive as of the 1 September 2000. The surveillance mainly takes place as a result of notifications from consumers, building inspection authorities, competitors and other operators.

The Decree of the Ministry of Trade and Industry on the compulsory energy efficiency labelling of light bulbs and fluorescent lamps used at homes became effective on 1 November 2000. TUKES controls the labelling of light bulbs.

A new Act on articles of precious metals became effective on 1 January 2001, amending the requirements set for these articles. TUKES received more rights as a market surveillance authority.

As of 1 September 2000, a smoke detector became compulsory in every home and leisure-time residence in Finland. TUKES controls the quality of the smoke detectors sold.

Safety level remained stable

The target of TUKES is that the entrepreneurs pay serious attention to safety requirements in their operations, and that the number of accidents will continuously decrease. The points of emphasis include the equipment, plants and operations which are critical and most important to safety.

Process safety showed no significant change in 2000 as compared to the previous years. Accidents and near-misses still occurred in the branch. However, special attention has been paid to this in businesses and at TUKES. Businesses have set both long-term and annual targets in order to decrease the

number of accidents. A manual of accident research was introduced at TUKES in the beginning of the year. The new criteria presented in the publication increased accident research and collection of accident data.

Several target plants where chemicals, liquefied petroleum gas (LPG), natural gas or explosives are used introduced a safety management system. A functioning system with its methodology creates the prerequisites for an improved safety level. The development has been most positive in the largest businesses.

The level of pressure equipment safety remained good. Accidents and hazardous situations are rare. The majority of holders of the largest pressure equipment are aware of the importance of taking care of safety, and look appropriately after the condition of the equipment used. Shortcomings affecting the safety level were mostly found in small pressure equipment and pressure equipment used at chemical plants.

The safety of electrical installations is estimated to have remained at a reasonably good level. Among the large number of targets supervised there are still differences in the safety level, in the compliance of obligations and in attitudes. There are still quite a lot of defects in the compliance of new statutory duties, such as in the periodic inspections and in service and maintenance programmes. The initial inspection required in the current regulations has been one of the reasons for the higher quality of

electrical installations delivered by electrical contractors. However, electrical contractors are numerous and of various kinds, and so are their skills and attitudes.

In the branch of electrical safety, we had to record five fatal accidents. Of them, three involved a concrete truck boom or a detachable truck hood hitting an overhead powerline, one a relief farm worker touching a broken light switch, and one workers using a welding transformer. The number approximately equals to the latest 10-year average, but there was a clear increase from the previous year. As to elevators, we recorded one fatal accident which involved a person being wedged between a trolley and the elevator wall. In the last few years, this type of accidents have shown a slight increase, even if serious elevator accidents are still very rare.

TUKES paid 126 surveillance visits to inspection service providers and to different installation and service companies. These businesses were mostly in order, as the shortcomings mainly occurred in single cases or they were not of major importance.

A total of 215 accidents were reported to TUKES during the year, in which 11 people lost their lives. We nominated 17 researchers or research groups to investigate the serious accidents happened in our field of operations.

Accidents reported to TUKES in 1996—2000. The figures also include some near-misses.

Accident group	Number				
	1996	1997	1998	1999	2000
Electrical equipment	54	45	64	42	51
LPG	12	7	8	18	11
Dangerous chemicals	57	68	76	59	79
Elevators	8	22	14	13	12
Transportable gas containers	1	3	3	6	4
Pressure vessels	13	17	9	16	15
Explosives	1	2	5	5	3
Fireworks, home-made bombs and explosives	3	96	11	17,67*	34
Natural gas	1	3	6	3	1
Carriage of dangerous goods	4	7	18	11	3
Mining	1	-	2	-	2
Others	3	4	-	-	-
Total	158	274	216	190	215

*) Additional data from an investigation published by the Finnish Ophthalmological Society.

Number of fatalities in accidents in 1996—2000.

Accident group	Fatalities				
	1996	1997	1998	1999	2000
Electrical equipment	4	3	3	1	5
LPG	-	3	-	2	1
Dangerous chemicals	1	1	-	2	3
Elevators	1	-	1	-	1
Transportable gas containers	-	-	-	-	-
Pressure vessels	1	-	-	-	-
Explosives	-	-	2	-	1
Natural gas	-	-	-	-	-
Carriage of dangerous goods	-	-	-	-	-
Mining	1	-	-	-	-
Others	-	1	-	-	-
Total	8	8	6	5	11

Product conformity on the increase

The product characteristics subject to surveillance include safety, reliability, electromagnetic compatibility (EMC), and energy efficiency.

In 2000, there were no fatal accidents caused by electrical products. Not many serious accidents were recorded by other product categories either. Thus, the product safety and reliability is considered to be at a rather good level.

For electrical products, the relative proportion of products violating the requirements is decreasing. This proves that positive results can be achieved with combined national and international co-operation. The problematic category for electromagnetic compatibility is power electronics equipment for which we have not seen any essential changes as to the conformity. The legal energy efficiency labels, required of certain household machines on the market, are displayed better than before, but omissions are still found.

As to articles of precious metals, the legal surveillance did not face any fresh problems. Although the quality of marks has improved, there are still products which carry unclear marks.

The positive development of measuring instruments continued. The number of non-confirming fuel dispensers and oil meters was smaller than the previous year, but there are still certain problems with scales.

The number of defects noticed in simple pressure vessels and aerosol dispensers is on the decrease. The safety of gas appliances is at an acceptable level. However, the use of them involves risk factors which cause danger of accidents. Nearly all fireworks sold in our country

had been approved as provided by law, and they worked appropriately in test shootings.

Defects in rescue service equipment have been rare and mainly related to labelling and instructions. Safety-related shortcomings were mainly found in warm-air generators.

Development work in large-scale projects continued

In research and development, we emphasised the recognition of safety risks relating to electrical, chemical and pressure equipment safety, the assessment of safety levels, and the finding of solutions promoting safety. We focused our efforts on the usability of the results when targeting our surveillance and communication and in the assessment of the effects of TUKES' operations. The activity was based on co-operation with the operators in the branch. Particularly research work was purchased from research institutes or universities.

Other aims have included increased co-operation and the combination of resources. By way of example, we participated a special nation-level process safety development project and a co-operation project called Safety of Heating Oils and the Controlling of Environmental Risks.

The research programme of electrical fire safety proceeded as planned. In 2000, we implemented three subprojects in this field. The fire risk project investigated the most dangerous product groups and building types, at which advance prevention should particularly be directed. In the burning and extinguishing project we examined the time of fire development and the amount of heat and smoke generated in fires. The material project examined the state of the art of

fire-preventing materials, and looked for safer and environmentally more friendly alternatives. The project results are to be published in 2001.

The safety culture programme was continued, and studies on the safety culture in businesses and a study of consumers' attitudes and safety behaviour were published during the year. The relevant results have been presented in TUKES Publications Series.

In the project examining the enactment and effects of the SEVESO Directive in 1999—2001, we studied the awareness of the target businesses of the changed requirements and the effects of the statutory changes on their safety. The businesses were quite aware of the statutory changes, their attitudes to the changes are positive, and the changes have notably increased the participation of the management in safety issues and the staff's awareness of operational hazards. However, in three out of four businesses which are obliged to draw up a safety report, major steps are still to be taken to meet the regulations.

In order to estimate the safety of pressure equipment and to enact the new regulations, three projects were completed: The most dangerous types of pressure equipment, Guide for boiler plant risk assessment, and Guide to the Pressure Equipment Directive. The project results have been published in TUKES Publications Series.

As part of the strategy of the legal metrology, we completed a project named Reliability of the environmental measurements. The relevant results are used in the preparation of the reformation of the regulations affecting this branch. As for the reliability of measuring instruments, we also carried out a project reviewing the risks of measuring deviations of water and heat energy meters and the periodic verifications.

Also, a study of the first ten years of the EMC Directive in Finland was finished in 2000.

The development of TUKES' surveillance procedures and activities is based on internal assessment which covers all the levels of our organisation: management self-assessment, a variety of internal audits and personal performance assessments as part of the employees' pay system. A number of special in-house development projects were also carried out.

Consumer-targeted communications

The largest projects targeted to consumers and entrepreneurs addressed the issues of advance prevention of electrical fires, the use of fireworks, and the safety of liquefied petroleum gas.

To support the advance prevention of electrical fires, we produced new information material such as brochures, training material and websites. The largest effort was focused on publication of the informative pages "How to avoid an electrical fire" in ten widely-read magazines in September—November. Several magazine-related studies on the functionality of the pages showed top observation values.

The firework safety campaign "Protect your eyes against fireworks" was run at the turn of the year on TV and on outdoor billboards in towns. Reaching about 2.3 million Finns, this campaign showed excellent functionality, and succeeded well in giving the main message, the use of protective glasses, to the target group.

In our efforts to promote the safe use of liquefied petroleum gas, we had an outdoor advertising campaign "Get Rid of Carbon Monoxide by Ventilation". The measured attention values of the campaign remained remarkably lower than in the earlier TV campaigns. However, the campaign was still cost-efficient, and the main message, the importance of ventilation when using LPG, was understood rather well.

To promote children's knowledge of electrical safety, TUKES and ADATO Energia Oy published a new booklet on children's own electrical rules (*Lasten omat sähkösäännöt*) for children in preschool and primary school age. The Finnish Electrical Safety Promotion Association participated in the financing of the booklet, and paid for the delivery of the guide to nurseries.

New information material was made for electrical professionals, such as the self-assessment guide of electrical safety and a pocket manual on electrical safety regulations. In addition, we revised the

guide intended for importers and stores selling electrical products.

Information was still spread for business operators, e.g. on the changes in regulations on pressure equipment and on the handling of dangerous chemicals. We also communicated in numerous ways on the new requirements for rescue service equipment and articles of precious metals; with information sheets, at fairs, by lectures, and on websites.

Human resources

Man-years by Group

Group	1999	2000
Plant and Installations		
Surveillance	46	48
Product Safety		
Enforcement	31	31
R & D and Support		
Services	29	30
Total	106	109

Education

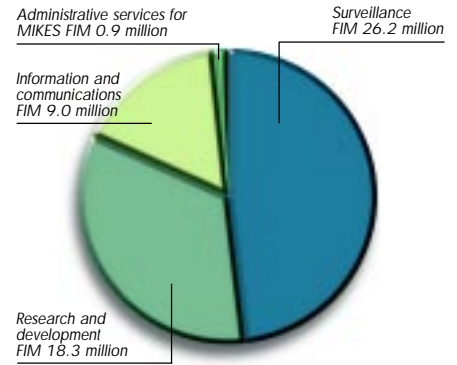
	Researcher	Graduate engineer	Other university	Polytechnic	Engineer	Other college or intermediate grade	Comprehensive school
1997	1	29	11	-	25	23	11
1998	5	27	10	-	27	30	7
1999	4	29	10	-	26	30	7
2000	4	31	13	1	25	30	9

Finance

Our total operating costs totalled FIM 55.7 million, and the income for services sold, other income and compensation FIM 9.4 million.

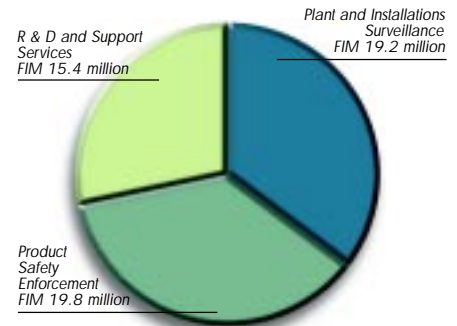
Expenses by main activities in 2000

(total FIM 54.4 million)



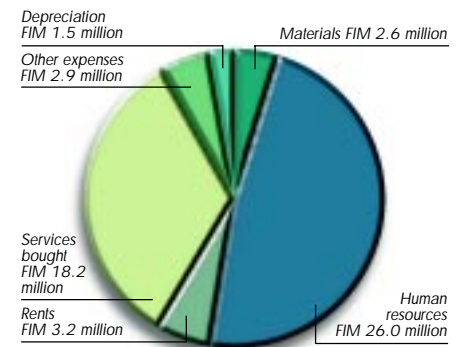
Expenses by Group in 2000

(total FIM 54.4 million)



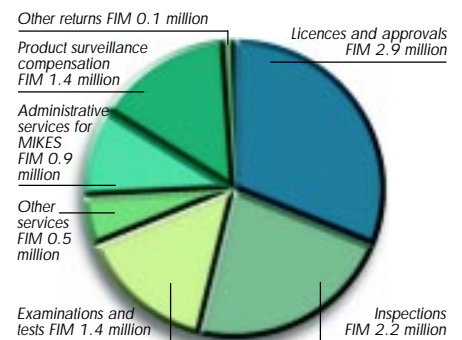
Expenses by item in 2000

(total FIM 54.4 million)



Returns and compensation in 2000

(total FIM 9.4 million)



Transition period of the Pressure Equipment Directive to end soon

The application of the Pressure Equipment Directive for the planning, manufacture and assessment of the conformity with requirements has been approved as of 29 November 1999. The transition period will end on 29 May 2002. Equipment manufactured after this period will have to comply with the new regulations.

The new regulations on pressure equipment will cause numerous changes. For example, the validity of the inspection certificates of construction plans will end on 29 May 2002 at the latest. In the manufacture of class II, III and IV pressure equipment a third party, i.e. a notified body or certification body, will approve the welders and welding methods. A welding technician or engineer employed by the manufacturer cannot be approved as a third party. Certain inspections carried out earlier by an inspection body can be replaced by the manufacturer's own quality system, duly assessed and approved by the relevant inspection body.

At least type 3.1.B material certificates should be provided for the main pressurised parts of class II, III and IV pressure equipment. In that case, a body located in the European Economic Area must also have certified the material manufacturer's quality system.

Accessories, such as valves and relief valves, are considered as pressure equipment and are therefore within the scope of the Directive.

The approval of inspectors according to section 4 of the former Pressure Vessels Act will end on 29 May 2002, and so will the validity of the TUKES approvals of testing bodies.

The Pressure Equipment Directive in Finnish and English and the Guide to the Directive have been published in TUKES Publications Series. The publications are intended for designers, manufacturers, importers, inspectors and authorities.

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Safety investigation helps to recognise the risk of accident

There are a little more than 80 factories or storages in Finland that handle dangerous chemicals, and are obliged to draw up a safety report according to the Decree (59/1999). Of them, about 60 were required for this already by earlier legislation. The plants were to draw up and deliver a safety report and an internal rescue plan to us by 1 February 2001. Most plants succeeded in doing this, but some reports and plans are still missing. The plants that were not bound by the obligation in accordance with earlier legislation shall forward the report to TUKES by 1 February 2002.

This year TUKES aims to send the conclusions related to the safety reports and internal rescue plans to the safety

report businesses by the end of the year. To start the process, statements of the reports will be requested from the municipal fire chief, the regional occupational safety district and the environmental centre.

When handling the safety reports, special attention will be paid to how the entrepreneur is able to prove that it has recognised and assessed the risk of accident related to its activity. It also has to prove it has prepared itself for them sufficiently both with technical means and with its safety management. The functionality of the safety management system will also be monitored on the periodic inspections to be carried out this year.

The procedures and preparedness presented in the internal rescue plans have to be suitable and sufficient for preventing accidents that may occur. Besides, the safety plans have to be compatible with the arrangements made by municipal rescue services.

The safety report should also give sufficient information for an external rescue plan to be made in the municipality. Information on the possible accident types in the plant and their affected areas and information on the plants own preparedness for the prevention of accidents are particularly important. For this, TUKES also delivers the safety reports receives to the municipal fire chief together with its own statement.



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Product Safety Enforcement

Safety defects in electrical products on slight decrease

In the 2000 market surveillance, we found serious defects in a few dozen equipment types. However, the overall safety level of products on the market has improved compared to the previous years. More products than before now passed tests either with fully acceptable results or with only minor defects.

Our inspectors paid more than 2600 surveillance visits to retail businesses and to manufacturers and importers. More than 900 electrical product types were delivered for testing because of suspected non-compliance with regulations. Two thirds of these passed the tests impeccably, or the defects were only small. However, a third, i.e. a little more than 300 of the tested product models had safety defects. Sales or delivery bans were ordered to many of these products.

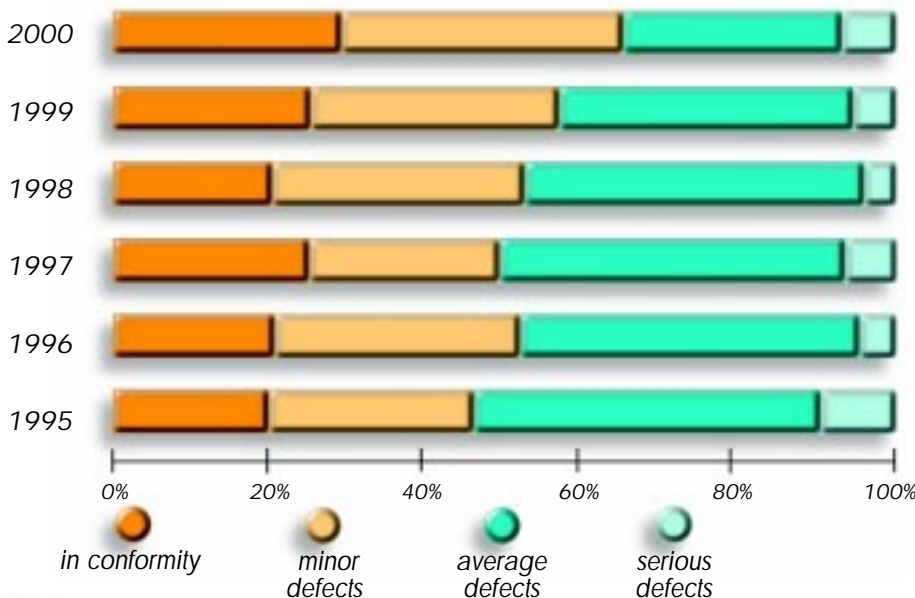
Of the defective products, 39 product types were so dangerous that the importer was obliged to recall the equipment already sold to the consumers, using appropriate advertisements or a customer register. The worst defects concentrated on a few product types. Of the most dangerous items, 28 were mobile phone charging devices, sold as accessories. A serious safety risk was also related with five lamps and three PC power sources.

Based on the results, the safety of electrical products on the Finnish market is improving. This applies to the legal energy efficiency labelling required of certain household machines as well. As far as electromagnetic compatibility (EMC) is concerned, the conformity with requirements remained at the same level as in the previous years.

Despite the surveillance, products that are not in compliance with European requirements continuously enter the Finnish market. The manufacturers and importers should concentrate more intensively on the conformity of the products before putting them up for sale. Should any electrical product be found to be dangerous only after its sales have begun, the importer or the manufacturer will face considerable financial losses. If for some reason the manufacturer or importer is not able to carry these responsibilities, they are transferred to the wholesale or retail sales level. Anyone placing a dangerous product on the market may also become responsible if the product causes damage or an accident.

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Surveillance of electrical products.
Safety test results in 1995—2000.



New legislation on articles of precious metals

The new Act (1029/2000) and Government Regulation (1148/2000) on articles of precious metals came into effect as of the beginning of 2001. The aim of the new legislation is to secure the benefits of the consumer, to increase the free mobility of products, to bring the legislation to the level required by the constitutional law and to harmonise it to comply with the draft EC Directive.

An article of precious metals (gold, silver, platinum) must have at least two marks stamped on it — a responsibility mark showing the entrepreneur in charge of the product, and a fineness mark indicating its precious metal content. In gold products, the minimum gold content has been decreased to 375 parts per thousand. The minimum precious metal contents in silver and platinum products have also changed. Gold and platinum products weighing less than 1 gram and silver products weighing less than 10 grams do not need any marks. However, these products must always comply with the legislative requirements. An article of precious metals may also have marks which denote the year and place of manufacture.

The assay and hallmarking of precious metal products by an impartial assay office is no longer compulsory. Whenever necessary, the person in charge of the products has to be able to prove their conformity by other means. The changes bring relief to the trade of these articles, but, at the same time, the manufacturer's and seller's responsibility for their products is strongly emphasised.

In the new legislation, TUKES received increased authority than before. We are now able to interfere more efficiently in trade with products that violate the regulations.

For the consumer, it is worth while asking about the product's characteristics and study the marks together with the salesperson. It is good to retain the receipts and any certificates given of the product.

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Changed sound frequency for smoke detectors

The tests carried out as part of our market surveillance revealed that smoke detectors did not comply with the sound frequency required by the Ministry of the Interior Regulation SM-1999-00256/Tu-33 (Publication A:59).

On the basis of the test results, TUKES suggested to the Ministry that the frequency requirement be changed. This was accepted and confirmed on 1 December 2000, the new sound frequency requirement being 0.3—3.5 kHz.



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Cement can be CE-marked as of 1 April 2001

The first Harmonised Standard (SFS-EN 197) in accordance with the Construction Product Directive has been completed. Part 1 contains the composition, specifications and conformity criteria for common cements, and Part 2 the evaluation of conformity.

The Standard's date of implementation is 1 April 2001, after which the CE marking can be used for cement. The implementation is followed by a one-year transition period, during which both the earlier national approval based on the Government Decision on Construction Cements (1404/1995) and the procedure to the new Standard can be applied. Cement manufacturers are free to choose the procedure until 1 April 2002. Thereafter, the earlier approach is no longer valid.



More Harmonised Standards enabling the use of the CE mark on various construction products are anticipated during the year. The Finnish Standards Association SFS will publish the Standards before they take effect. The next few years will see approximately 600 new Harmonised Standards on construction products. TUKES supervises that the CE marking is used correctly for construction products.

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New information on the extinguishing of fires caused by electrical equipment

A new research has been completed on the fire characteristics of electrical equipment and on the extinguishing of fires caused by them. The project was carried out as part of the research programme on electrical fire safety that started at TUKES in 1996. The aim of the project was to achieve new information on how to act if an electrical appliance catches fire. The study proved, among other things, that refrigerating equipment, washing machines (dish washers & clothes washing machines) and TV sets burn with high efficiency, generate a lot of dangerous smoke, and that the fire usually develops very quickly.

The results of the study are available as a summarised brochure "Burning characteristics of electrical equipment and extinguishing fires caused by electrical equipment".



TUKES opened its new website

The completely renewed TUKES website opened in February. The contents have been improved, and a great number of easy-to-navigate elements have added. Our clients can register themselves with a mailing list to get the links for the latest information sheets and media releases by e-mail. For easy ordering of our publications, we now provide a separate order form at our site.

Navigation on the site has been made easier by means of continuously visible location information and with a sitemap. On the front page, the main page levels are visible in the upper part of the page, the latest news being on the left-hand side. When moving on the pages of our branches, the news bar on the left-hand side changes into an information box. You are welcome to visit us at www.tukes.fi.

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