The European Group of Organisations for Fire Testing, Inspection and Certification

ANNUAL REPORT

2013

EGOLF members outside TECNALIA in Derio, Spain, October 2013.

Financial Report

	2013 €
INCOME	
Membership subscriptions	116,200
Courses	27,900
Other income	3,042
Total income	**147,142**
EXPENDITURE	
Secretary General	65,041
Executive expenses	9,125
Plenary & TC meeting costs	7,735
GNB FSG Secretariat	7,587
Round robins, courses & workshops	38,125
Website hosting & developments	4,340
Printing costs	4,336
Annual audit	2,160
Other expenses	4,127
Total expenditure	**142,576**

A view from the President

Dear Members, Partners and Stakeholders

My first words are to thank my friend Andrzej BOROWY from ITB, Poland, for his long service as a member of the Executive Committee and for his valuable contribution to EGOLF, and to welcome Paolo MELE from CSI, Italy, who has recently joined us on Executive. I should also like to thank Hendrik RADEMACHER of MPA NRW in Germany who has supported us as Chair of TC1 (Reaction to Fire) for several years and to welcome his successor Rupert EHRLENSPIEL of TUM/HFM in Germany. On the membership front, I welcome new members CTO from Poland and both TSE and Efectis ERA Avrasya from Turkey, all of whom joined us in 2013.

During the past year, EGOLF members have expressed their willingness to further extend the activities of EGOLF outside the borders of Europe. We have therefore been seeking organizations worldwide which have a similar mission and with whom we should like to form partnerships. After several months' investigation, however, we are fast coming to the conclusion that we are, indeed, rather unique. We need therefore to approach organizations which may not be similar but with whom we can pursue activities in common, with shared goals. I encourage all organizations of this kind to contact our Secretary General, Christine Roszykiewicz.

EGOLF's aim to support its members with additional training courses has met with success this year and for the first time we are able to offer a portfolio of training equal to our member's current needs. There is still a lot to do to meet future needs but the dynamism to produce new courses has never been greater. I am confident that our activity in this field will continue to grow this year.

Our main target as always is to maintain and develop the trust placed in the EGOLF brand. Wide recognition of top level players requires strong and demanding internal rules. Each year we are keen to raise the level of quality amongst the membership, in line with our continuous improvement policy. My sincere aim is to be able to keep on board all of our members without compromising this commitment.

I should also like to highlight here the growing number of requests received in the field of market surveillance. Although it is not part of our mission, I feel strongly that it is EGOLF's responsibility to deliver every possible support in the interests of improving market surveillance, so that as many "black sheep" as possible can be driven out of the market, for the benefit of safety, first, and secondly for the benefit of all professional players.

I hope that 2014 will allow EGOLF to shine even more, both within and outside of Europe, proud of its actions, proud of its members, and proud of its contribution to a more "Fire Safe World". Enjoy it!

it is my sincere hope that the future will be as exciting as the past few years.

Pascal Coget
EGOLF President

AUTHOR: Christine Roszykiewicz (EGOLF Secretary General)

PLENARY MEETINGS

Two plenary meetings were held in 2013, the first hosted by CSTB in Champs-sur-Marne, France, and the second by TECNALIA in Derio, Spain. During the first event, members welcomed guest speaker Juha Laitinen from the Finnish Institute of Occupational Health. Mr Laitinen presented the results and findings from a project on occupational health in fire situations. This will help to inform a questionnaire which EGOLF is developing on behalf of its membership, as awareness of health and safety issues in both the fire testing laboratory and office environments are given increasing importance.

A review of fire tests performed by EGOLF members in accordance with European test standards was also undertaken at that meeting, with a plan to increase the number of harmonisation courses being developed each year so that all of the most common tests are offered by 2015. Last year, a new General Course for Fire Laboratory Engineers was introduced. This covers heat transfer and other basic phenomena as well as the European systems for testing, classification and certification. More information about EGOLF harmonisation courses and workshops can be found in the EGOLF Course Catalogue which is regularly updated online at *http://www.egolf.org.uk/activities/harmonisation-courses.html*

An important topic during Plenary discussions in 2013 was Market Surveillance and the importance of ensuring that clients are fully briefed on what they can expect to obtain in the event of a successful test or classification report, in particular whether this will enable them to sell their product nationally or on a European wide basis. EGOLF has published Guidelines for Performing Assessments in lieu of Fire Tests (EGA 10rev1:2011) which can be freely downloaded from the Documents folder on the home page of the EGOLF website.

Visit to fire testing laboratory at CSTB, France.

Meeting of EGOLF TC4, Tecnalia, Spain.

A. Borowy (EGOLF Executive), C. Roszykiewicz (EGOLF Secretary General) and M. Walk (Head of CTO Fire Testing Lab.) in front of Neptune's Fountain in Gdansk.

TECHNICAL COMMITTEE MEETINGS

TC1 (Reaction to fire)

In 2013 a new EGOLF harmonisation course on CEN/TS 1187:2012 tm1 was launched at Kiwa BDA Testing in the Netherlands. This was developed by BDA in collaboration with Prüfinstitut Kiwa BDA in Germany. In addition to the numerous other helpdesk items posted to the EGOLF Helpdesk Forum last year, one question arising from this course led to intense discussion during the Autumn meeting. This concerned melted or burned material (EPS) and the need for a consensus as to how to define the damage. A discussion ensued as to the definition of pyrolysis and chemical breakdown by heat exposure and the fact that brown colour is not necessarily a proof of combustion, since discoloration can be due to higher temperatures or to the appearance of soot. It was agreed that the terminology in the test standard should be examined and, if necessary, an EGOLF recommendation prepared.

TC1 – Reaction to Fire **EGOLF Recommendations (EGRs) published in 2013** These are publicly available and can be downloaded at: www.egolf.org.uk/documents/egolf-recommendations.html	
EGR 72	EN ISO 1716: 2010 - validity of test results
EGR 73	TS 1187 TM2 and EN 13501-5 - interpretation of definitions
EGR 74	SBI - range of test sheets of PVC panels for wall covering
EGR 75	EN ISO 1716: 2010 - interpretation of "accuracy"
EGR 76	EN ISO 11925-2:2010 - aluminium foil tray
EGR 77	CEN/TS 1187:2012 tm1 - fastening at seams

Round Robins

In the framework of TC1 activities in 2013, a Round Robin was completed on CEN/TS 1187:2012 - External fire exposure to roofs with burning brands for test methods 1 and 2. This was organised by Kiwa BDA in the Netherlands, in collaboration with SINTEF NBL, Norway. Eighteen laboratories participated and a summary of the results is featured in this Report.

Last year also saw the launch of a Round Robin test on EN 9239-1, organised by Warringtonfiregent, Belgium, in collaboration with SINTEF NBL, Norway (now SP Fire Research AS, Norway). Draft results are expected in the Autumn of 2014. Prior to this, a RR on Classification and EXAP standards was completed in the context of TC2 activities.

TC2 (Fire resistance)

At the Spring meeting of TC2, Lars Boström was welcomed as the new chair. The meeting focused on an ever increasing number of helpdesk items addressed to the EGOLF helpdesk forum and to the outcome of a Round Robin on Classification, the purpose of which was to evaluate the ability of labs. to process the exact and complete field of application and associated classes (classification) from a test report. Thirty-two labs. participated and a large number of informal recommendations were the subject of a presentation to members at the Autumn meeting. Following on from this, a series of workshops are planned, commencing in 2014, in order to focus on ways in which EGOLF can help to facilitate the application and interpretation of EXAPs, for the benefit of both members and their clients. A public summary report on the outcome of this Round Robin will be made available once more formal recommendations have been agreed for the attention of CEN TC 127.

During the Autumn meeting of TC2, a report was presented to members on the results of a test carried out earlier in the year to investigate the different fabrication and fixation methods on a test specimen exposed to the standard fire curve as described in EN 1363-1:2012. Two tests had been conducted by 16 participating labs.. This turned out to be a very interesting exercise, leading to an EGOLF recommendation (EGR 78) on how to ensure that insulation pads used have the same characteristics.

TC2 – Fire Resistance **EGOLF Recommendations (EGRs) published in 2013** These are publicly available and can be downloaded at: www.egolf.org.uk/documents/egolf-recommendations.html	
EGR 78	EN 1363-1: 2012 - fabrication and fixing of thermocouples
EGR 79	EN 1634-3:2004 - Sa + Sm - Indistinctness
EGR 80	Edge effect during fire test of loadbearing constructions

TC4 (Accreditation, Certification and Inspection)

During the Autumn meeting of TC4, the Committee focused attention on EGOLF's standing as a quality label, in face of increasing numbers of new applicants and the importance of maintaining our reputation for quality and harmonisation, for which the Association is rightly proud. In 2014 it is proposed to introduce a set of rules which clearly define the Minimum Entrance Level required for new applicants. This will include the size of furnaces available, specific equipment and facilities, compliance with EGOLF Agreements, Guidelines and Recommendations and a pro-active involvement in the organisation of courses, workshops and Round Robins.

EXECUTIVE MEETINGS

In October, Executive were delighted to welcome Paolo Mele of CSI (Italy), as a new member of the Committee, replacing Andrzej Borowy, ITB (Poland), who retired from office after serving a period of nine years on the Committee.
The focus of the meeting early in 2013 concerned the review of increasing numbers of applicants for membership. This led to a detailed review of EGOLF's definition of independence and ways in which fire testing laboratories are expected to demonstrate their integrity and impartiality. In conclusion, the membership welcomes new applicants who in future will be asked to disclose their ownership (shareholders) and the nature of the relationship with their owners, and to make this information clearly accessible on the EGOLF website.

EGOLF Appointments

Executive Committee (Conseil de Gérance) – Paolo Mele, CSI (Italy), was appointed to serve an initial term of three years.

Chair TC1 Reaction to Fire – Rupert Ehrlenspiel, TUM (Germany), was appointed to serve an initial term of three years.

Internal Auditor – Massimo Dinale, RINA S.p.A. (Italy) was appointed to serve a term of three years.

President of EGOLF – Pascal Coget, Efectis France, was re-appointed in March 2013 for a further term of three years.

Executive Committee (Conseil de Gérance) – Gary Blume, MPA Braunschweig (Germany) was re-appointed in March 2013 to serve a further term of three years.

Chair TC4 Certification, Accreditation and Inspection – Gert van den Berg, Efectis Netherlands, was re-appointed in October 2013 for a further term of three years.

EGOLF Workshops and Harmonisation Courses – Autumn 2014

Test Method	Standard	Location and date	Course fee for EGOLF members	Registration contact
AUTUMN 2014				
Floorings	EN 9239-1	6th October SP (Sweden)	650€ or 2600€ (all RtF courses)	Linnea Hemmarö linnea.hemmaro@sp.se
Ignitability of building products – single flame source test	EN 11925-2	7th October SP (Sweden)	650€ or 2600€ (all RtF courses)	Linnea Hemmarö linnea.hemmaro@sp.se
Single burning item	EN 13823	8th October SP (Sweden)	650€ or 2600€ (all RtF courses)	Linnea Hemmarö linnea.hemmaro@sp.se
Single burning item + Determination of heat of combustion	EN 13823 + EN ISO 1716	9th October SP (Sweden)	650€ or 2600€ (all RtF courses)	Linnea Hemmarö linnea.hemmaro@sp.se
Non combustibility	EN 1182	10th October SP (Sweden)	650€ or 2600€ (all RtF courses)	Linnea Hemmarö linnea.hemmaro@sp.se
External fire exposure to roofs with burning brands	TS 1187-2012 TM2	11 November 2014 SP (Sweden)	650€	Kaisa Kaukoranta kaisa.kaukoranta@sp.se
External fire exposure to roofs with burning brands	TS 1187-2012 TM1	12 November 2014 Kiwa BDA Testing (Netherlands)	650€	Albert Hameete Albert.hameete@kiwa.nl

** EGOLF copyright fee for each course is €200 (members) or €500 (non-members)*

CENTRUM TECHNIKI OKRĘTOWEJ S.A., POLAND

Authors: Sebastian Ukleja and Helena Modrzejewska, CTO S.A., Poland

Ship Design and Research Centre S.A. (abbreviated in Polish as CTO S.A.) is located in Gdansk. Its involvement in applied research has made a significant contribution to increased innovation in ship and construction design, both in Poland and worldwide. In recent years, activities have significantly expanded and diversified with the introduction of research services targeted at other industries, in particular the construction and civil engineering sector and industrial implementation of high-tech solutions.

Originally focused on the shipbuilding industry, CTO S.A. has transformed into a modern, multi-disciplinary research and development centre, recognized and esteemed in many countries around the world. Our R&D department is classified as a research organisation according to Polish Law and also according to EU Commission Regulation (EC) No 800/2008. We have been participating in many research projects nationally and internationally within EU Framework Programmes and ERA NET initiatives. One aspect of CTO S.A. activities is centered on fire research and testing of building and maritime structures. The Fire Testing Laboratory, which was established in 1971, is an important part of the Company. With over 40 years' of experience, it offers broad expertise for both the construction and shipping industry. We are listed by the International Maritime Organization (IMO) as one of the Recognized Test Laboratories which are acknowledged for fire testing activities on behalf of the maritime sector. In addition, our laboratory is the only one in Poland which is equipped for fire resistance testing of maritime structures according to Part 3 of the International Code for the Application of Fire Test Procedures (IMO FTP Code, 2010) and we also perform tests according to Parts 1-2 and 5-9 of the FTP Code. Furthermore we specialize in the testing of fire resistance and reaction to fire of building materials and hence are accredited by the PCA (Polish Accrediting Body) according to EN ISO/IEC 17025 and have become a Notified Body of the European Commission for fire resistance testing (NB 2434). Additionally, we are recognised by BV (Bureau Veritas) as well as by VKF (Association of Public Building Insurance Companies) and FBT (Construction Technology

Commission) in Switzerland. We are active members of the national sections of IMO committees (SSE - Ship Systems and Equipment and MEPC - Marine Environment Protection Committee) and the Technical Committee on Fire Safety of Buildings within the Polish Committee for Standardization.

Main equipment includes two modern fire resistance furnaces (vertical and combined vertical and horizontal one). We have various material testing rigs and a new chamber for smoke control doors and shutters. Furthermore we offer some unique fire testing capabilities, for instance fire resistance of secure storage units according to European standards EN 1047-1 and/or EN 15659. We perform fire resistance tests of fire barriers in railway applications according to EN 45545-3 and we can test the resistance to brushwood fire of road traffic noise reducing devices according to EN 1794-2, Appendix A.

Apart from regular fire testing we take an active part in R&D activities such as implementation of new testing methodologies and collaboration with industrial partners, both nationally and Europe wide, in the design of new products related for both the building and the maritime sectors.

Our team offers many years of practical experience in the area of fire testing and comprises a number of experienced engineers (some with more than 30 years' experience) and two PhDs with backgrounds in chemistry and fire dynamics. With such a strong team, we are able to perform numerous tasks efficiently for the greater benefit of our clients and research partners.

EFECTIS ERA AVRASYA – Member of Efectis Group

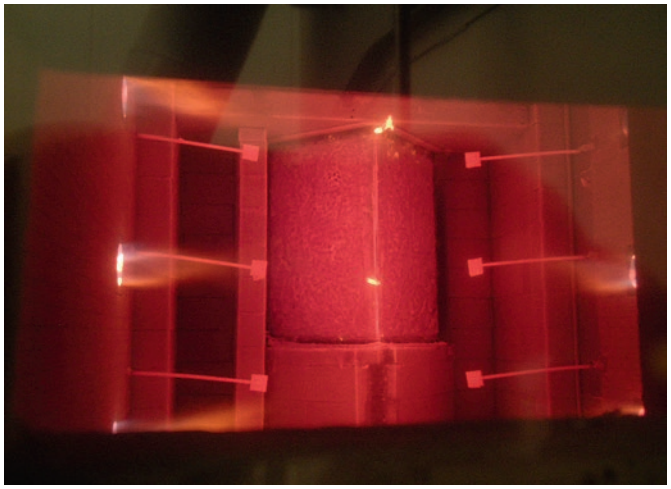
Author: Ali BAYRAKTAR – Efectis Era Avrasya, Turkey

When Efectis Era Avrasya established the first fire resistance laboratory in Turkey in 2011, the aim was to raise awareness of fire safety as a primary mission. As the subsidiary of the Efectis Group responsible for operations in the Middle East, Central Asia and the Balkan regions, it is one of the leading multi-dimensional businesses focusing on fire safety, with activities which comprise CE marking, Safe4Fire Product certification, fire tests, consultancy and training
Having launched its consultancy and certification services at the beginning of 2003, the reaction to fire laboratory was established in 2008 followed by the first fire resistance laboratory of Turkey in 2011. Today, Efectis Era Avrasya operates both nationally and internationally. Our experienced technical staff, auditors and trainers are supported through

a partnership with ERA Yonetim Test and Certification Ltd and ERA Laboratories Inc..

Due to increasing demand, work load and investment in a new fire resistance test laboratory, the company recently moved its reaction to fire test laboratory from Istanbul to the industrial zone located in Gebze, within the border of Kocaeli city on the Asian side of Istanbul. This move was more convenient for customers because of its proximity to their premises and to Sabiha Gökçen Airport.

Efectis Era Avrasya's extensive testing facilities allow us to carry out almost any type of fire test. These vary from standardized tests to determine the fire class of materials, or the fire resistance of separating and load-bearing structures, to tailor made tests in our facilities or on sites specified by our clients. Efectis is accredited to perform fire tests on components, products and structures used in the construction industry, infrastructure and marine sectors (IMO).



Within the scope of the laboratory:

- Reaction to fire tests and many other combustibility tests for automotive/railway vehicles interiors and textile products.
- Resistance to fire tests for both construction elements and service installations
- Fire tests and analysis for tunnel fire safety
- R&D studies for fire safety carried out by both universities and private sector

We make an important contribution to the construction market of Turkey in the scope of CE marking as European Notified Body No. 2184.

In addition to fire testing, Efectis Era Avrasya is leading the way as an innovative pioneer in Turkey by establishing a new laboratory for testing and the future certification of medical products. Efectis Era Avrasya has been gradually improving fire safety awareness in Turkey by growing its reputation in both the private and public sectors, helped by its partnership of the Efectis Group which has more than 60 years' experience in fire safety.

In order to respond to the needs of manufacturers to demonstrate the safety and quality of their products in face of unfair competition which offers cheaper, poor quality products on the market, Efectis Era Avrasya has launched the Safe4Fire Product Certification service. With this service, leading manufacturers' products will be under the guarantee and certification of Efectis Group and this will qualify them as "approved and demanded marks" on the market. With Safe4Fire Product Certification we follow-up the product from design phase to installation and control the continuity of fire resistance characteristics of the product. In addition, the performance of Safe4Fire service scope will benefit from the experience of all members of the Efectis Group and its position as a third party institute.

Efectis Group's latest service, Safe4Fire Building Certification, based on our vast experience and know-how, is aiming to fill a large gap in the market by ensuring fire safety for buildings such as industrial facilities, shopping centres, hospitals, schools and all kinds of construction. Safe4Fire is a set of services and a certification model for these constructions. With this unique service, buildings will be under Efectis Group's control and further advantages in safety, insurance and relevant issues will be provided for those involved in construction and post-construction phases.

As can be appreciated, the evaluation, reporting and prevention of fire risks by an expert unit plays a significant role in minimization of probable loss of life and property during a fire. Efectis is justifiably proud of being a first in the world with this peerless service and certification module and has simultaneously launched Safe4Fire Building Certification in all of its group locations including France, Holland, Turkey, Qatar, Dubai and North America.

Efectis Era Avrasya is aware that the added value for customers is not only the support it offers to the company and its products but also to its national economy.

TURKISH STANDARDS INSTITUTION, TURKEY

Author: Metehan Çalış, TSE, Turkey

Turkish Standards Institution (TSE) is a non-profit public enterprise that has a seperate legal entity and is managed in accordance with private law provisions in Turkey. Since 1964, TSE has provided testing services in 18 accredited test laboratories located in 10 different premises that offer the widest scope of expertise and are equipped with the latest technology.

All laboratories implement the quality management requirements described in EN ISO IEC 17025.

TSE's spectrum of activities is divided into six main areas: (a) Standard Preparation, (b) Certification of Products, Services, Information Technologies, Systems and Personnel, (c) Supervision and Inspection, (d) Laboratory Services; Testing and Calibration, (e) Automotive Services and (f) Training Services. These are covered by separate autonomous departments of the main organization.

FIRE LABORATORIES

Besides some active fire protection testing facilities, TSE currently has three laboratories involved in passive fire protection and a forthcoming project which aims to offer the largest testing scope in the region:

- Izmir explosion proof Lab. (Reaction to Fire)
- Kayseri Integrated Tests Lab. (Fire Resistance)
- Gebze Electrotechnical Test Lab. (Fire reaction tests for cables)
- Tuzla Project (under construction) (reaction to fire, fire resistance, fire tests in transportation systems)

Since 1990 the laboratory located in Izmir has provided services to the construction industry in

the framework of the recently introduced CPR. The laboratory is accredited for performing the following test methods: EN 13823 (SBI), EN ISO 1716 (calorific value), EN ISO 9239-1 (radiant panel), EN ISO 1182 (non-combustibility), EN ISO 11925-2 (single flame source), ENV 1187 Test 1 (roof).
Kayseri Laboratory, established in 2012, is able to perform standard fire resistance tests with one vertical furnace. The laboratory is accredited in the methods described by the following standards; EN 1363-1, EN 1634-1, EN 81-58, EN 1364-1 and 13501-2. Both Izmir and Kayseri Labs. are EC notified bodies.

TUZLA PROJECT

Because of the lack of adequate laboratories in the region, in the field of fire safety and acoustics, it was decided that TSE should invest in a laboratory which could offer a broad scope of fire testing services. This is referred to as the Tuzla Project. The project commenced in 2010 with the aim of meeting the current and future needs of fire and acoustic testing services in the construction materials, maritime, railway, aviation, house appliance and energy sectors. Within a short time span, the laboratory will have gathered reaction to fire, fire resistance, acoustics, thermal insulation and water-proofing tests in a single centre.

The project has a 7400 m^2 construction area and a total budget of approximately 15 million Euros. The expected launch date is the end of 2014. The laboratory is located in the eastern side of Istanbul where the Turkish business sector is mainly based.
Under **the fire resistance division** there is one 4 m x 3 m vertical furnace, one 6 m x 4 m combi furnace that combines horizontal and vertical capabilities in the same design, and one 1.5 m x 1.5 m indicative furnace for R&D purposes. All furnaces will have loading equipment. Also a 3 m x 3 m smoke leakage furnace for smoke control tests will be in service.
Reaction to fire division is going to include all EN 13501-1 devices and some other IMO, railway and aviation equipments. According to 13501-1, we test all kinds of building materials such as linear pipe insulation products, electricity cables, roofing products, rolling stock, aviation, plastics and coatings (building). For maritime materials, IMO FTP Code tests can be conducted. Furthermore, fire protection on railway vehicles (according to EN 45545) and Federal Aviation Regulation (according to FAR 25.853) tests will be available in this laboratory.

TREATMENT UNITS

During the design phase, environmetal protection was considered a top priority. For that reason a custom built chimney and treatment system was installed.
Acoustics department of the laboratory consists of airborne and impact sound insulation test rooms with time saving moving test frame solutions and a reverberation room for all sound absorption testing and power level measurements.
T**hermal Insulation and Waterproofing Systems Departments** include External Thermal Insulation Composite System (ETICS) components, Thermal insulation products, Adhesives and Plasters for insulation boards and thermal insulating mortars according to national and harmonized european standards.
In conclusion, TSE, one of the biggest role players in the conformity assessment market in the region, is proud of being member of EGOLF and pleased to invite members to the Autumn meeting of EGOLF in 2015 which will be held in Istanbul, Turkey.

Quality is a lifestyle…

EGOLF Round Robin on test 1 and 2 in CEN/TS 1187

Test methods for external fire exposure to roofs

Author: Anne Steen-Hansen, Research Manager SP Fire Research AS, Norway.

INTRODUCTION

CEN/TS 1187:2012 Test methods for external fire exposure to roofs is a European technical specification containing different fire test methods. Test 1 is the former German test method (test with burning brands), while test 2 is the former Nordic test method (test with burning brands and wind). The test methods are shown in the photos below.

Testing according to CEN/TS 1187 test method 1. The left photo shows the burning wood wool basket placed on a test specimen of roofing on a substrate of thermal insulation material. The right photo shows testing according to the method during an EGOLF harmonisation course at Kiwa BDA Testing B.V in 2013.Photos: Kiwa BDA Testing B.V.

Testing according to CEN/TS 1187 test method 2. The left photo shows the test apparatus and the burning wood crib being placed on a test specimen. The right photo shows the burning crib on the specimen during test. Photos: Thor Kr. Adolfsen, Norwegian Fire Protection Association.

EGOLF performed a round robin exercise on the CEN/TS 1187 test 1 and 2 during 2013. The tests were performed during the Spring 2013, and the final public summary report was published on EGOLF's website in May 2014.

ORGANIZATION AND PARTICIPATION

The round robin was organized by Albert Hameete, Kiwa BDA Testing B.V., the Netherlands, and Anne Steen-Hansen, SINTEF NBL (since 2014 SP Fire Research AS), Norway. Kiwa BDA Testing organized the distribution of test specimens and test instructions, while SINTEF NBL analysed the test results. The General Secretary of EGOLF organized the receipt of test results from the laboratories and distribution to the project group, to ensure that no laboratories could be identified in the analysis process.
18 laboratories took part in the round robin exercise:

- 16 laboratories tested according to test 1
- 10 laboratories tested according to test 2
- 8 of these laboratories tested according to both methods

PURPOSE OF THE ROUND ROBIN

The aims of this round robin exercise were:

- to confirm that EGOLF laboratories are able to perform test 1 and 2 of CEN/TS 1187 in a proper way
- to provide information about the reproducibility and repeatability for CEN/TS 1187 test 1 and 2
- to give an indication for each participating laboratory regarding its performance when performing tests according to CEN/TS 1187
- to provide an indication of the variability in equipment, procedures and tools

TESTED MATERIAL

The same 4 combinations of products were tested in both test 1 and test 2:

- Sample 1: PVC roof waterproofing sheet on a substrate EPS, with a glass fleece layer in between.
- Sample 2: PVC roof waterproofing sheet on a substrate of mineral wool.
- Sample 3: Bitumen roof water-proofing sheet on a substrate of EPS.
- Sample 4: Bitumen roof water-proofing sheet on a substrate of mineral wool.

No specific instructions were given regarding the use of mechanical fasteners for roofings in the tests.

TEST PROCEDURES

The tests should be performed according to the descriptions given in CEN/TS 1187. Information on this and how the results should be reported was sent to the participants before the testing was started.

TEST RESULTS – METHOD 1 WITH BURNING BRANDS

All measured test results from test 1 according to clause 4.8 in CEN/TS 1187 were reported:

- External fire spread upwards
- Internal fire spread upwards
- External fire spread downwards
- Internal fire spread downwards
- Maximum burned length external
- Maximum burned length internal
- Burning material falling from the exposed side?
- Burning material penetrating the roof construction?
- Single opening area
- Sum of opening area
- Lateral fire spread to edges of measuring zone?
- Internal glowing combustion?
- Maximum radius of fire spread, external and internal

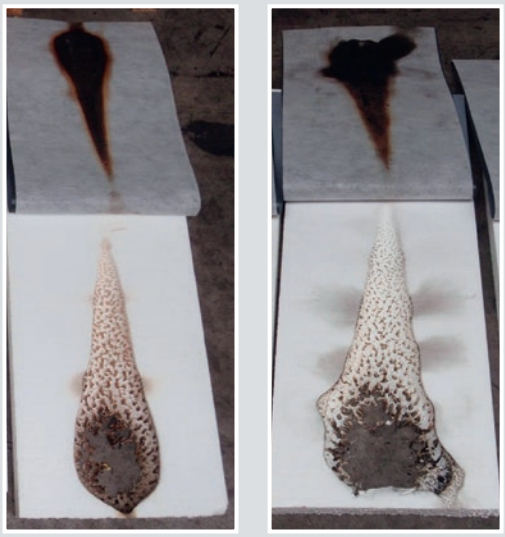
Photos of damaged specimens of the four material combinations are shown below. All photos are taken by one of the participating laboratories.

Test method 1, Sample 1: *PVC roofing on EPS insulation with glass fleece between the layers. The photos show typical damaged specimens. Damaged roof water proofing material to the left, damaged EPS insulation to the right.*

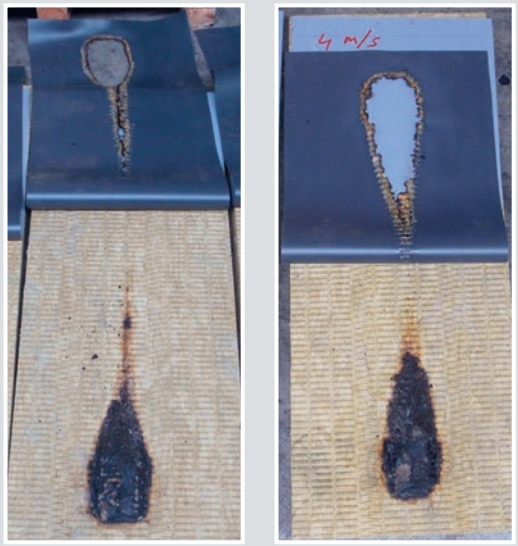
Test method 1, Sample 2: *PVC roofing on mineral wool insulation.*
The photos show typical damaged specimens. Damaged roof water proofing material to the left, the surface of the damaged mineral wool insulation in the middle, and the profile of the damage through the mineral wool to the right.

Test method 1, Sample 3: *Bitumen roofing on EPS insulation. The photos show typical damaged specimens. Damaged roof water proofing material to the left, damaged EPS insulation to the right."*

Test method 1, Sample 4: *Bitumen roofing on mineral wool insulation.*
The photos show typical damaged specimens. Damaged roof water proofing material to the left, damaged mineral wool insulation to the right.



Test method 2, Sample 1: *PVC roofing on EPS insulation with glass fleece between the layers. The photos show typical damaged specimens, the roofing is folded backwards and we see the underside of the roofing in the upper part of the photos. Specimen tested at wind speed 2 m/s to the left, and at 4 m/s to the right.*



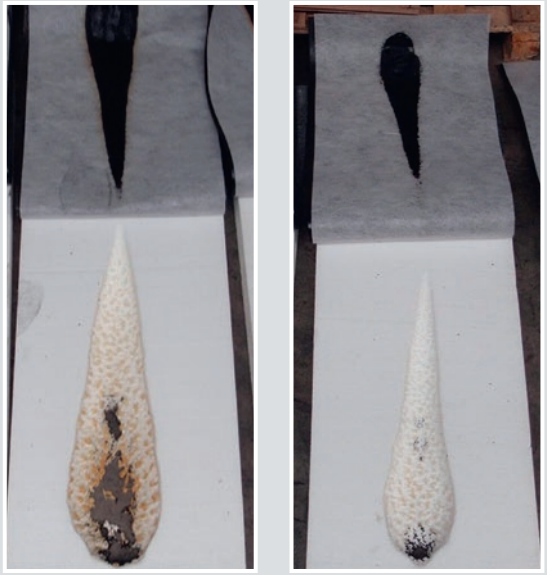
Test method 2, Sample 2: *PVC roofing on mineral wool insulation. The photos show typical damaged specimens, the roofing is folded backwards and we see the underside of the roofing in the upper part of the photos. Specimen tested at wind speed 2 m/s to the left, and at 4 m/s to the right.*

TEST RESULTS – METHOD 2 WITH BURNING BRANDS AND WIND

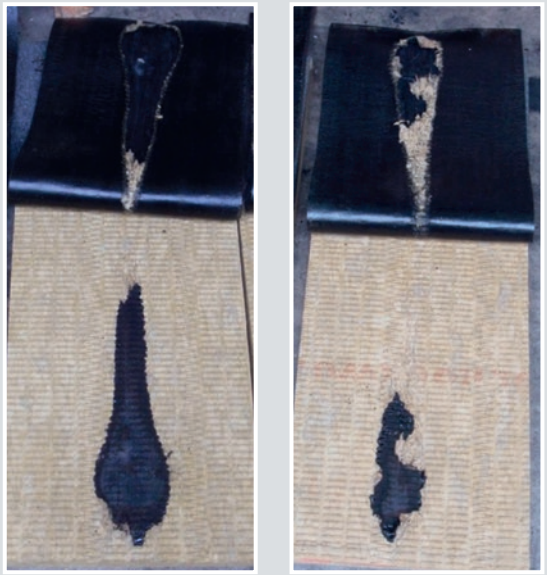
All measured test results from test 2 according to CEN/TS 1187 were reported, at wind speeds 2 and 4 m/s:

- Extent of damage in the roof waterproofing sheet
- Extent of damage in the substrate
- Maximum extent of damage in the roof waterproofing sheet
- Maximum extent of damage in the substrate

Photos of damaged specimens of the four material combinations are shown below. All photos are taken by one of the participating laboratories.



Test method 2, Sample 3: *Bitumen roofing on EPS insulation. The photos show typical damaged specimens, the roofing is folded backwards and we see the underside of the roofing in the upper part of the photos. Specimen tested at wind speed 2 m/s to the left, and at 4 m/s to the right.*



Test method 2, Sample 4: *Bitumen roofing on mineral wool insulation. The photos show typical damaged specimens, the roofing is folded backwards and we see the underside of the roofing in the upper part of the photos. Specimen tested at wind speed 2 m/s to the left, and at 4 m/s to the right.*

STATISTICAL ANALYSIS

The reported observations and test results represent the basis for analysis of the performance of the different laboratories. The statistical analysis was performed according to ISO 5725:1994/ Corr 1 2002. Accuracy (trueness and precision) of measurement methods and results. Test results identified as outliers were removed from the test results before repeatability and reproducibility were determined.

ASSESSMENT OF THE OUTCOME OF THE ROUND ROBIN

The round robin exercise has shown that most of the participating EGOLF laboratories will obtain results within acceptable limits when testing according to CEN TS 1187, test method 1 and test method 2. However, the repeatability and reproducibility of method 1 is assessed to be relatively low.

For both methods it has been found that there is a need for specific instructions and training in determining some of the test results based on observations. It could also be useful to propose changes to the technical specification CEN/TS 1187 that will help to avoid unnecessary variations in test results. EGOLF will notify the standardisation committee CEN/TC 127 Fire Safety in Buildings about topics that should be investigated in connection with a revision of the technical specification CEN/TS 1187.

SP Fire Research - activities and resources

Authors: Björn Sundström, Director SP Fire Research and Paul Halle Zahl Pedersen, CEO, SP Fire Research AS

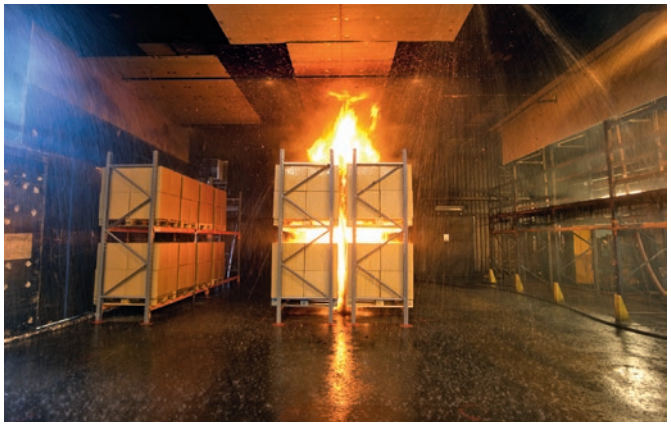
SP Fire Research is a fusion of SP Fire Technology and SINTEF NBL, the Norwegian Fire Research Laboratory. SP Technical Research Institute of Sweden owns a 70% majority of SINTEF -NBL since the first of January 2014 when both the fire organisations changed names to SP Fire Research. SP Fire Research AS in Norway is incorporated and represents national Norwegian expertise in official channels as before. SP Fire Research (both in Sweden and Norway) is a global organisation that is active in research, FSE (Fire Safety Engineering), support to national and international legislation, off-shore safety, risk assessment, testing, certification, inspection and so on. Both parts of SP Fire Research have a history of growth and by the end of 2014 we plan to have a staff of approximately 130. Scientific activities are quite integrated, including a research team of about 50-60 engineers, with some 20 PhDs and 5 professors. Recently SP Fire Research finalized an expansion of office and laboratory space in Borås. The increase is about 1000 m^2 and comprises 32 offices, numerous meeting rooms and a 6th laboratory.

SP Fire Research new office and laboratory building in Borås.

SP Fire Research AS in Trondheim.

LARGE SCALE EXPERIMENTAL RESOURCES

Experimental facilities include two large experimental fire halls: 18 m x 22 m with a maximum ceiling height of 19 m (Sweden) and 36 m x 16,5 m with a maximum ceiling height of 28 m (Norway). The Swedish fire hall includes a large scale fire calorimeter capable of measuring 15 MW peak heat release rate. These halls are suitable for testing and research relating to commodities, active fire protection (e.g. water mist, sprinklers, extinguishing gases), vehicles, building structures, tunnels and so on. The height of the Norwegian fire hall makes it especially suited for large scale tests of active suppression systems.



Test of sprinkler system for a warehouse.

The fire hall in Norway.

TESTING AND CERTIFICATION OF FIRE PROPERTIES

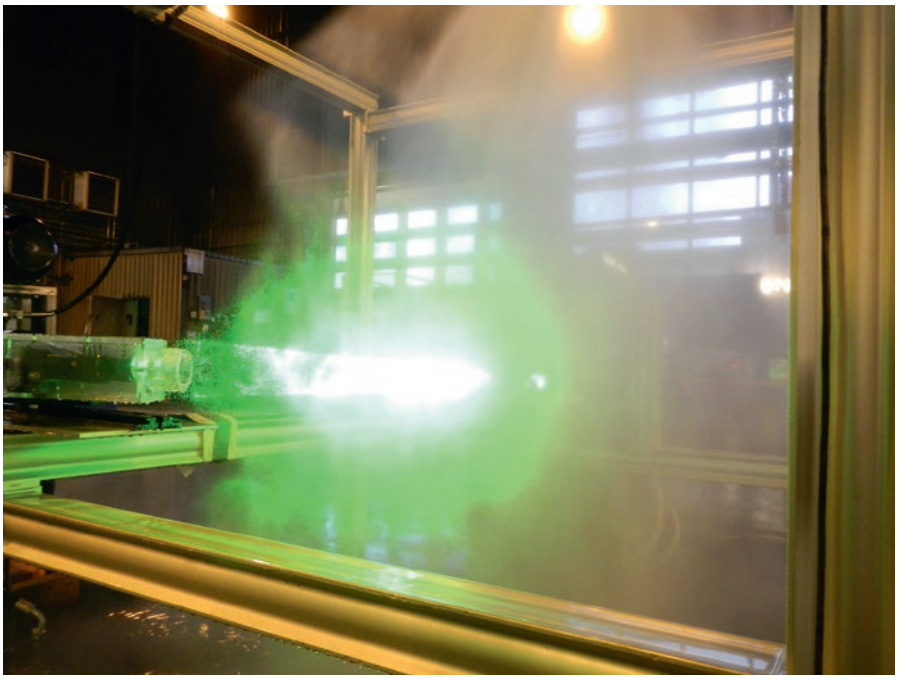
We hold accreditation for approximately 100 test methods for reaction to fire and fire resistance. We have the laboratory facilities and expertise for testing building products according to the CPR (Construction Product Regulation) including CE-marking certification when required. The laboratory in Trondheim also has the ability to certify products for the Norwegian building market. The Norwegian laboratory is also specialized in product testing for the marine and offshore sector and is notified for issuing certificates according to the Directive on Marine Equipment (MarED).

Furnace hall for fire resistance testing.

The SBI (Single Burning Item).

RESEARCH & DEVELOPMENT

Research fields include active and passive fire protection in buildings, tunnel fire safety, industrial fire safety, transportation, fuel storage safety, shipping, reaction to fire. In recent years this has branched out to include complex fire characterization (modelling of various phenomena), sustainability, risk assessment and resilience, tactical response and human behaviour. We are active in a variety of national and international projects including, e.g. the following EU projects: Fire-Resist, SafePellets, Adam4Eve and DEROCA. An exciting new technology is laser measurements of flow fields, for example for application to the characterisation and optimisation of water mist, using PIV. This methodology is also used increasingly to verify CFD calculations of smoke flow.



PIV, a laser measurement technology for determining detailed information of particles in a flow field.

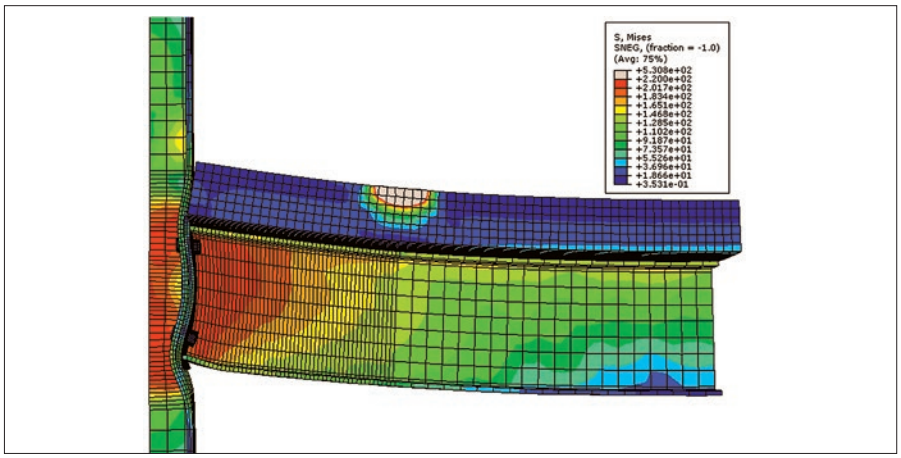
A fast growing area is off-shore. We were recently awarded a large project (OffshoreVäst) aiming at supporting safety in developing energy production and raw material extraction at sea.

Jet fire test for offshore constructions.

Åsgard, a Norwegian oil and gas platform.

EDUCATION

SP Fire Research is increasingly involved in education which includes running university courses, tutoring PhDs, developing a variety of practical courses, for example in fire investigation, CE-marking, EGOLF harmonisation courses for testing etc. In Norway, specific course packages are given for the off-shore industry. We co-operate with the Lund University, Luleå University of Technology and Mälardalen University providing courses in heat transfer, CFD, and fire dynamics for students taking courses in fire safety engineering. A textbook/handbook about fire dynamics for tunnels and underground constructions is presently being developed and will be published in 2014.



Thermo-mechanical modelling of a structure

EGOLF

EGOLF has a very important role in maintaining high quality in testing, dissemination of research results, developing test procedures and so on. We are proud to be active in EGOLF with our colleagues in the rest of Europe. Apart from the official meetings, we also co-operate in EGOLF courses, round robins and more. Anne Steen Hansen is a member of the executive of EGOLF and Lars Boström is chairing TC 2 for fire resistance.

EGOLF members on course.

More Fire Research Needed!

Author: Anne Steen-Hansen, Research Manager SP Fire Research AS, Norway

In January 2014, SP Fire Research had a meeting with the Norwegian Ministry of Justice to discuss the need for more public funding of fire research in Norway. We gave a presentation about several areas within the fire safety area where knowledge is limited, or even not available. These areas include among others fire safety in buildings, industry, transport, the petroleum sector, and also fire investigation and basic research on fire phenomena fire. This is not an exclusive Norwegian problem but a problem for many nations worldwide – the focus on fire research is insufficient.

Fire protection of cultural heritage, including towns with densely built wooden houses which is a special Norwegian example, was one of the topics we presented. The representatives from the Ministry of Justice listened very carefully to our presentation and asked several relevant questions during the meeting. It was clear that some of the information we presented was new to them. We feel that our visit was very useful for both us and the Ministry of Justice, and our hope is that Norwegian funding of fire research will be more prioritized in the future.

The day after this meeting our message to the authorities was illustrated only too clearly. In the evening of the 18th of January 2014 a fire started in a private home in the Lærdal municipality in the western part of Norway. There was a strong wind this night, and the fire spread quickly to other houses in the area. The fire lead to a heavy shower of glowing sparks and flying brands, and spread from house to house and also to the vegetation in the hillsides around the settlement. There was a huge risk that the fire would spread to the large area with cultural heritage wooden buildings from the 17th and 18th centuries. Several fire brigades, the Civil Defence, Red Cross and many private volunteers did a tremendous effort to control the fire and succeeded in protecting many residential homes and most of the ancient buildings. Forty buildings were burnt down, including 17 residential homes, three in the cultural heritage area. Six hundred and eighty-one persons were evacuated during the fire. Fortunately, no-one was seriously injured during the blaze.

SP Fire Research is engaged by the Norwegian Directorate for Civil Protection (DSB) to assess how and why the fire spread in Lærdal. We are looking at possible mechanisms of fire spread in large fires like this, and how details in building constructions and their surroundings affect fire spread. The effects of different efforts during the firefighting is also being evaluated. The aim of our work is to learn from this incident and extend knowledge about large fires, I order to prevent this happening again. The information is obtained by analyzing an enormous number of photos

Fire brigades and volunteers made a tremendous effort when fighting the fire in Lærdal January 2014. Strong wind and a heavy shower of sparks and flying brands made the task difficult. Photo: Morten Sortland, Sogn Avis, Norway.

Cultural heritage wooden houses in Lærdal that were not damaged by the fire. Photo: SP Fire Research AS.

The house to the left was a protected wooden building from the 1840's, and was completely destroyed in the fire. The firefighters managed to save the protected house to the right from the flames. Photo: SP Fire Research AS.

and videos from the event, through interviews, articles in newspapers and scientific journals. The report will be published in June 2014.

During our work we clearly see the need for more research on many topics connected to large fires, both to understanding the fire phenomenon and to investigating the efficiency of technical and organisational fire protective measures. We sincerely hope that fire research will be on the agenda in future research programs and that fire safety is explicitly mentioned in both national and international research calls. There are many fire safety challenges – both in Norway and in the rest of Europe - that we would be able to solve in collaboration with our colleagues in the international fire safety community.

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