



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



A N N U A L  
R E P O R T

2014



EGOLF members, Efectis Nederland, March 2014

# Financial Report

	<b>2014</b>
	€
<b>INCOME</b>	
Membership subscriptions	121,200
Courses	34,000
Other income	2,226
<b>Total income</b>	<b>157,426</b>
<b>EXPENDITURE (inc. VAT)</b>	
Secretary General	75,527
Executive expenses	6,952
Plenary & TC meeting costs	2,868
GNB FSG Secretariat	9,239
Round robins, courses & workshops	24,215
Website hosting & developments	3,990
Printing costs	3,518
Annual audit	2,160
Other expenses	2,780
<b>Total expenditure</b>	<b>131,249</b>

## A view from the President



Dear Members, Partners and Stakeholders

This is my last editorial as President of EGOLF and I should like to congratulate our new President elect, Anne Steen Hansen from SP Fire Research A.S., Norway, who will take up office in the Spring 2016.

In the past year, we have welcomed into membership Cambridge Fire Research Ltd., MPA Dresden GmbH and RED Hong Kong. EGOLF annual meetings were hosted by Efectis Nederland and RIFS in Belarus.

I should like to thank all the committed members who contribute actively to our work, including the development and delivery of training courses, workshops and round robins and the valuable experience and expertise they bring to our Technical Committees. Thanks to them, EGOLF is able to offer an impressive level of engagement and quality of service to its members, exceeding any other Association of its kind outside Europe.

Over the last five years, I have tried to direct EGOLF in a manner which not only serves our members' technical needs and aspirations for quality but also their businesses. Being an EGOLF member has become a must in Europe and, to a lesser extent, outside Europe. Reference to business when safety of life is at stake may at first seem to be a dirty word, but given the economic changes, especially in the funding of our organizations, doing business effectively is the only sustainable way to be able to ensure our views are put forward, for the benefit of all.

EGOLF is facing a world in which the development or revision of standards is too often considered by industry as a means to gain advantage for a given range of products. The economic interests of industry can be very strong indeed and it is therefore hard sometimes to maintain our position in defence of fire safety in the face of some very powerful lobbying. Thus, EGOLF decided to strengthen its actions as a group and to intensify its "pre-standardization" work in support of CEN.

Nevertheless, there are a number of standards being issued, in particular Extended Application standards, of which some have been revealed not to be applicable or safe. The willingness of CEN, as part of its aim to facilitate the circulation of products, was to establish rules for extended application based on experience, know-how and expertise. This exercise has demonstrated that the task is extremely difficult. In their present format, it would be more reasonable to consider EXAPs as guidance, and not rules. The laboratory issuing the extended application would then be fully responsible for endorsing the EXAP guidance and therefore able to provide justification for its application.

My final point is a message about market surveillance. Where problems or complaints are raised by product manufacturers or fire testing laboratories for the attention of a National Market Surveillance Authority in respect of claims made about the properties or performance of a product (e.g. in a fire test report), EGOLF has the competence to offer assistance to that Authority by carrying out an assessment of the technical documentation concerned.

I wish all of you a nice and safe year.

A handwritten signature in blue ink, appearing to read 'Pascal COGET'. The signature is stylized with a long horizontal stroke at the end.

Pascal COGET  
EGOLF President

# EGOLF meetings 2014

Author: Christine Roszykiewicz (EGOLF Secretary General)

## PLENARY MEETINGS

The biannual meetings of EGOLF in 2014 were hosted by Efectis NL in Delft and RIFS in Minsk, Belarus. These events gave Members an opportunity to review annual activities and to anticipate needs for future round robins, harmonisation courses, and workshops. Round robins completed in 2014 included a test to EN ISO 9239-1 which is featured in this Newsletter, together with a steel beam test to EN 1365:2012 and EN 1365-3:1999, which will be reported in 2015.

Other activities focused on two workshops, one on EXAPs for glazed constructions to EN 15254-4:2008 +A1:2011 and another on EN 1365-1:2012 – fire resistance tests for loadbearing elements – walls, which are also featured in this Newsletter. The round robin tests and workshops

were complemented by a total of fifteen harmonisation courses which covered the full series of reaction to fire tests, as well as those fire resistance tests most commonly performed by our Members.

As part of the Association's five year Strategy Plan, Members discussed the pooling of resources in order to submit future collective applications for European research funding. Several project ideas are being considered, including the development of e-training for a specific and limited number of harmonisation courses. As well as reducing the costs of travel, this would allow Members whose staff are not proficient in English to offer harmonisation courses in their native language. EGOLF is willing to consider applications too from

external organisations which would benefit from our combined expertise. By way of a complement to technical matters, the biannual meetings of EGOLF allow Members at least one evening of the week to relax and enjoy new experiences in different cultures. During the March 2014 week of meetings in Delft, Members enjoyed a dinner and visit to Madurodam, a miniature city of 1:25 scale model replicas of famous Dutch landmarks, historical cities and developments, courtesy of Efectis NL and their sponsors, the furnace manufacturer Systemtechnik.

In October, Members were treated to a surprise visit to the fire testing and research facilities of the Ministry for Emergency Situations of the Republic of Belarus (RIFS). Here they witnessed emergency recovery operations on railway transport and oil storage facilities, as well as emergency training exercises for airline cabin crews, including climbing on board a smoke filled aeroplane to witness at first hand the use of rescue equipment and procedures during an aviation accident. By way of a foray into the historical and cultural heritage of Belarus, the evening commenced with a visit to the bank of the Berezina River and the famous Brilevskaya Field, where the Russian army defeated Napoleon in 1812.



Meeting of EGOLF, October 2014 at RIFS, Belarus



EGOLF participants at the course on EN 13381-4 and -8, ITB Fire Research Laboratory in Pionki City, Poland

Plenary meetings are also an opportunity to welcome formally those labs. which have been accepted into membership during the current year. In 2014, EGOLF was delighted to welcome into full membership Cambridge Fire Research (CFR), UK, and MPA Dresden, Germany. In October 2014, the President of EGOLF, Pascal Coget, undertook a visit to RED in Hong Kong, who were subsequently elected into membership in March 2015. All three new Members are featured in this Report.



Anne Steen-Hansen  
EGOLF Executive Committee member in Minsk



Sculpture fire fighters



Fire in a fuel tank



Extinguishing fire in train



Smashing aircraft emergency window



Smoke-filled aircraft

## CEN-CENELEC Liaison Organisation

In 2014, EGOLF was invited by CEN-CENELEC to become a partner with the status of Liaison Organisation. This should enable the Association to contribute more effectively and directly to the work of relevant CEN

Technical Committees, by providing added-value expertise and formal guidance through the direct participation of our representatives. It allows the Chairmen of EGOLF TC1 (Reaction to Fire) and TC2

(Fire Resistance) to bring to the attention of CEN TC 127 new EGOLF Recommendations and Position Papers, which are taken into account during future revisions to the standards.

## Honorary Member Award

At the meeting in Minsk, Members were unanimous in their support of this new award which was created in 2014. It is meant as a lifetime honour and for the first time the award has been offered to founder member and first President of EGOLF, Mr Paul Vandevelde of Warringtonfiregent, in recognition of all the experience

and wisdom and many ways in which he has supported and continues to support the Association. Although not strictly speaking a 2014 event, this is a photo of Paul and his lovely wife Rosa, who joined him to receive the Award at the EGOLF meeting in March 2015.



Paul and Rosa Vandevelde

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## TECHNICAL COMMITTEE MEETINGS

### TC1 (Reaction to fire)

In March 2014, a special welcome was extended to Rupert Ehrlenspiel (TUM HFM, Germany), for whom this was his first meeting as chair of TC1. The biggest single topic currently

facing this Committee concerns the test methods for external fire exposure to roofs, CEN/TS 1187:2012. The round robin to this test method, which was completed in 2013,

generated more helpdesk items and discussions in 2014 than the SBI test method EN 13823:2010+A1:2014.

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### Round Robins

In the framework of TC1 activities in 2014, a round robin test was completed to EN 9239-1. This was organised by Warringtonfiregent, Belgium, in collaboration with SP Fire Research AS, Norway. Draft results were presented in the Autumn and final results are featured in this Newsletter, based on the public summary report which is available on the Publications folder of the EGOLF website ([www.egolf.org.uk](http://www.egolf.org.uk)).

<b>TC1 – Reaction to Fire EGOLF Recommendations (EGRs) and Position Papers (EGPs) published in 2014/2015</b>	
These are publicly available and can be downloaded at: <a href="http://www.egolf.org.uk/documents/egolf-recommendations.html">www.egolf.org.uk/documents/egolf-recommendations.html</a>	
EGR 81	Classification report according to EN 13501-5, based on testing according to CEN/TS 1187, test method 1
EGR 82	Flaming droplets and particles - harmonised grid for SBI burner
EGR 86	PIR and PUR flat and linear products classification
EGR 88	Test specimen CEN/TS 1187 tm1
EGP 02	TS 1187 direct field application rules

## TC2 (Fire resistance)

### Round Robins

One of the main activities during 2014 was a round robin on EN 1365-3: fire resistance test of loaded beams. An uninsulated steel beam was tested by 16 member laboratories; some chose to carry out tests on two different lengths of beam. A public summary report is available on the Publications areas of the EGOLF website ([www.egolf.org.uk](http://www.egolf.org.uk)). During 2014, six EGOLF recommendations were generated and brought to the attention of the relevant CEN TC 127 working groups.

#### TC2 – Fire Resistance

##### EGOLF Recommendations (EGRs) published in 2014/2015

These are publicly available and can be downloaded at:  
[www.egolf.org.uk/documents/egolf-recommendations.html](http://www.egolf.org.uk/documents/egolf-recommendations.html)

EGR 83	Different test results on the same product - fire resistance
EGR 84	EN 1363-1 & EN 1364-1 Discontinuity – different interpretations
EGR 85	EN 1365-1 Verification of wood studs in loadbearing samples
EGR 87	EN 1364-1 of unexposed face thermocouples on the frame
EGR 89	ETAG 018-3 Evaluation primers
EGR 90	EN 1364-3 Gaskets

## TC4 (Accreditation, Certification and Inspection)

During 2014, TC4 continued to focus on EGOLF's standing as a quality label, with the launch of the Association's "Minimum Membership Requirements" which the Committee will be monitoring closely. The target is to ensure that all Members

- attend EGOLF harmonisation

- courses for the tests they perform
- participate in all round robin tests for which they are accredited
- take part regularly in Plenary and relevant Technical Committee meetings
- undertake at least one task in the interest of other members every five years; tasks range from organisation of a round

robin or development of a new harmonisation course to supplying expert advice on the EGOLF Helpdesk Forum

## New EGOLF logo

In 2014, Members agreed it was time to update the EGOLF logo; the winning design, supplied by Captains of Printing N.V. in Belgium, graces the cover of this year's Annual Report.



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## New EGOLF Appointments



**Internal Auditor** – Jacques Mertens, Peutz (Netherlands) was appointed in March 2015 to serve a term of three years.

## EGOLF re-appointments



**Executive Committee (Conseil de Gérance)** – Anne Steen-Hansen, SP A.S. (Norway) was re-appointed in March 2015 to serve a further term of three years.

## EGOLF Workshops and Harmonisation Courses – 2015/2016

Test Method	Standard	Location and date	Course fee	Registration contact
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### COURSES

Penetration and linear seals	EN 1366-3, EN 15882-3 and 1366-4	<b>22nd &amp; 23rd September 2015</b> SP Fire Research, Borås (Sweden)	Members €1050 Non-members €1350	Linnéa Hemmarö linnea.hemmaro@sp.se
Test methods for determining contribution to fire resistance of steel and concrete structural members – passive and reactive protection products applied to steel members	EN 13381-4 and EN 13381-8 + assessment methods	<b>16th to 18th November 2015</b> ITB, Warsaw (Poland)	Members €1150 Non-members €1450  <i>(NB The fee for Members who attended this EGOLF course in 2014 and require Assessment Methods only is €600)</i>	Marek Łukomski m.lukomski@itb.pl Fax: +48 22 847 23 11 or Beata Thiel b.thiel@itb.pl
Fire resistance tests for loadbearing elements. Part 1 - Walls and Part 2 – Floors and roofs	EN 1365-1 & EN 1365-2	<b>17th &amp; 20th November 2015</b> ITB, Warsaw (Poland)	Members €950 Non-members €1250	Marek Łukomski m.lukomski@itb.pl Fax: +48 22 847 23 11 or Beata Thiel b.thiel@itb.pl
Test methods for determining contribution to fire resistance of steel and concrete structural members – passive and reactive protection products applied to steel members	EN 13381-4 and EN 13381-8 + assessment methods	<b>16th to 18th May 2016</b> ITB, Warsaw (Poland) or Pionki (Poland) to be decided	Members €1150 Non-members €1750  <i>(NB The fee for Members who attended this EGOLF course in 2014 and require Assessment Methods only is €600)</i>	Marek Łukomski m.lukomski@itb.pl Fax: +48 22 847 23 11 or Beata Thiel b.thiel@itb.pl
Test methods for determining contribution to fire resistance of steel and concrete structural members – applied protection to concrete members	EN 13381-3	<b>19th to 20th May 2016</b> ITB, Warsaw (Poland) or Pionki (Poland) to be decided	Members €950 Non-members €1550	Marek Łukomski m.lukomski@itb.pl Fax: +48 22 847 23 11 or Beata Thiel b.thiel@itb.pl

### WORKSHOPS

Facades	-	<b>October 2015</b> <i>Date to be confirmed</i> ÉMI, Budapest (Hungary)	Free (available to Members only)	István Móder imoder@emi.hu
EXAP and classification of glazed partitions	EN 13501-2 & EN 15254-4	<b>November 2015</b> <i>Date and location to be confirmed</i>	Free (available to Members only)	<i>To be confirmed</i>
Smoke dampers	EN 1366-10	<b>November 2015</b> <i>Date and location to be confirmed</i>	Free (available to Members only)	<i>To be confirmed</i>



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# EGOLF Workshop: Loadbearing walls

Author: Nathalie Briand, Project Leader, Fire Testing Centre – CERIB

**CERIB is the Research and Development Centre for the French precast concrete industry. With more than 45 years' experience, it is the only technical centre in Europe devoted to this sector of industry. It helps to achieve greater technical progress, enhanced performance, and improved quality of precast concrete products.**

Part of CERIB, the Fire Testing Centre Promethee, is one of three French fire resistance laboratories accredited by the French Ministry of the Interior. It performs standard tests and tests specifically designed to meet customer requirements, such as for research purposes.

In this context, the Fire Testing Centre offered to host a workshop on the harmonisation of EN 1365-1: 2012 Fire resistance tests for loadbearing elements – Part 1: Walls.

The preparation of the workshop was undertaken with the participation of Lars Boström of SP Technical Research Institute of Sweden, who is also the Chair of EGOLF TC2 for Fire Resistance.

The workshop was held on 14th and 15th January 2014, and 10 laboratories took part in the event (DBI, Denmark; Université de Liège, Belgium; MPA Braunschweig, Germany; SP Technical Research Institute, Sweden; SP Fire Research A.S., Norway; CSTB, France; Warringtonfire Gent, Belgium; ITB, Poland; SII, Israel; and BM Trada, UK).

The aims were:

- to compare practices & knowledge in order to develop a harmonized approach for performing a test according to EN 1365-1 & EN 1363-1;
- to discuss technical problems and physical interpretations;
- to provide relevant, best

practice solutions through EGOLF recommendations.

Prior to the workshop, CERIB sent all the participants a presentation of the main topics to be discussed during the workshop. The document was designed to provide the basis and structure of the workshop.

For a more practical approach, CERIB proposed to perform a fire resistance test. The test specimen was a masonry wall 3 m height / 4 m width, made of concrete blocks (500 x 200 x 200 mm<sup>3</sup>, compression grade: B40, fixing: horizontal & vertical joints with Portland cement mortar) and loaded with 133 kN / linear meter.

After the welcome and introduction to the workshop, the delegates visited the Fire Testing Centre Promethee. They had the opportunity to ask questions about the fire testing conditions, in particular:

- The spreader beam rotation measurement;
- The loading system used;
- The differential operating pressure

Participants were in the monitoring room at the beginning of the test and had the opportunity to observe the thermal and loading monitoring systems used before moving to the meeting room to discuss the test and continue the workshop.

The workshop raised a large number of questions, for example:

- Test wood construction and the variability of wood resistance;
- Testing elements larger than the furnace width;
- Test specimen conditioning;
- Boundary conditions and fire exposure along the edges;
- Loading conditions (axially/ eccentric loading, fixed/hinged edge) ;
- Loading and displacement measurement;
- Test report content.





After discussions concerning interpretation issues and common practice shared by laboratories, several delegates were selected to prepare new EGOLF recommendations.

In addition, it was decided to submit two topics to CEN for implementation

in the standard EN 1365-1 during next revision. These concern:

- The spreader beam rotation measurement and its possible impact on DIAP;
- The increase in DIAP.

The workshop contributed to the development of a harmonised

approach for the testing of loadbearing walls. And thanks to the efforts of the EGOLF delegates, it was possible to share best practice and a common vision with all the Membership.

## New members

### Cambridge Fire Research Limited, United Kingdom

*Author: Emma Wilson, Cambridge Fire Research, UK*

Cambridge Fire Research (CFR) is a private business and was first established as a separate independent legal entity in 2005 followed shortly after by a new purpose built laboratory, fitted out with new furnaces. For many years before this the research and

development department of Dixon International (an intumescent manufacturer) had a small indicative furnace on the same site and some of their staff transferred to CFR. Our laboratory is based in Pampisford, just south of Cambridge with convenient links to London airports and the UK road network.



Full Scale Furnace 10x8

CFR specialise in fire resistance testing of construction products and are accredited as a testing laboratory (No. 4319) against ISO/IEC 17025 by UKAS (United Kingdom Accreditation Service) for European (EN), British (BS), International (ISO) and American (UL, NFPA and ASTM) standard tests. Our scope includes building products such as doors, walls, glazed screens, service penetration seals and linear gaps. We also conduct ad-hoc and indicative tests for the purposes of product development by our clients. As a Notified Body Testing laboratory (NB 2337) with horizontal notification under CPR our tests can be used for the purposes of CE marking. CFR is also an approved testing laboratory recognised by United Arab Emirates



Brian Richardson



Emma Northrop



Eric Southern



Stuart Plummer



Tim Smith

Civil Defence and recognised by VKF and FBT in Switzerland. CFR has also conducted tests under UL sub-contract, which have been used for UL certification.

Our purpose built laboratory has two furnaces and an area for assembly of specimens with overhead gantry crane. Of the two furnaces, one is a non-loadbearing wall furnace of 3m x 3m and the other is a reduced size with options to test smaller vertical or horizontal elements. We also have the equipment required to apply a high pressure hose stream to the exposed face of the specimen shortly after the end of a fire resistance test, as required by American test standards.

Clients are welcome to view tests and examine their specimen both during and after the test, subject to consideration of health and safety issues of their specific test specimen. We have a well-positioned client viewing room within the laboratory, with a positive pressure air feed, to offer a comfortable viewing experience.

Additionally, we can also install and construct test specimens to our client's requirements and have some carpentry facilities and experience on site.

Our objective is to meet the needs of manufacturers and provide quality testing, while maintaining the

highest levels of confidentiality and operating with underlying values of impartiality, fairness, honesty and integrity.

CFR has a dedicated team of well qualified, knowledgeable and experienced technicians and engineers which includes Mechanical Engineers and Scientists, of which two staff have over 26 years of experience in fire resistance testing each.

## MPA Dresden GmbH - International Centre of Excellence for Fire Protection

Author: Dipl.-Ing. Thomas Hübler, Managing Director

In 1991, MPA was established in Dresden with a branch office in Freiberg. The tradition of fire research and testing, which was begun in Freiberg in 1928, was continued. MPA Dresden GmbH was privatised in 2004, and has developed into an accredited test, monitoring and certification body for active and

passive fire protection. Additionally, there is an MPA engineering office for project-related appraisals.

We offer state-of-the-art fire resistant testing technology with a fire testing room video, as well as the complete range of tests that demonstrate fire behaviour. The multifunctional test station is also equipped with escape chutes. A test station that determines the fire behaviour of photovoltaic installations as per UL790 is also available.

We have been internationally orientated for a long time. We were first accredited as a test laboratory as per DIN EN 17025 in the early 1990s. Since then we have regularly expanded our scope to meet the needs of our customers. At a later date, we received accreditation as an inspection and certification body, which led to international





recognition of our results and documents. European notification to the Building Product Act was a logical step forward.

Increased harmonisation in Europe, especially in construction, therefore only poses a contingent challenge. In other areas, such as rail car engineering and in the cable industry, international acceptance of the test body has been an essential prerequisite for our successful work for a long time now. This made it possible for MPA Dresden GmbH to be accredited by VKF in Switzerland for building products, IMO in London for tests according to the FTP Code for maritime navigation, and by UAE/DCD for a variety of fire protection products.

We offer a multitude of additional tests, for example on cables, products for the rail vehicle construction and ship building industry, safety and IT cabinets and furniture. Real scale fire tests are also regularly conducted. Added

to this is the singular combination of active and passive fire protection. MPA Dresden GmbH is the only test body in Germany where tests on fire extinguishers and extinguishing agents, fire extinguishing sprays and fire blankets, as well as on compact extinguishing systems are conducted.

This range of services is being continuously expanded in response to customer needs. There is currently a facade test facility in the pipeline, which will cover all the notable European test scenarios. Special tests are significantly increasing significantly as well. Due to the absence of a suitable standard for special tests, a test scenario is developed together with the manufacturer, with which a reasonable attestation can be administered, thus opening up additional free testing grounds. Furthermore, other project-related services, such as appraisals, fire protection certificates, etc., are also offered.

It is MPA Dresden GmbH's goal to become an internationally-operating service provider in the field of fire protection, and we've already come a long way.

Customer satisfaction is very important to us. It is our objective to provide exceptional quality for the tests and certifications commissioned, and to deliver these within as short a period of time as possible, thanks to the outstanding professional expertise of our employees as well as through our modern technical equipment. The highest priority, however, is given to the rules of neutrality and the retention of absolute independence.

## RED, EGOLF's first associate member from Hong Kong, China

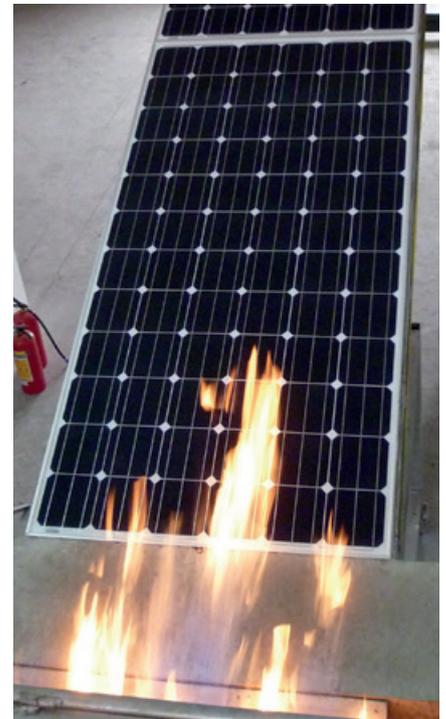
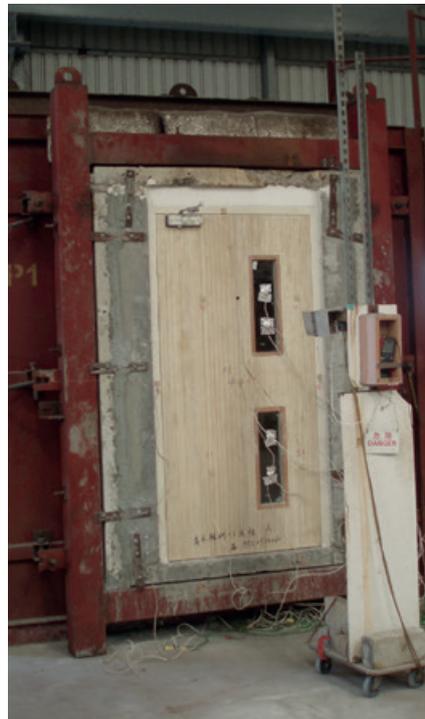
Author: James Lee,  
Research Engineering Development  
Façade Consultants Ltd.



Research Engineering Development Façade Consultants Limited (RED) is delighted to be the first fire resistance testing laboratory in China and Hong Kong to join the membership of EGOLF. Since there are not many national fire groups or parties in the Far East Asia concerned with the development of harmonized test methods or standardization of testing quality, we believe that EGOLF can be a platform for laboratories in the region to improve their quality of services and to promote research and development of fire testing activities. RED are therefore proud to join as a member. Hopefully, more laboratories in the region will become part of the Association in future and will be able to participate in the harmonization of testing.

Research Engineering Development Façade Consultants Limited (RED) was established in 1996 and the first laboratory in Hong Kong to provide independent quality and assurance testing services for the curtain wall systems of large buildings, the testing of fire containment systems in buildings, as well as fire resistant materials.

Our testing laboratories in Hong Kong and China hold accreditations to ISO/IEC 17025 for curtain wall and fire testing from HOKLAS, operated by the Hong Kong Accreditation Service (HKAS) from The Government of the Hong Kong Special Administrative Region.



# EGOLF round robins – a key benefit of membership for fire testing laboratories

Author: Andrzej Borowy, Instytut Techniki Budowlanej (ITB) - Fire Research Department

EGOLF organizes and contributes financially to both reaction to fire and fire resistance round robin tests. To organize and perform round robins is one of the most important activities undertaken by EGOLF. Why is it so important? The results of round robins provide the greatest benefits to its membership, the fire testing laboratories, because they:

- provide an estimate of the repeatability and reproducibility of a test method
- identify difficult aspects of the testing procedure for individual laboratories
- determine how well laboratories are able to calibrate their equipment (where relevant)
- show the weak points of a test method (and sometimes also a classification procedure)
- are a tool whereby laboratories can be assured of their technical competence
- may be used to provide accreditation bodies with evidence of a laboratory's performance
- enable laboratories to improve their procedures and/or

equipment to harmonise test results

- can be used in discussion with customers:
  - as an argument to support the classification given (in particular when the test result is close to the criterion limiting value)
  - as supporting evidence to confirm a laboratory's technical competence
- serve as a platform for the permanent exchange of different testing experiences

In the reports of round robins, all test results are presented anonymously. However, each laboratory is able to compare its own results to the anonymous test results of other participants. It is a principle that any aspect of the test results shall not be identified to another laboratory. A brief glance at the number of participants in EGOLF round robins reveals that, in all of these exercises, the number of test results delivered was sufficient to perform a statistical analysis. In the table below, the numbers of participants in EGOLF round robins are listed.

The round robin results indicate that fire test methods in many cases are not sufficiently repeatable and reproducible, and sometimes even lead to different classifications. It is difficult as there is a huge variety of building products in terms of material, composition and construction, and at the present time even traditional building products are being constantly modified. Hence the substantial influence of the test sample on fire test results is observed.

We have to remember that, according to EN ISO/IEC 17025:2005, section 5.9:

*"The laboratory shall have quality control procedures for monitoring the validity of tests and calibrations undertaken. The resulting data shall be recorded in such a way that trends are detectable and, where practicable, statistical techniques shall be applied to the reviewing of the results. This monitoring shall be planned and reviewed and may include, but not be limited to, the following:*

*...b) participation in inter-laboratory comparison or proficiency-testing programmes; ...."*

This means that round robins can serve as a tool which allows labs. to demonstrate to their national accreditation bodies that they are able to obtain results within a suitable tolerance or reproducibility limit and that they fulfill the requirements of EN ISO/IEC 17025:2005. In parallel, round robins provide other benefits which are outlined above.

As a third party organization which brings together most of the fire testing laboratories in Europe (the majority are notified bodies), EGOLF is best placed to continue organizing and performing round robins in the field of fire testing and to providing a forum for discussion and development in the interest of all of its members.

Test method	Year	Number of participating labs
EN 13823	2003-2004	30 (20 EGOLF + 10 manufacturers)
EN ISO 1182	2006-2007	28
EN 1364-1	2009	32
EN ISO 1716	2008-2009	35
EN ISO 1182	2010-2011	28
EN ISO 11925-2	2010-2011	40
CEN/TS 1187 tm1	2013	16
CEN/TS 1187 tm2	2013	10
Classification/field of application of a wall test	2012-2013	27
EN ISO 9239-1	2013-2014	23
EN 1365-1 & 3	2014-2015	14
Forthcoming round robins		
EN 50399 (on behalf of FSG of GNB-CPR)	2015-2017	30
EN 13823	2015-2017	30

# EGOLF Round Robin on EN ISO 9239-1 Reaction to fire tests for floorings

## PART 1: DETERMINATION OF THE BURNING BEHAVIOUR USING A RADIANT HEAT SOURCE

Authors: Anne Steen-Hansen, SP Fire Research AS, Norway and Bart Sette, Warringtonfiregent, Belgium

### Introduction

EN ISO 9239-1 – Reaction to fire tests for floorings – Part 1: Determination of the burning behaviour using a radiant heat source is the central fire test for floorings in Europe, and is used to document products in classes A2fl, Bfl, Cfl and Dfl in the system of Euroclasses according to the classification standard EN 13501-1.

The apparatus is shown in Figure 1.

EGOLF performed a round robin exercise on EN ISO 9239-1 during 2013 and 2014. The tests were performed during the Autumn and Winter 2013-2014, and the final public summary report was published on EGOLF's website in November 2014.

### Organization and participation

The round robin was organized by Bart Sette, Warringtonfiregent,

Belgium, and Anne Steen-Hansen, SP Fire Research AS, Norway. Warringtonfiregent organized the distribution of test specimens and test instructions, while SP Fire Research analysed the test results. In addition, SP fire Research in Sweden prepared and distributed specially designed calibration boards to be used in the round robin exercise. 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.

In total 23 laboratories took part in the round robin exercise.

### Purpose of the round robin

The aims of this round robin exercise were:

- to confirm that EGOLF laboratories are able to perform testing according to EN ISO 9239-1 in a proper way
- to provide information about the reproducibility and repeatability for EN ISO 9239-1
- to give an indication for each participating laboratory regarding its performance when performing tests according to EN ISO 9239-1
- to provide an indication of the variability in equipment, procedures and tools

### Tested material

The tested material consisted of untreated particle board with nominal thickness 22 mm and nominal density 650 kg/m<sup>3</sup>. Three specimens of the material were tested in each laboratory. According to Commission Decision of 15 May 2007, this product can be classified as Dfl-s1 without testing.

### Test procedure

The tests in the round robin were performed according to the procedure described in EN ISO 9239-1, the Flooring Radiant Panel test.



Figure 1: Test apparatus according to EN ISO 9239-1. The photo is taken by one of the participants.

Information on this and how the results should be reported was sent to the participants before testing commenced.

Some definitions from EN ISO 9239-1:

**Critical heat flux at extinguishment, CHF:**

incident heat flux, in  $\text{kW/m}^2$ , at the surface of a specimen at the point where the flame ceases to advance and may subsequently go out.

**Heat flux at X min, HF-X:**

heat flux, in  $\text{kW/m}^2$ , received by the specimen at the most distant spread of flame position observed during the first X min of the test

**Critical heat flux:**

heat flux at which the flames extinguishes (CHF) or the heat flux after the test period of 30 min (HF-30), whichever is the lower value (i.e. the flux corresponding to the furthest extent of spread of flame within 30 min)

Prior to testing the round robin samples, each participating laboratory ran a calibration according to the procedure described in EN ISO 9239-1, clause 8.1. Calibrations included:

- air flow rate;
- chamber temperature;
- burner black body temperature;
- Heat flux levels on nine locations at the height of the specimen.

In addition, laboratories had the opportunity to participate in an optional calibration exercise making use of an experimental calibration board developed for use in this round robin exercise. Four different calibration boards were prepared, and named after the Swedish royal family. One of the calibration boards is shown in Figure 2.

**Test results**

Typical test specimens before and after the test are shown in Figure 3.

The following test results were reported:

- The time at which the flames reach each 50 mm mark (s)
- final maximum flame-spread distance (mm)
- flame-spread distance after 10 min (mm)
- flame-spread distance after 20 min (mm)
- flame-spread distance after 30 min (mm)
- time of flame extinguishment (min:s)
- duration of the test (s)
- critical heat flux ( $\text{kW/m}^2$ )
- smoke development ( $\% \cdot \text{min}$ )

Before testing of the particle boards took place, all laboratories performed a calibration of their apparatus according to clause 8.1 in EN ISO 9239-1. The results from these tests showed that all laboratories



Figure 2: Calibration board used in the round robin exercise. The front side is shown in the left photo, and the rear side with the mounted thermoelements is shown in the right photo. Photos: SP Fire Research, Borås.

fulfilled the criteria given in Table 1 in the standard.

The test results were analysed according to ISO 5725-2. Accuracy (trueness and precision) of measurement methods and results – Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method. The data was analysed for consistency and outliers, using both graphical and numerical techniques. The general mean values, the repeatability standard deviation  $s_r$  and the reproducibility standard deviation  $s_R$  were calculated for each of the measured variables after removal of outliers among the data.

### 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 participants perform

testing according to EN ISO 9239-1 with results within acceptable limits of repeatability and reproducibility. The repeatability and reproducibility for the test results on critical heat flux are at the same level as the values for particle board from an earlier round robin exercise reported in the standard EN ISO 9239-1:2010, and should be considered as good.

The repeatability for smoke production is not very high, but may be regarded as acceptable. Smoke production is in general a property with relatively low repeatability compared to other types of measurements. The reproducibility of the smoke production results is, however, rather poor. The reason for the large spread in test results should be investigated further.

The results from the tests with the calibration boards show that the variation between the laboratories regarding the distribution of heat flux on the specimen is acceptable.

The Public Summary Report of the EGOLF EN ISO 9239-1 Round Robin 2013-2014 can be downloaded from EGOLF's website: <http://www.egolf.org.uk/documents/round-robin.html>



Figure 3: Typical test specimens of untreated particle board before (left) and after (right) test. The photos were taken by one of the round robin participants.

# Summary report of Workshop on EN 15254-4 Glazed Constructions

Author: Stefan van de Wetering, Project Leader SP Fire Research, Sweden

## Introduction

In 2013 an EGOLF round robin was carried out on the fire resistance classification and appropriate field of application of a glazed partition. The results from that round robin showed that the standards, and more specifically the EXAP standard



EN 15254-4, were interpreted differently by different users.

A typical example of a glazed partition being exposed to fire conditions is shown in the following pictures. The exposure time is respectively 0 min, 3 min and 90 min.

## Organisation and participation

The workshop was organized by Lars Boström and Stefan van de Wetering, SP Fire Research, Sweden and was held at the SP's Laboratory in Borås, Sweden on 26th and 27th of November 2014. A total of 13 representatives from 12 EGOLF member laboratories participated in the workshop.

## Purpose and workshop

The purpose of the workshop was to give participants an opportunity to discuss interpretations and foresee problems within primarily the EXAP standard EN 15254-4, in order to attempt to harmonise the approach using the EXAP across Europe, but also the test standard EN 1364-1 and the classification standard EN 13501-2.

## Conclusions from the workshop

Some conclusions from the workshop are described below. A full report is available to members on the EGOLF website as document number N752.

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*'Correct' classification of the tested specimen*

Participants had different views initially of what the 'correct answers' should be. After some discussion it was agreed that classification 'E130 + EW30 + E30' (3 highest classes) was the correct one. If required by the lab., it is possible to add a sentence 'lower classes are also possible' without specifically mentioning the classes.



*Combination of applications from the EXAP standard*

It was not clear to all participants what is possible with these rules e.g. how many changes can be allowed per additional test? Clarification is therefore being sought from CEN.

*Exchange of fire resistant glass type*

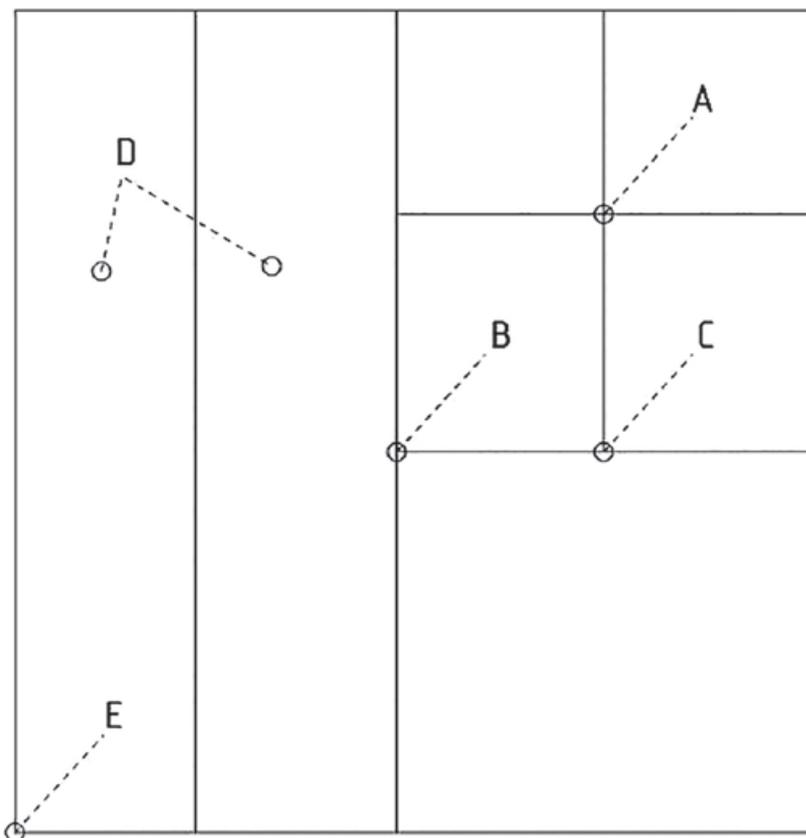
A clear and unambiguous (non-commercial) definition of 'glass product group' is required to be able to implement the rules in Chapter 6.1 of the EXAP standard. It was agreed that EGOLF would draft a proposal for a general glass setup with detailed information which is considered important for fire resistance.

*Increasing glass thickness and maintaining the structural stability of the element*

It was unclear to participants what kind of information is needed to fulfil this requirement. Clarification is being sought from CEN about acceptable calculation methods. All participants agreed that calculations should be performed in both cold and hot conditions.

*Exchange of frame junction type*

The EXAP standard defines the relevant junction types, shown in the following drawing:



Participants agreed that all junction types shall be tested ("What You Test Is What You Get"), and that the position of the junction is also important and should therefore be tested separately, as shown in the following drawing:

#### *Replication of a glazed element with reference to radiation*

Replication of fire resistant glazed element with reference to radiation should be allowed if EI is also allowed. This issue will probably be solved in the revision of EN 1364-1.

Further discussion revealed that replication of glazed elements is not the same as extension of width of the glazed element. Replication will always result in two separate elements, bonded together, where an extension of width can still be one element.

#### *Compliance with the appropriate design code (requirement from EN 1364-1)*

Is this issue the responsibility of the test institute or the test sponsor? Most participants agreed that it is the responsibility of the test sponsor. Laboratories are willing to perform these calculations as long as the methods for calculation are clearly specified by CEN. This is similar to radiation calculations as given in EN 15254-4.

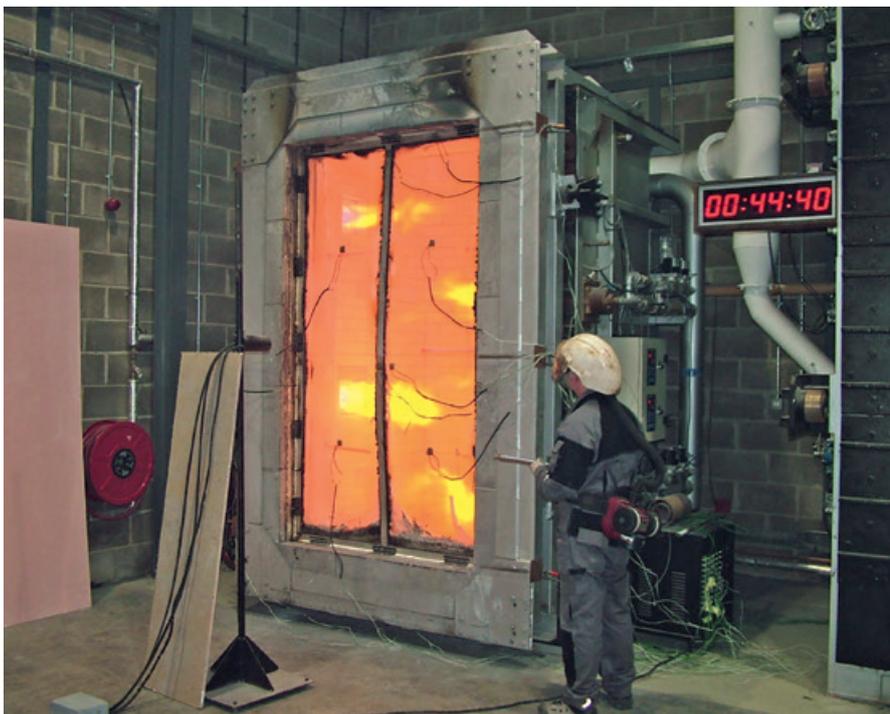
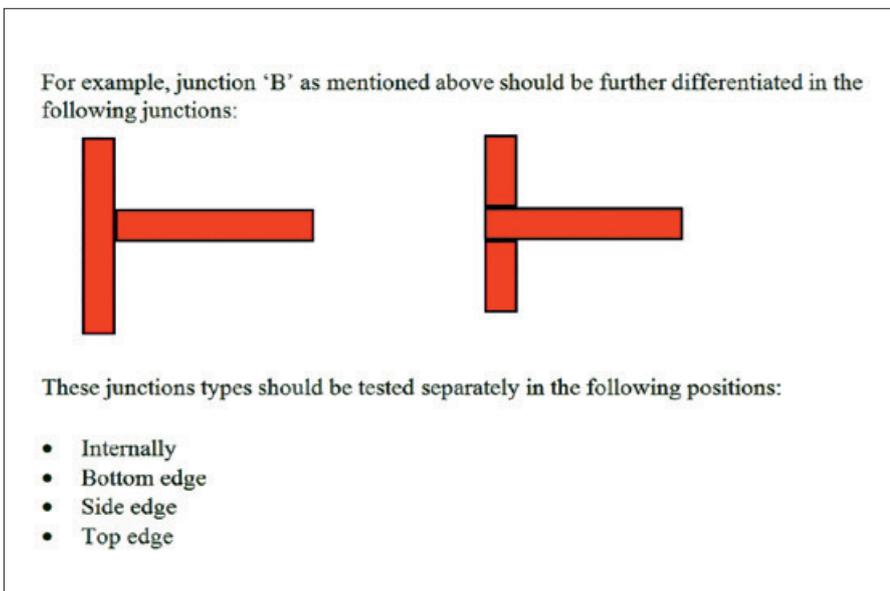
#### *Copy-paste versus interpretation*

Should a classification report be as readable as possible for any user, or should it simply list applications in the form of the original text from the standards?

Participants agreed that the laboratory should supply the interpretations and not copy and paste from the standards.

#### **Outcome of workshop**

Workshop discussions resulted in a number of actions. Some issues are currently being dealt with internally in the form of EGOLF Recommendations. The remaining ones have been brought to the attention of CEN TC 127 in EGOLF's Liaison Report.



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