

Fire Retardant Technologies 2014 (FRT14)

University of Central Lancashire, Preston, UK
14 – 17 April 2014



Confirmed Speakers

Jenny Alongi

Serge Bourbigot

Ulrike Braun

Giovanni Camino

John R Ebdon

Sabyasachi Gaan

Yuan Hu

Richard Hull

Baljinder Kandola

Paul Kiekens

Martin Klatt

Sergei Levchik

John Liggat

Richard Lyon

José-Marie Lopez Cuesta

Heather Stapleton

Anna A Stec

Andrew P Taylor

Jürgen H Troitzsch

PROGRAMME

Monday 14th APRIL

Afternoon **Optional Tours of Local Fire Testing Laboratories (tbc)**

16.00 - 19.00 **Registration in the Darwin Foyer**

18.00 - 20.00 **Welcome Reception in the Darwin Foyer**

Tuesday 15th April

08.00 - 08.55 **Registration and Refreshments available by the Registration Desk in the Darwin Foyer**

All Lectures in the Darwin Lecture Theatre

08.55 **Welcome and Introduction**

09.00 - 09.15 **Professor Paul Kiekens, COST-Flaretex Project Coordinator**
Ghent University, Belgium

09.15 **Session 1: Overview**

09.15 - 09.45 **The Fire Retardant Spectrum: From Aluminium to Zinc, or Red to Green?**
Professor Richard Hull, University of Central Lancashire, UK

09.45 - 10.15 **Techniques for Understanding Fire Retardant Behaviour**
Ulrike Braun, BAM Federal Institute for Material Testing, Germany

10.15 - 10.45 **Fire Retardant Behaviour of Composites**
Professor Baljinder Kandola, University of Bolton, UK

10.45 - 11.15 **Refreshments, Exhibition and Posters**

11.15 - 11.45 **The Effect of Fire Retardants on the Physical Properties of Polymers**
Dr John Liggat, University of Strathclyde, UK

11.45 **Session 2: Fire Retardant Strategies**

11.45 - 12.15 **Gas Phase Flame Retardants**
Dr Sergei Levchik, ICL-IP, USA

12.15 - 13.00 **Lunch, Exhibition and Posters**

13.00 - 14.00

UCLan Fire Laboratory Tours, Exhibition and Posters

14.00 - 14.30

Fire Retardancy of Novel Hydrated Alumina in EVA

Professor José-Marie Lopez Cuesta, Centre des Matériaux des Mines d'Alès (C2MA/EMA), Institut Mines Telecom (IMT), France

14.30 - 15.00

Phosphorus Compounds as Condensed Phase Flame Retardants for Polymer-based Materials

Professor John R Ebdon, Polymer Centre, University of Sheffield, UK

15.00 - 15.30

Refreshments, Exhibition and Posters

15.30 - 16.00

Novel Nanocomposite Fire Retardants

Professor Giovanni Camino, Politecnico di Torino, Italy

16.00 - 16.30

Synthesis and Mechanism of Flame Retardant Microencapsulation and Inorganics Additives

Professor Yuan Hu, State Key Laboratory for Fire Science, University of Science and Technology of China, China

16.30 - 17.00

Layer by Layer Assembly: A Current Emerging Technique for Conferring Flame Retardancy

Dr Jenny Alongi, Politecnico di Torino, Italy

17.00 - 18.00

UCLan Fire Laboratory Tours, Exhibition and Posters

19.00

Coaches to Conference Cocktail Reception at Houghton Tower

19.30 - 20.30

Conference Cocktail Reception at Houghton Tower

20.30 - 22.30

Conference Dinner at Houghton Tower

23.00

Coaches return guests to UCLan

Wednesday 16th April

08.30

Refreshments available by the Registration Desk

09.00 - 09.30

Intumescence: A Versatile Concept for Diverse Applications

Professor Serge Bourbigot, Unité Matériaux et Transformations, ENSC Lille, France

09.30

Session 3: Applications of Fire Retardants

09.30 - 10.00

Developments in Fire Resisting Intumescent Coatings for Structural Steel

Dr Andrew P Taylor, Sherwin-Williams, UK

10.00 - 10.30

Recent Developments in N and P Based Flame Retardants

Dr Sabyasachi Gaan, Empa, Switzerland

10.30 - 11.00

Refreshments, Exhibition and Posters

11.00 - 11.30

Industrial Applications of Flame Retardants for Thermoplastics

Dr Martin Klatt, BASF SE, Germany

11.30 - 12.00

Development and Characterization of Low-Combustibility Polymer Materials for Aircraft Applications

Dr Richard Lyon, FAA, USA

12.00 - 12.45

Lunch, Exhibition and Posters

12.45 - 13.45

UCLan Fire Laboratory Tours, Exhibition and Posters

13.45

Session 4: Testing, Toxicity and the Environment

13.45 - 14.15

Fire Safety Regulations and Testing - Their Impact on the Use of Polymers and Flame Retardants

Dr Jürgen H Troitzsch, Fire & Environment Protection Service FEPS, Germany

14.15 - 14.45

Fire Retardants and Fire Smoke Toxicity

Dr Anna A Stec, University of Central Lancashire, UK

14.45 - 15.15

Environmental Concerns Regarding Chemical Flame Retardants

Professor Heather M Stapleton, Duke University, USA

15.15 - 16.00

Refreshments and Symposium Ends

16.00 - 17.00

UCLan Fire Laboratory Tours

Thursday 17th April

09.00 - 16.00

Workshop in the Darwin Lecture Theatre on 'Replacement of Halogenated Flame Retardants in Upholstered Furnishings'

(Organised by COST-FLARETEX)

Symposium Organising Committee

Richard Hull

Baljinder Kandola

John Liggat

Bruce Lane

Ruth Lane

Anna Stec

University of Central Lancashire, UK

University of Bolton, UK

University of Strathclyde, UK

RSC Speciality Chemicals Sector

RSC Speciality Chemicals Sector

University of Central Lancashire, UK

Conference Location

The conference is being held at the University of Central Lancashire (UCLan) in Preston. Preston is a city in the north west of England about an hour from Manchester and Liverpool. There is one major international airport – Manchester, and two others - Liverpool and Blackpool within an hour of Preston. There are direct rail links from Manchester Airport, London, and elsewhere to Preston.

A map and further information on how to get to UCLan at Preston by air, road, rail can be found at http://www.uclan.ac.uk/visit/how_to_find_us.php For train bookings and schedules visit <http://www.thetrainline.com/>.

The map on the following page shows the UCLan campus. The science area of the university is situated in the blue buildings on the map. The lectures and exhibition will be held in the Darwin Building, the Fire Laboratories are in the J B Firth Building and lunches will be in The Refectory in Foster Building. The map will also be sent as part of the Joining Instructions.

Car Parking

If you need car parking at UCLan you MUST let the conference secretary know by 1st April as we have to reserve spaces for named delegates in advance.

Tours to Commercial Fire Testing Laboratories

Tours to local Commercial Fire Testing Laboratories are being arranged. Please contact the conference secretary if you are interested in such a tour and we will let you know availability and timings as soon as arrangements have been finalized. Coaches will take people from UCLan to the commercial facilities on the afternoon of Monday April 14th and return them afterwards in time for the welcome reception.

Lectures, Exhibition and Posters

Lectures will be held in the Darwin Building Lecture Theatre. The Exhibition and Poster Display, which will run alongside the conference, will be in the foyer adjacent to the Lecture Theatre. To aid networking between delegates, exhibitors and poster presenters, the Welcome Drinks Reception on the evening of Monday 14th April, and all refreshments and after lunch coffee and tea on Tuesday 15th April and Wednesday 16th April will be served in the foyer. This will enhance the profile of the novel research from poster presenters and give delegates more opportunities to see the exhibitors stands.

If you would like to be an exhibitor or present a poster please contact the conference secretary directly.

Meals and Refreshments

On Monday 14th April there will be a welcome drinks reception with canapés from 6.00pm to 8.00pm in the foyer of the Darwin Building.

Coffee and tea will be available in the foyer of the Darwin Building throughout the conference and lunch will be served in the Refectory in Foster Building on Tuesday 15th and Wednesday 16th April.

The conference cocktail reception and dinner on Tuesday 15th April will be at Hoghton Tower. Coaches will take delegates from UCLan to and from Hoghton Tower.

Shop and Refectory

There is a shop and a restaurant (The Refectory) in the Foster Building which will be open during the conference and delegates can use as required.

KEY

-  ATM
-  Bus routes
-  Bus stops
-  Bus number
-  eat@UCLan
-  Cycle compounds/lockers*
-  Cycle racks
-  Disabled parking
-  Electric vehicle charging points
-  Entrance to buildings
-  Main reception
-  Medical Centre
-  Park and Ride
-  Preferred walking routes
-  Public car parks
-  Security Control Centre
-  The 'i'
-  Dental Clinic

*see www.uclan.ac.uk/bug for access details



BLUE ZONE - Harris Site

- CB Chandler Building
- DB Darwin Building
- EB Edward Building
- FB Foster Building
- JBF JB Firth Building
- HB Harris Building
- LE Leighton Building
- LH Livesey House
- MB Maudland Building
- MC Medical Centre
- PSC Pre-School Centre
- SB Stewart Building
- STF Sir Tom Finney Sports Centre
- WB Wharf Building
- Bm Boatmans Court
- Bw Bowran House
- Lw Lawson Hall
- 6 Darwin Car Parks
- 8 Foster Car Park (reserved spaces for visitors)
- 13 Leighton Car Parks
- 14 Livesey Car Park
- 21 Harris Car Park
- 25 Fylde II Car Park

GREEN ZONE - Media Factory Site

- CM Computing and Technology Building
- HR Hanover Building
- KM Kirkham Building
- ME Media Factory
- MO Moss Building
- PE Peel Building (Mailroom)
- Pn Pendle Hall
- Rr Roeburn Hall
- 5 Computing & Technology Car Park
- 11 Hanover Car Park
- 15 Moss Car Park
- 16 Roeburn I Car Park (Pedder Street)
- 17 Roeburn II Car Park (Pedder Street)

ORANGE ZONE - Adelphi Site

- AB Adelphi Building
- AC St. Peters Arts Centre
- FY Fylde Building
- LIB Library & Learning and Information Services (LIS)
- MF Multi-Faith Centre
- PH University Police House
- SU/53^o Students' Union/53 Degrees
- VB Victoria Building
- Dw Derwent Hall
- Dr Douglas Hall
- 1 53^o I Adelphi Car Park
- 7 Douglas Car Park
- 9 Fylde Car Park
- 19 Victoria Car Park
- 24 Victoria II Car Park

PURPLE ZONE - Harrington Site

- AL Allen Building
- BB Brook Building
- GR Greenbank Building
- HA Harrington Building
- VE Vernon Building
- Er Eden Hall
- iQ iQ Preston
- Ri Ribble Hall
- Wr Whitendale Hall
- 3 Ribble Car Park
- 4 Brook Car Park
- 10 Greenbank Car Parks
- 12 Harrington Car Park
- 18 Vernon Car Park (Berkeley Street)
- 20 Whitendale Car Park
- 22 Ashmoor Street Car Park (temporary)
- 23 Vernon Car Park (Moorbrook Street)

Please note that the shaded area represents the University campus boundaries and does not indicate University owned land. Based upon Ordnance Survey maps by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office © Crown Copyright, Licence No. ED 100018837.

Registration

The registration desk in the foyer of the Darwin Building, adjacent to the Lecture Theatre, will be open from 4.00pm to 7.00pm on Monday 14th April and will reopen at 8.00am on Tuesday 15th and remain open while the conference is in progress.

On registration participants will receive a name badge and a conference bag containing:-

- 1) Conference Preprints with copies of the slides of the speakers presentations and information on the posters.
- 2) A list of participants and exhibitors.
- 3) An invitation to the Cocktail Reception and Conference Dinner at Houghton Tower.

Accommodation

Details of hotels closest to the conference venue are given in the left hand column of the table below. Please make your own accommodation arrangements, explaining attendance at the UCLan conference to ensure access to any discount.

LEGACY PRESTON INTERNATIONAL (nearest) Marsh Lane Preston, PR1 2YF Tel 0844 4119028 Fax 0870 832 9929 www.legacy-hotels.co.uk	WEST PRESTON PREMIER INN Blackpool Road Lea Preston Tel: 01772 720476	TICKLED TROUT HOTEL (Off Jct 31, M6) Preston New Road Samlesbury Preston Tel: +44 (0) 1772 877671 Fax: +44 (0) 1772 877463 www.macdonaldhotels.co.uk
PREMIER INN PRESTON CENTRAL (city centre) (newest) Fox Street Preston, PR1 2AB Tel: +44 (0) 871 527 8908 Fax: +44 (0) 871 527 8909 www.Premierinn.com	PRESTON MARRIOTT (near Jct 32, M6) 418 Garstang Road Broughton Preston Tel: +44 (0) 1772 864087 Fax: +44 (0) 1772 861728 www.marriott.co.uk (Disabled Facilities available)	THE PARK HOTEL 209 Tulketh Road Ashton Preston Tel: +44 (0)1772 726250 www.theparkpreston.com
HOLIDAY INN PRESTON (city centre) The Ringway Preston Tel: +44 (0) 871 9429066 www.ichotelsgroup.com reservations@hipreston.com (Disabled Facilities available)	IBIS PRESTON NORTH (off Jct 32, M6/Jct 1 M55) Garstang Road Broughton Preston Tel: +44 (0) 1772 861800 Fax: +44 (0) 1772 861900 www.ibishotel.com (Disabled Facilities Available)	BARTON GRANGE (near Jct 32, M6) Garstang Road Broughton Tel: +44 (0) 1772 862551 www.bartongranchotel.com (Disabled Facilities available)
PRESTON CENTRAL TRAVEL LODGE (near city centre) (cheapest) Preston Farmers Office New Hall Lane Preston PR1 5NX Tel +44 (0) 871 9846150 Fax +44 (0)1772 794381 www.travelodge.co.uk		TRAVEL INN (off Jct 31A, M6) Bluebell Way Preston (East) Link Road Fulwood Preston Tel: +44 (0)8701 977215 Fax: +44 (0)1772 651619 www.travelinn.co.uk

More local and hotel information can be obtained from the Preston Tourist Information Centre, tel: 01772 253731, email: tourism@preston.gov.uk; www.visitpreston.com

Taxis

Local Taxi information: New City Taxis tel: 01772 824000
AAA Taxis tel: 01772 555111

Information on Houghton Tower location of the Conference Cocktail Reception and Dinner

The de Houghton family has lived in the area for over a millennium and the family name became Houghton in the reign of Queen Elizabeth I and the magnificent Houghton Tower was built.



Houghton Tower



The Banqueting Hall showing the King's Table and the Minstrel's Gallery

Please contact Ruth Lane (ruth@cowlane.co.uk) if you would like to

SPONSOR

EXHIBIT

OR PRESENT A POSTER ON CURRENT RESEARCH

THERE WILL BE A PRIZE FOR THE BEST STUDENT POSTER

REGISTRATION FEES

Standard Rate	£600
RSC/SCI members or COST MP1105 industry members	£500
Students or EU COST MP1105 research members	£200
Students Presenting a Poster	£150
Speakers	Free

Registration is open at <http://tinyurl.com/frt2014>

Conference Secretary:-

Dr Ruth M Lane, e-mail: ruth@cowlane.co.uk

Up to 12th April: tel/fax: +44 (0) 1928 788071;

12th–17th April only, mobile number +44 (0) 7935 448 264 or +44 (0) 7935 275 444