

Understanding flame retardants



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**The International
Bromine Council**



Agenda

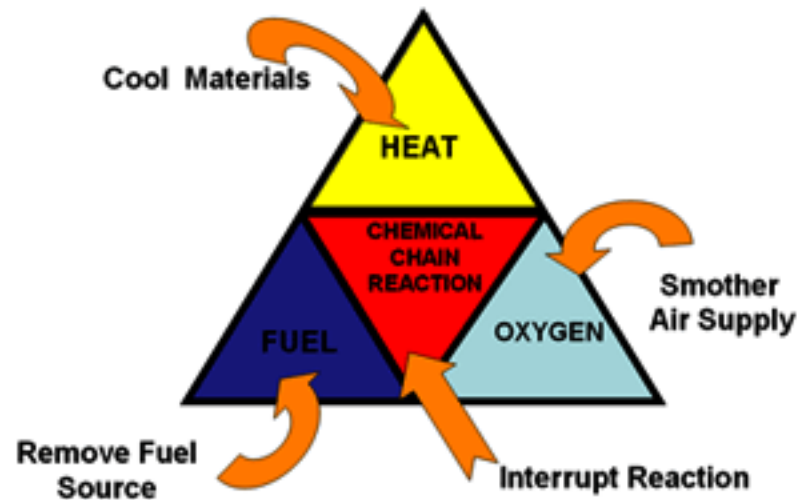
- Overview of flame retardants
- Case studies – furniture flammability
- Review of Irish Furniture Regulations
- Conclusions



Flame retardants

- **FRs - what are they ?**
 - Chemicals that inhibit ignition
 - Common sources such as cigarettes , small open flames and portable chargers
 - Typical chemistries : bromine, chlorine, phosphorus, nitrogen, inorganics
 - Used across a range of applications like E & E, B & C, furniture
 - Time to escape is key especially for vulnerable– children, elderly
 - Modern homes pose a higher fire load due to the number of flammable synthetics ; therefore fire prevention is a critical layer in the philosophy of fire safety

How flame retardants work



- Interruption of radical mechanism of combustion in the gas phase
- Reaction in the solid phase to form a carbonaceous char
- Endothermic processes, such as release of water



Regulation of flame retardants

- Safety of all chemicals, including FRs, is assured by chemicals legislation
- EU REACH: most comprehensive chemicals framework globally
- Supervised by EU Regulator (European Chemicals Agency, ECHA)
- Burden of proof placed on the “registrant” to demonstrate safety
 - To ensure that chemicals are safe for use in their specific applications
 - Principle of acceptable risk
 - Substances of Very High Concern targeted for phase out and substitution





Flame retardants in the spotlight

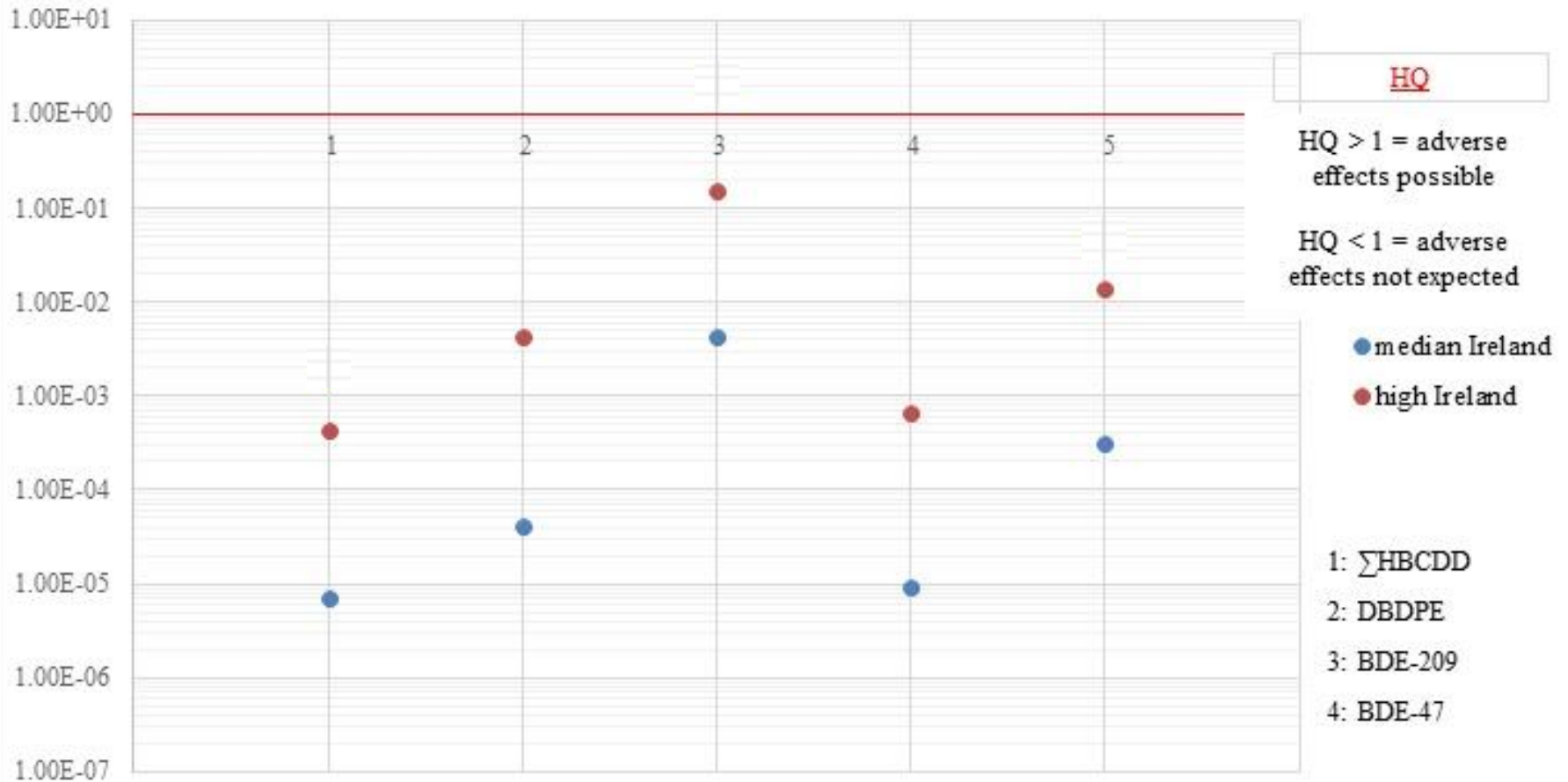
- Concerns about FRs arise due to exposure
- Risk = Hazard x Exposure
- Trace quantities of BFRs are sometimes detected in the home or natural environment – these are usually orders of magnitude lower than levels that would pose a risk
- Innovation and substitution
 - Molecules with improved hazard / exposure profiles
 - Polymeric molecules = lower hazard
 - Reactive applications = lower exposure

Flame Retardants – study in Irish schools

(Wemken et al)



Hazard Quotients School Children



FRs in the spotlight

“Toxic chemicals in everyday life”

UK Parliamentary Select Committee Inquiry
(Environmental Audit Committee)

14th May 2019

Panel of MPs taking evidence from invited stakeholders:

- UK Furniture Regulations
- Role of flame retardants in furniture
- Current testing regimes

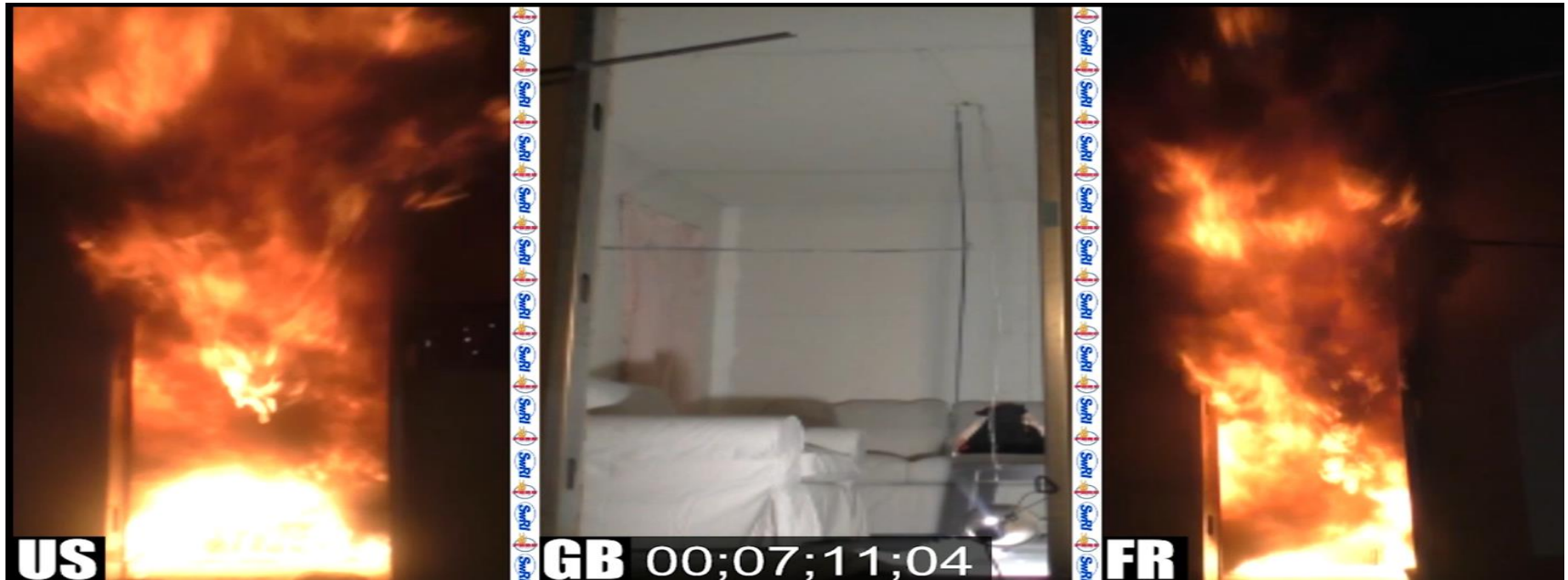
Final report to UK Govt. contains 27 recommendations, including:

- Publish responses to 2016 Public Consultation
- Develop labels for chemicals in furniture
- Review UK FFRs to align them with EU



Fire safety studies and data : UK vs US vs FR

South West Research Institute (SWRI) , study 2019



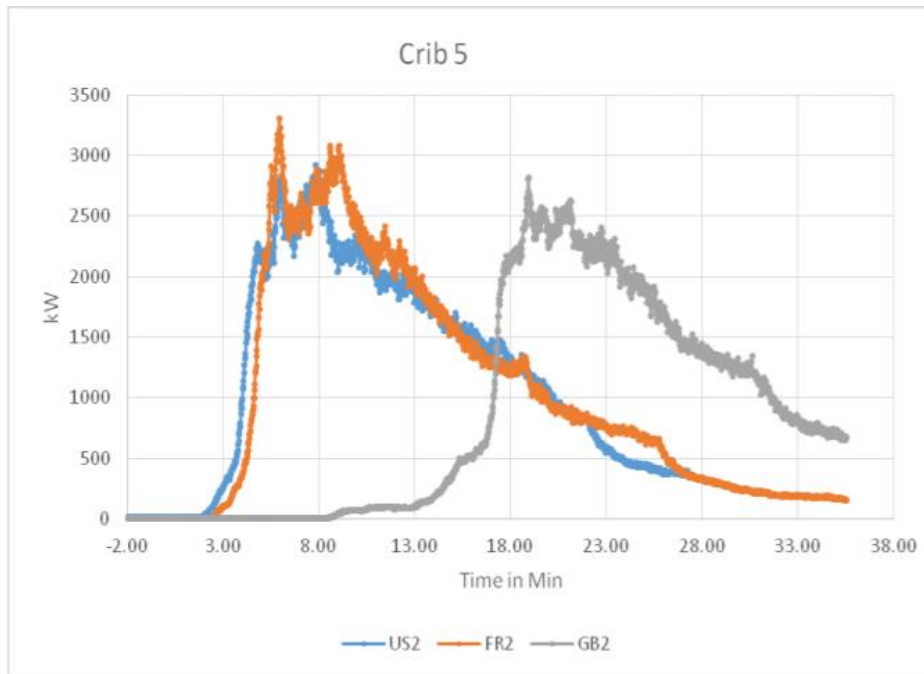
VIDEO

<https://www.bccresearch.com/public/images2017/impact-of-fire-regulations.mp4>

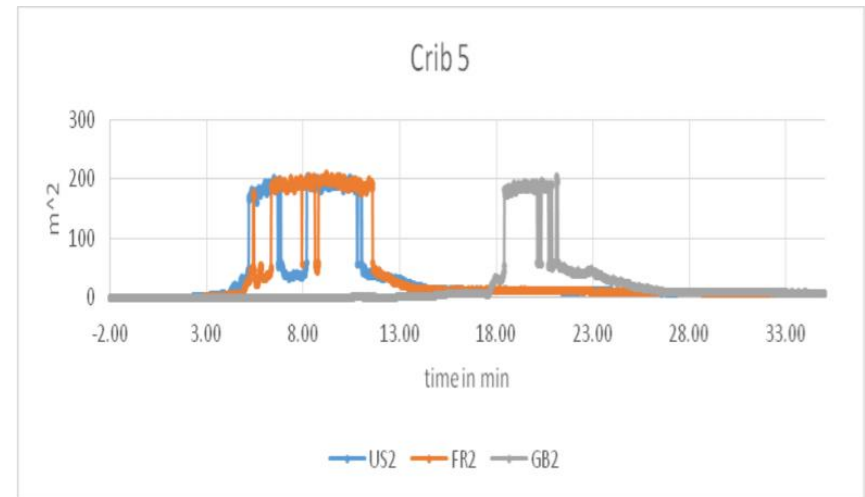
Fire safety studies and data : UK vs US vs FR

South West Research Institute (SWRI) , Texas study (2019)

Heat release rate



Smoke production



Fire safety studies and data : UK vs US vs FR



SWRI Study (2019)“Comparative Room Burn Study of Furnished Rooms from the UK, France and the US”; M. Blais, K. Carpenter, K. Fernandez

- UK standards: 4 times more protective than FR/US
- Time to ignition:16 minutes longer in UK
- Less smoke produced in UK furniture

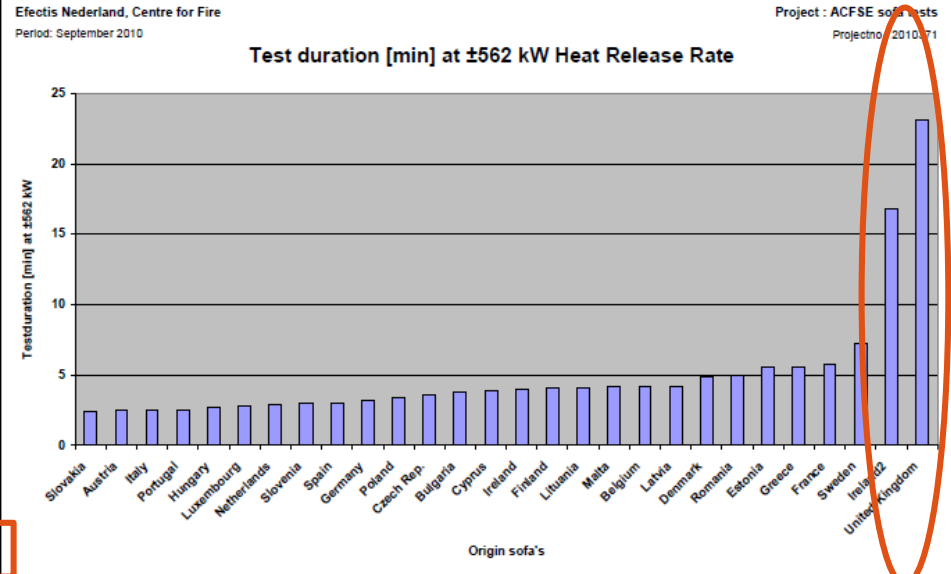
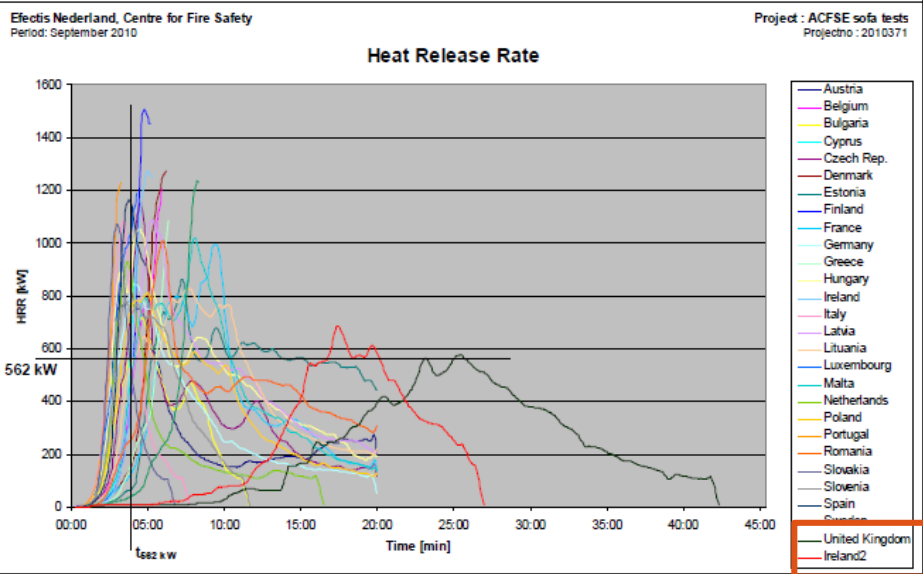
Figure 2



Sample chair, couch and 55 inch television

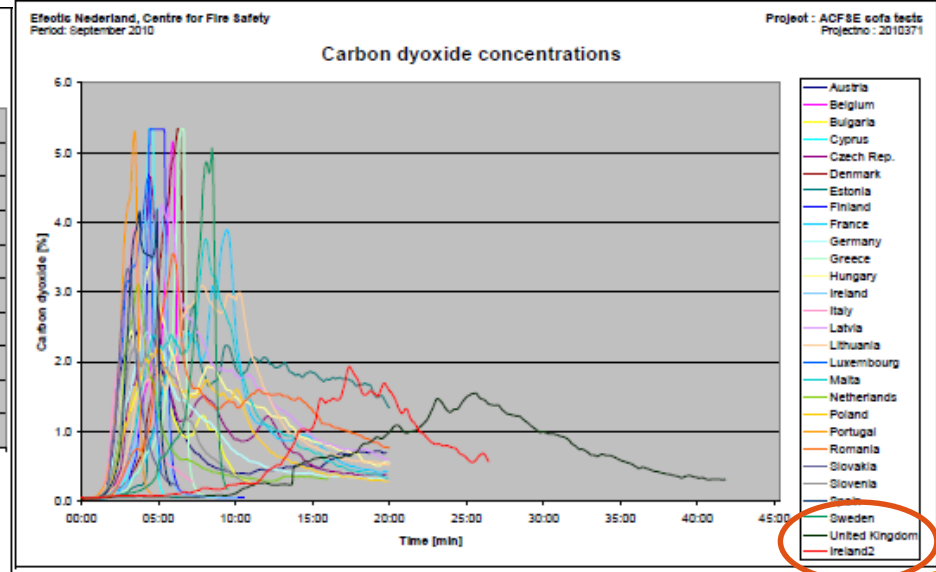
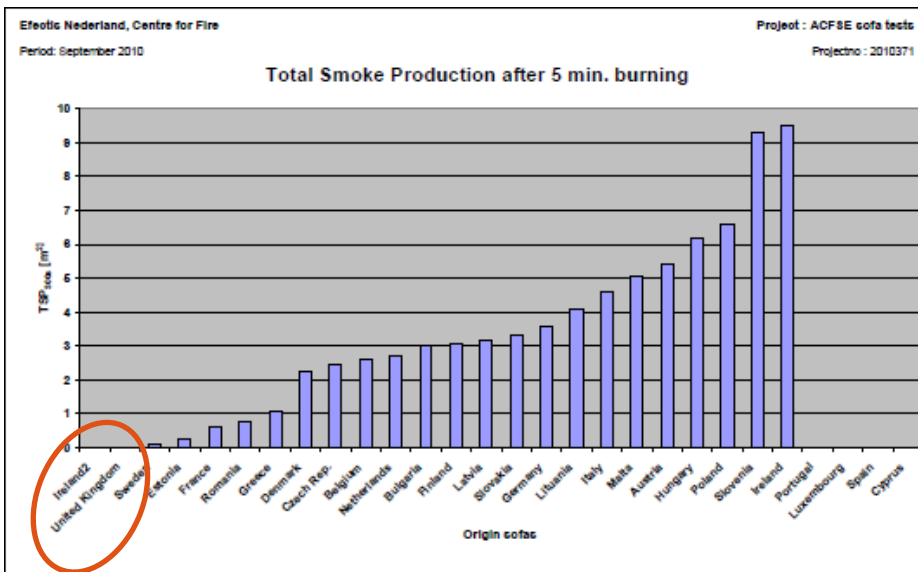
Fire safety studies and data : UK & IRL vs EU

ACFSE-Efectis report (2010) "Reaction to fire testing of sofas"



Fire safety studies and data : UK & IRL vs EU

ACFSE-EFFECTIS report (2010)



Fire safety studies and data

Fire fatality rates: UK / IRL vs. US / EU

Country/Region	Deaths due to fire in the home (previous 3 years' data, ave.)	Population (millions)	Fire deaths per million head of population
USA	3,343 (NFPA)	327	10.2
EU 28, minus UK and Ireland	4,600 (est.)	442	10.4
England & Wales	286 (DCLG)	59	4.8
Ireland	27 (DHP&LG)	5	5.4

Note : EU and US (California) have smoulder only standards, unlike the UK and Ireland which include an open flame test



Review of the Irish Furniture Regulations

- Department of Business, Enterprise & Innovation seeking views on suitability of SI No 316/1995 and IS 419:2011 (Irish FFRs)
- **Our position:**
 - BSEF understands the need for dialogue on updating, 25 years since enactment of FFRs
 - Irish FFRs have shown to be remarkably effective in reducing the incidence of fire fatalities
 - Domestic fire risk has increased in the last generation
 - Any changes to the FFRs must guarantee a high level of fire safety for the most vulnerable
 - This is a question of fire safety – chemical safety is in the domain of other bodies
 - FRs on the market place deemed safe following the REACH process
 - BSEF is calling for greater enforcement of existing regulations
 - We remain open to working with the Irish authorities throughout the review process

Conclusions

- Flame retardants – a critical layer in fire prevention
- Chemical legislation offers reassurance that FRs have been properly risk assessed
- FR industry adapting and innovating
- UK and Irish FFRs: 30 years of data demonstrating their effectiveness
- We need both fire risks and chemical risks to be properly managed, no trade offs...



Thank you

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