



# FIRE SAFETY IN CONSTRUCTION AND BUILDING WITH ICL-IP SOLUTIONS



**Brominated Flame Retardants**



**Phosphorus Flame Retardants**



**Magnesium Flame Retardants**



**Nitrogen Flame Retardants**



**ICL Industrial**  
P R O D U C T S

CARING FOR YOUR FUTURE TODAY

Today's society acknowledges the importance of keeping our buildings as safe as possible by minimizing flammability.

Indeed, recent worldwide fire statistics state that more than 60,000 people have died in more than 2.5 million fires having their origin in buildings and dwellings (Source CTIF).

ICL-IP sees its mission to fight against this lack of fire safety and fit the most suitable products to the different materials and building techniques which are available in the market today and will be developed for the future.

Side by side with the importance of safety there is a growing awareness of the need to minimize carbon footprint and emissions of greenhouse gases. ICL-IP is committed to develop the right products in order to assist in this important effort, while aiming for cleaner and environmentally friendly flame retardants.

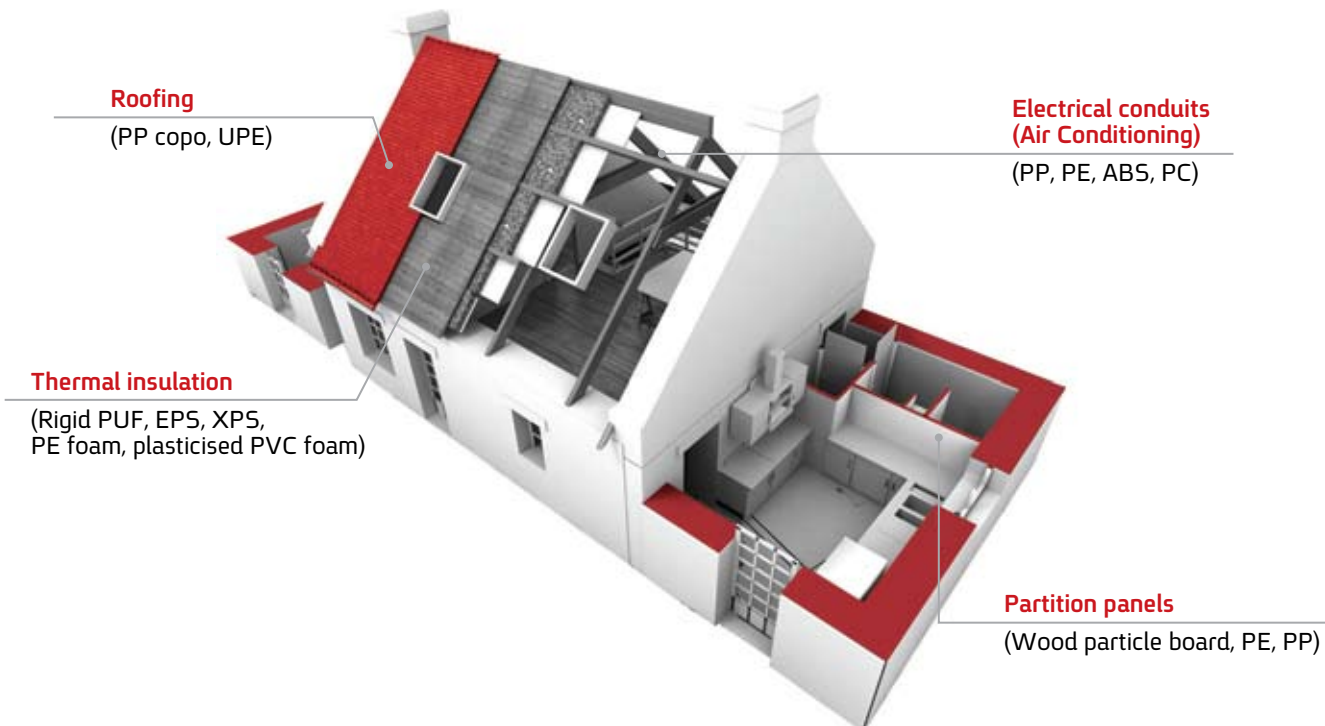
ICL-IP is pleased to share with you its list of products developed for the construction field.

During the years, ICL-IP has developed a wide and comprehensive applications database. The following aspects are addressed in this database: high working temperature, thermo-mechanical properties, chemical resistance, recycling of scrap, light stability, non-surface migration properties and smoke toxicity reduction.

Registered customers have a free access to this technical database and are entitled to download a full and explicit set of Application Data Sheets by clicking on each product's name.

## FLAME RETARDANTS FOR THE BUILDING AND CONSTRUCTION FIELD

Application	Polymer type	FR tradename
Roofing materials		
Opaque roof sheeting & film	PP copolymers, PE	<b>FR-20; FR-1210; FR-1410; Polyquel® 145; FR-720</b>
	UPE & vinyl esters	<b>FR-1210; FR-1410; F-2001</b>
Translucent roof sheeting & domes	UPE & vinyl esters	<b>FR-522; F-2001; Fyrol® FR-2; Fyrol® 38; Fyrol® PCF</b>
Thermal insulation	PUR & PIR	<b>Fyrol® PCF; Fyrol® 6; SofRon® 6605; FR-513</b>
	XPS & EPS	<b>FR-1206; FR-122P; F-2200HM</b>
	PE foam (crosslinked or not)	<b>FR-1410; FR-1210; FR-1025; FR-20</b>
	Crosslinked plasticized PVC/ nitrile rubber foam	<b>Phosflex® 71B; Phosflex® 390; FR-1410; FR-1210; FR-20</b>
Acoustic insulation	PE foam	<b>FR-1410; FR-1210; FR-1025; FR-20</b>
Cladding & partition panels	Wood particle board	<b>FR-11</b>
	PE	<b>FR-1410; FR-1210; FR-20</b>
Electrical conduits, ducting & W&C	PP	<b>FR-370; FR-1410; FR-1210; FR-20</b>
	PP, PE & copo	<b>FR-720; FR-370; FR-20; FR-1410</b>
Piping & fittings	PE	<b>FR-1410; FR-1210; FR-20</b>
	PP	<b>FR-720; FR-370; FR-1410; FR-1210</b>
Decorative trimmings & plinths	EPS & XPS	<b>FR-1206; FR-122P; F-2200HM</b>
Air conditioning elements	PE	<b>FR-20; FR-1410; FR-1210</b>
	ABS	<b>FR-245; F-2016; F-2400</b>
Electrical enclosures	PC	<b>Fyrolflex® RDP; Fyrolflex® Sol-DP™</b>
	UPE & vinyl esters	<b>FR-1410; F-2001; FR-522</b>
Electrical circuit breaker	ABS	<b>FR-245; F-2016; F-2400</b>
	Polyamide, PBT	<b>FR-1410; FR-803P; F-3100; F-2400; FR-1025; FR-20</b>
Flooring	Plasticized PVC	<b>Phosflex® 31L/41L; Phosflex® 390; Phosflex® 418</b>
Upholstery & textiles	Textile back-coating	<b>FR-1210; TexRon® 9020 &amp; 9025; TexRon® P &amp; P+</b>
	PP fibers for carpet	<b>FR-370</b>
Mattress; sofa	Flexible polyurethane foam	<b>Fyrol® PCF; Fyrol® FR-7; Fyrol® HF-4 &amp; 5; Fyrol® PNx-(LE)</b>
Stadium and public building seats	PP	<b>FR-370</b>
Industrial strip doors, curtains and rolls	Plasticized PVC	<b>Phosflex® 31L/41L; Phosflex® 390; Phosflex® 418</b>
Shadow nets	PP; PE	<b>FR-370;</b>
Decking	Wood plastic composites	<b>FR-1410; FR-1210; FR-20</b>
Wallpaper	PVC	<b>Phosflex® Series (31L/41L, 71B, 390)</b>



## RELATED PRODUCTS MAIN FEATURES

### Brominated flame retardant reactive

- FR-522** High purity, high level of flame retardancy, high clarity and UV/light stability for outdoor UPE applications
- FR-513** High FR efficiency, solid FR

### Brominated flame retardant additives

- FR-11** Water soluble & highly efficient FR for cellulosic, chipboard & textile applications
- FR-245** Thermal and UV stability, imparts good flow and impact strength, non-blooming FR, option for low antimony trioxide or antimony trioxide-free solutions
- FR-370** FR efficiency in V-2 PP, UV stable, non-blooming and option for antimony trioxide-free systems in fiber production
- FR-720** High FR efficiency and thermal stability
- FR-1410** High FR efficiency and thermal stability, multi-purpose
- FR-1210** High FR efficiency and thermal stability and most popular for textile back-coating applications
- FR-1206** High FR efficiency, available in different purity grades for the EPS and XPS applications
- F-2001** UV stability and soluble in styrene for UPE & vinyl ester applications

### Brominated polymeric flame retardant additives

- FR-122P** Efficient polymeric FR for EPS & XPS applications, non blooming and non leaching
- FR-803P** Very high thermal stability, non-blooming, good electrical properties
- FR-1025** Excellent thermal aging stability, processing aid, high FR efficiency, high impact properties, non-blooming, compatibility with fiber reinforcement and good recycling
- F-2000 series** High thermal and UV stability, high FR efficiency, melt blendable and non-blooming
- F-3000 series** High thermal and good UV stability, low metal adhesion, non-blooming

### Phosphorus based flame retardant additives

- Fyrol® PCF** Excellent thermal and hydrolytic stability and low viscosity
- Fyrol® 2** For flexible PUF with excellent processing, good thermal and hydrolytic stability, low fogging
- Fyrol® 38** For flexible PUF, low scorch with excellent processing, good thermal and hydrolytic stability, low fogging
- Fyrol® 6** Reactive non halogen excellent for spray, pour-in-place systems and slab foams
- Fyrol® 7** For flexible PUF with good compression set & low scorch
- Fyrol® A300TB** Easy processing, meeting fogging requirement
- Fyrol® HF-4** Halogen-free for flexible PUF, good processing, low viscosity and scorch
- Fyrol® HF-5** Halogen-free for flexible PUF, good processing, low viscosity and VOC emissions
- Fyrol® PNX-(LE)** Halogen-free, low emission and fogging
- Fyrolflex® RDP** Halogen-free, high FR efficiency and thermal stability
- Fyrolflex® Sol-DP™** Halogen-free, easy to handle free-flowing powder, good hydrolytic and thermal stability
- Phosflex® 71B** High thermal stability
- Phosflex® 390** Good performance at low temperature, low smoke
- Phosflex® 31L/41L** High thermal stability and good solvating properties
- Phosflex® 418** Excellent plasticizing efficiency at low temperature, low smoke and volatility

### Mineral flame retardant additive

- FR-20 series** High purity grades of magnesium hydroxide with option of surface treatment and high abrasion resistance, smoke suppressant and high thermal stability

### Tailor-made solutions

- Sarcon® 6605** Highly efficient & reactive FR for rigid PUF
- Polyquel® series** Non-dust, non-blooming, high thermal and UV stability, FR efficiency
- TexRon® 9020 & 9025** Non deca BDE tailor made FR system with optimal melting range for textile back coating applications with excellent durability
- TexRon® P & P+** Water based acrylic polymer emulsions for cotton/polyester fabrics with clear finish and durable for 50 laundry cycles



## MAIN FIRE SAFETY STANDARDS

In the following table, you will find a summary of the fire safety standards by categories of applications. More information about fire safety standards can be found in the Plastics Flammability Handbook of Jürgen Troitzsch, 3<sup>rd</sup> edition published by Hanser.

CATEGORIES	FIRE SAFETY STANDARD
General	NFPA 557
Fire performance of Floor and Walls coverings	ISO 9239 (International); ASTM D 2859 (US);
Insulation	ASTM E-84 (US)
Non Combustibility of Materials	ISO 1182 (International)
Heat and Smoke release	UL 2043 (US)
Fire Performance of Building Materials and Components	DIN 4102, parts 1-20 (Germany); BS 476, parts 7-33 (UK)
Fire Classification	EN 13501
Toxicity of fire effluents	IEC 60695-7-2; IEC 60695-7-3; IEC 60695-7-4 (International); ASTM E 1687-97 (US)
Fire performance of rigid/thick samples	NF P 92-0501 (Epiradiateur Test, France)
Flexible PU foam	DIN 75201-G (Germany)
Textile back coating	BS 5852; California TB 117; NFPA 701-04 and ASTM D6413-99
Electrical breaker & enclosure	UL-94
Wire & cables	ISO 6722 (International); ASTM D2863 (US)

ICL-IP invites you to make use of the “Flame Retardants brochure” and benefit from its long experience in order to optimize your choice of flame retardant solutions. Moreover our **Technical Support Network – TECNET** is a team of highly professional technical experts always available all over the globe to advise and help you.



**Carpet**  
(PP, polyester)



**Electrical breakers, connectors**  
(Polyamide, PBT)



**Canopies, Covers**  
(PP, Textiles)

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## GLOBAL PRESENCE



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