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CREPIM
Your key partner for guarantying safer fire-proof materials and assemblies

Home | Testing division | Certification division | Development division | Training division

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Key player on the European level, CREPIM develops, guaranties and qualifies the fire performances of materials and assemblies

The increasing research on materials used in various applications leads to a strong increase in the use of organic polymers. However, the evolution of the regulations towards a greater fire-safety tends to control the use of many materials and consequently imposes a technological survey and permanent improvements.

In this context, **CREPIM is the key player for development and approval of materials covered by fire regulations. CREPIM develops, guaranties and qualifies the fire performances of materials and assemblies for all concerned areas,** featuring the mass transportation sectors (railway, aviation and maritime), as well as in the construction, electric products, and textile sectors. All these studies take into account **the end of life management of the product** in order to be in line with the potential "second life" of the material and with its impact on the environment.

Its activities feature 5 areas, all of which focus on fire safety and materials, taking into account the end of life

- ✓ Fire reaction with aspects regarding to:
  - Flame propagation
  - Smoke opacity
  - Smoke toxicity
- ✓ Fire resistance including the maintain of the integrity in case of fire
- ✓ Thermal transfer
- ✓ Surface functionalisation
- ✓ Recycling and the taking into account the end-of life of fireproof materials

This offer, which covers the whole chain from upstream to downstream, is unique in Europe. The CREPIM board, which gathers academic, institutional and private owner partners, creates a base on which CREPIM's teams can build up a scientific knowledge to turn over cutting-edge services towards customers. Contracts with partners feature a large array of collaboration types, from spot testing and consulting, up to technological development and long-term study.

The laboratory works on thermoset and thermoplastic resins, on composite materials, as well as fire-retardant paints. CREPIM's aim is the development of fire-retardant materials that do not release opaque and toxic smokes.

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Our main objective: Support your company throughout the whole range of fire services from product development up to the final qualifications

For manufacturers, CREPIM represents a key opportunity to be in direct contact with the requirements of the various European markets, and also guarantees them a straight access to these markets. CREPIM releases each year more than 1500 tests reports worldwide. The test reports released by the CREPIM are recognised worldwide:

- CREPIM is accredited by the COFRAC since 1990 on 20 fire tests featuring National, European and international regulation:
  - This accreditation encompasses the ISO CEI 17025 compliance since 200,4
  - The accreditation scope has been enlarged in 2006 to include the new European railway standard EN 45545-2, for which CREPIM was the first French laboratory to be accredited,
  - The scope accreditation was enlarged in 2007 to the fire testing dedicated to the CE marking of construction production in the framework of the European construction Product Directive,
- CREPIM has been recognized in 2003 for the testing and qualification for railway industries by the French certification body CERTIFER – NF F 16 101; 102 and 201 testing. CREPIM participates in various inter-laboratory testing campaigns to sustain the reliability of the testing devices for National regulation and also for the new EN 45545-2 European railway regulation,
- CREPIM was recognized in 2007 by Veritas for the testing and qualification for the International Maritime Organization (IMO),
- Since 2009, CREPIM is a notified body for the initial testing type in the framework of the construction product directive,
- Since 2010, CREPIM is recognised by the French Home Office for fire testing and for delivering the official test reports.

A flexible organisation to give better support to our customer

CREPIM's highest priority is to work in close collaboration with companies, enabling them to validate their materials to meet European fire-safety requirements in various areas of use. CREPIM represents a unique channel to the markets. In order to reinforce our service base and to shorten the lead time to market access, a new organisation was settled in 2010.

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This new organisation features four divisions: (i) Development, (ii) Testing division, (iii) CE marking- Construction Product Regulation –and Certification division and (iv) Training division. The whole team includes 20 people featuring, for a large part, chemists, (MSc, doctors and senior scientists).

The Development division – it is our original activity – supports you in the development of FR formulas:

- Formulation of materials and products to meet fire test requirements and codes,
- Development and benchmark of flame retardant solutions taking into account REACH and ROHS regulations and the end of life management of the product in order to be in line with the potential "second life" of material.

Focus on FR resins development, either thermoplastic or thermoset, based on all technologies, featuring mainly intumescence. Please note that CREPIM is approved for Research Tax Credit for our development actions.

The Testing division provides you with a complete set of fire testing methods; to characterize the reaction to fire of you materials and assemblies.
Ours teams are fully skilled, trained and recognized to deliver to you a direct access to market:

- **For the European Railway:** Fire testing according to EN 45545-2, including annexes A & B for seat
- **For the French Railway:** Fire testing according to NF F 16 101/102 and 201,
- **For the American Railway:** Fire testing according to NFPA 130, including ASTM E 162 radiant panel,
- **For the Aviation industry:** Fire testing according to FAR 25.853 + annex F,
- **For the Shipping industry:** Fire testing according to 2012 FTP codes, including EN ISO 5658-2 radiant panel,
- **For the Construction industry** (CREPIM= NB 2137) **:** Fire testing according to Euroclasses, including EN 13823 SBI fire test and EN ISO 60332-1-2 for cable/ Fire Resistance test according EN 1364-1, EN 1364-2, EN 1634-1,
- **For the Car industry:**, Fire testing according to NF ISO 3795/ FMVSS 302,
- **For the Bus industry** : Fire testing according to R 118,
- **For the E&E equipment industry:** Fire testing according to NF EN 60695-2-12, UL94,
- **For Batteries – e-Mobility and static-** UNECE R100, UL 2580, NF EN 62619, EN 50604-1, ISO 12405, SAE J2464,
- More than 50 other fire test methods are available for seating, upholstery...

Accreditation 1-5860
Scope on www.cofrac.fr

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> ***We have set up different levels of offers to fit with you request of fair price, lead-time and quality. Feel free to contact us for any request.***

The Training division upgrades you skills regarding:

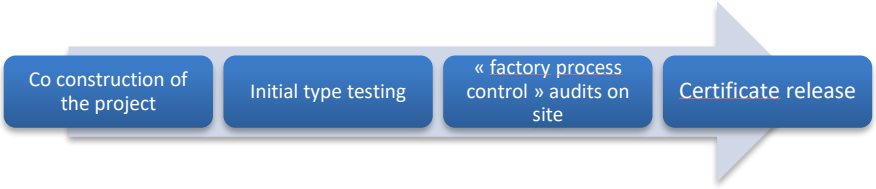
- Fireproofing chemistry and strategies - Flame retardant systems,
- Fire testing method and standardisation,
- Fire regulation,
- Control laws relating to the triptych [material-material reaction to fire].

> ***More than 20 training sessions focused on fire: feel free to enquire for any requests and become a fire expert. Our training actions are realized under the Qualiopi certification.***

Qualiopi processus certifié
RÉPUBLIQUE FRANÇAISE

The **Certification division,** which features:

- Impartiality, confidentiality, independence,
- Highly skilled team of worldwide specialists,
- A single project leader to pass all the certification steps.



> ***Our service is completely integrated, with a sole contact point, which makes the procedure easy to handle form your side.***

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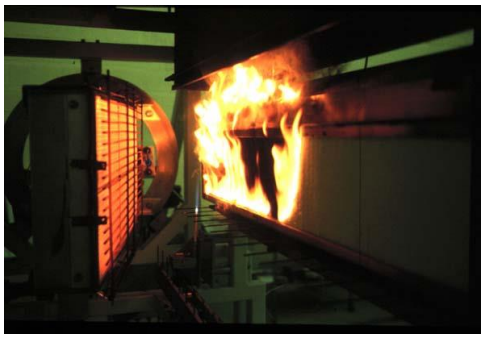
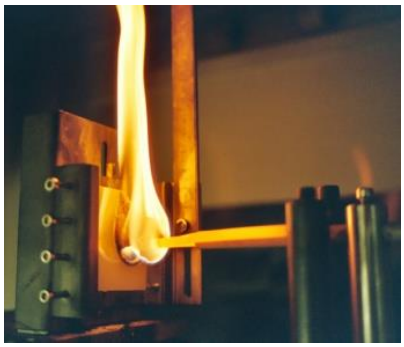
Testing division

CREPIM : 2 laboratory (1400 and 1000 m^2) of cutting edge teams and development & testing facilities dedicated to fire safety

20 people focus on your success



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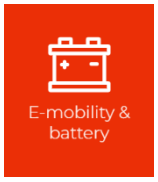
Reaction to fire testing methods

Batteries and static accumulators

- UNECE R100 e-mobility
- UL 2580, NF EN 62619 – static systems
- ISO 12405, SAE J2464…..



Railways:

CERTIFER recognition

NF F 10 101/1°1/201 French Railways standards

M rating

EN ISO 1716
NF P 92-501
NF P 92-503
NF P 92-504

I classification according to NF F 16-101

NF EN 60695-2-1-10/11
NF EN ISO 4189-2

F classification according to NF F 16-101

NF X 10-702
NF X 70-100

EU Railway Interoperability directive: NF EN 45-545-2 2016 & 2020 version: 95% of the requirements covered at CREPIM

R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R17, R18, R19, R21, R22, R23, R24, R25,R26

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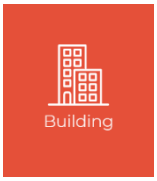
NFPA130 / FRA 2002 US railways standards

ASTM C 1166	Vertical flame spread propagation
ASTM E 162	Radiant panel
ASTM E 648	Flooring radiant panel
ASTM E 662	Smoke box
BSS 7239	Smoke box+ smoke toxicity assessment
ASTM E 1354	Cone calorimeter

Construction area – Construction Product Regulation CE marking **NB 2137**

Euroclasses EN 13501-1



EN ISO 11925-2
EN ISO 1716 including cable
EN ISO 9239-1
EN ISO 1182
EN 13823
EN ISO 60332-1-1 & 2 for cable

Maritime

IMO Recognition

IMO Résolution MSC 307 (88) – 2012 FTP code :

- Part 1 : EN ISO 1182,
- Part 2 : EN ISO 5659-2 + dynamic analyze of degradation product using IRTF,
- Part 5 : EN ISO 5658-2 : Surface flammability test,
- Part 6 : EN ISO 5658-2 : Test for primary deck covering,
- Part 10 -Appendix : EN ISO 5660.

STANAG 46

- AFAP 1 : LOI ISO 4589-2 and ISO 1716,
- AFAP 2: ISO 5659-2 Ds10 ; Dm,
- AFAP 3: NF X 70-100 @ 350 & 800 °C, Including Acrolein, formaldehyde (350 °C), and phenol 800 °C
- AFAP 4; ISO 5658 Critical flux at extinction & Heat release measurement,
- AFAP 5 : ISO 5660 Heat release measurement.

Bus

R118 Regulation
EN ISO 5658
Annex 6: *EN ISO 3795*

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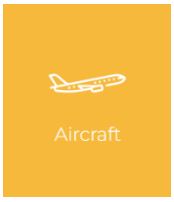
Annex 7: *NF P 92-505*
Annex 8: *EN ISO 6941*
Annexe 9: *Material to Repel Fuel or Lubricant Capacity Tester*
Resistance to flame propagation test (ISO 6722)

Cars

NF ISO 3795/ FMVSS302
D 45 1333 : PSA /Renault
NF EN 60695-2-1-10/11

Aviation FAR /JAR 25



Category	*Part 25 appendix F*	*Airbus ABD 00031*	*Boeing Safety Standards*
Ignitatbility test – 60 s with a vertical burner –	*Part I (b)(4)*	*AITM 2.0002B*	*BSS 7230 F1*
Ignitability test – 12 s with a vertical burner –	*Part I (b)(4)*	*AITM 2.0002A*	*BSS 7230 F2*
Propagation test – Speed < 64 mm/min (2,5 inches/min)	*Part I (b)(5)*	*AITM 2.0003 A*	*BSS 7230 F3*
Propagation test – Speed < 102 mm/min (4 inches/min)	*Part I (b)(5)*	*AITM 2.0003 A*	*BSS 7230 F4*
Ignitability test – 30 s with a burner at 45°	*Part I (b)(6)*	*AITM 2.0004*	*BSS 7230 F5*
Ignitability test - 30 s with a burner at 60°	*Part I (b)(7)*	*AITM 2.0005*	*BSS 7230 F6*
Smoke opacity	*Part V*	*AITM 2.0007 A* *AITM 2.0007 B* *AITM 2.0008*	*BSS 7238*
Smoke toxicity		*AITM 3.0005*	*BSS 7239*
Seat cushion	*Part II*	*AITM 2.0009*	*BSS 7303*
Cargo liner	*Part III*	*AITM 2.0010*	*BSS 7323*
Heat release	*Part IV*	*AITM 2.0006*	*BSS 7322*
Insulation (flame propagation)	*Part VI 25 856 e*	*AITM 2.0053*	*BSS 7365*
Insulation (burn through)	*Part VII 25856 b*	*AITM 2.0056*	*BSS 7387*

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Electric and electrotechnics equipments

NF EN 60695-2-10/11/12 GWFI and GWIT
NF EN 60695-11-10/ UL94

Upholstery

NF EN 45545-2: Annexes A and B
NF D 60- 013 –AM18 French regulation

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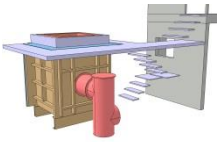
Fire resistance testing methods

Bruay Buissière

1x1 m Fire Resistancy furnace : vertical and horizontal specimen holder



Marly site NEW SUBSIDIARIES !!!

1.5 x1.5 m Fire Resistancy furnace : vertical and horizontal specimen holder , HC curve
3 x 3 m Fire Resistancy furnace : vertical and horizontal specimen holder

STANDARDS	DESCRIPTION
EN 45545-3	Railway applications. Fire protection on railway vehicles. Fire resistance requirements for fire barriers
FPT code part 3	Testing of Vertical and Horizontal Divisions, Classes A, B and F
FTP code part 4	Testing of fire door control systems
FTP Code part 11	Fire partition wall for high speed vessel
EN 1143/1047 – 1	Dual high security fireproof cabinet 110 Flame resistance 120 minutes Protection documents and / or papers
EN 1363-1 (00)	Fire resistance tests - Part 1: General Requirements
EN 1363-2 (00)	Fire resistance tests - Part 2: Alternative and additional procedures
EN 1364-2 (00)	Fire resistance tests for non-loadbearing elements. Part 2: ceilings.
EN 1365-3 (00)	Fire resistance tests for loadbearing elements. Part 3: beams.
EN 1365-4 (00)	Fire resistance tests for loadbearing elements. Part 4: columns.
EN 1366-1 (00)	Fire resistance tests for service installations. Part 1: ducts.
EN 1366-2 (00)	Fire resistance tests for service installations. Part 2: fire dampers.
EN 1634-1 (00)	Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 1: Fire resistance tests for doors, shutters and openable windows

None fully upgraded, feel free to contact us for any other information

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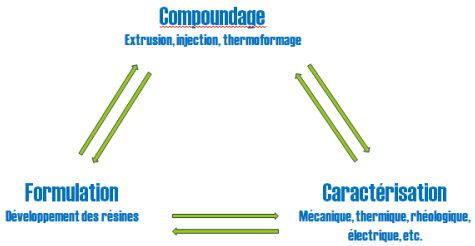
Development division

"Fast screening compounding" platform

CREPIM is fully equipped with plastic processing tools which are dedicated to all types of thermoplastics (PP, PA, PC, PS, EPDM / PP ...), allowing the development team to design and implement independently fire retardant formulations. Thanks to this fully integrated approach, we have the freedom of choice of additives and processing tools.



First, all the necessary tools for measuring thermal stability are available at CREPIM, so we are able to check if **processing is compatible** with the considered resin and additives.

Second, our **reactive processing and evaluation** hub allows us, via small-scale extrusion and injection, to confront the retained solution without having to embark on a costly and time-consuming transformation campaigns.

Among these devices, you can select:

- **Rapid Processing :**
  - Twin screw µ-extruder
  - µ-injection molding 16 Bars

  … Please contact us to check the available molds

- **Rapid Assessment:**
  - Melt Flow Index
  - Thermo Gravimetric Analysis (degradation temperature)
  - DCS analysis (Melting point / glass transition temperature)
  - Thermo-mechanical analysis (Rheometer)
  - Mechanical properties (Tensile, Compression, Three points Bending)

Finally, the semi-industrial equipment of CREPIM can achieve your **validation and your pre-industrialisation** studies to maximise and conjugate productivity and performance. Among these devices, you can select:

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- **Production of Pellets :**
  - Master batch – Dilution - Formulation
    - Twin screw Extruder
    - Single screw Extruder

- **Production of formed plastic bars:**
  - Single layer strip Extrusion 100*1.5mm
  - Bilayer A/B strip Co-extrusion de 60*1.8mm

- **Production of specimen :**
  - Manual thermoforming press
  - 2500 Bars injection molding press
  - Please contact us to check the available molds

- Mechanical properties assessment
- Visco-elasticity assessment
- Thermoforming

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Training division

Training is essential to follow developments. As the increasing use of plastics in most major sectors leads to a significant increase in risks of fires that humanly and economically often have dramatic consequences.
In addition, statistical data on fire show that cases of mortality are mainly due to the inhalation of toxic smokes. The need to develop flame retardant polymers, which do not release toxic and opaque smoke, is therefore a key objective.

This need has become more pressing since regulations tend towards greater security and seriously limit the use of many materials. This therefore requires a technology monitoring. The approach seems complicated, but CREPIM has developed a full training service from upstream - formulation of plastics - far downstream - evolutions of tests and regulations.

Summary of themes:

- **Fireproofing strategies applied to different kinds of materials**:
- Materials - eg synthetic polymers (polypropylene, polyamide, polyester unsaturated ...), natural polymers (wool, wood, cotton ... artificial polymer (viscose. ..)
- Composite materials from agro resources and industries...
- **Implementation processes**
- The normalisation and tests associated to the areas of E&E equipment, construction, cables, mass transport
- National and European regulations and guidelines, including those for example on construction products-CE-and the interoperability of the railways sector.

For certification, training are only focuses on generalities and cannot be focused on a case study for specific products.This list is not exhaustive and our teams are at your disposal to build a training plan focused on your needs. Company. Our training courses can be done either in groups, or one on one, whether here at CREPIM, or on your premises..

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CREPIM : 2400 m² and 20 people dedicated to your success

Contact :

Mr. Franck POUTCH, President

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