



CHARACTERISATION "PROCES-VERBAL" No. EFR-15-002724 B

Fire resistance of construction elements, as per amended Ministerial Order dated March 22, 2004 issued by the French Ministry of the Interior

Period of validity	This "procès-verbal" and any extensions are valid until 02 September 2020
Assessment of the reference laboratory	EFR-15-002724
Concerning	<p>Suspended ceiling with visible framework and mineral fibre tiles:</p> <ul style="list-style-type: none">• Framework: SAINT GOBAIN EUROCOUSTIC QUICK-LOCK CLIP-ON and QUICK-LOCK HOOK-ON• Panel: SAINT GOBAIN EUROCOUSTIC TONGA A, ALTES, ACOUSTICHOC, TONGA® ULTRA CLEAN A, ATHENA <p>Applicable beneath floors comprising:</p> <ul style="list-style-type: none">• Joist: concrete, pre-stressed concrete, steel, cold formed steel, wood• Slab: cellular concrete, pre-stressed concrete, concrete, steel-concrete composite, wood
Applicant	<p>SAINT GOBAIN EUROCOUSTIC 1 place Victor Hugo F - 92411 COURBEVOIE Cedex</p>

1 PURPOSE OF THE PROCES-VERBAL

Determination, in compliance with the procedure indicated in standard EN 13381-1 "Test methods for determining the contribution to the fire resistance of structural members: Part 1: Horizontal protective membranes" and the decree, modified on 22 March 2004, of temperatures attained in the plenum and steel joists of a standard floor with steel joists and covering of cellular concrete slabs and protected on the underside by a suspended ceiling.

2 TEST LABORATORY

EFFECTIS France
Voie Romaine
F - 57280 MAIZIERES-LES-METZ

3 TEST APPLICANT

SAINT GOBAIN EUROCOUSTIC
Les Renardières - Bâtiment A Ilot Alsace
1 place Victor Hugo
F - 92411 COURBEVOIE Cedex

4 REFERENCE DOCUMENT

Document number	Document date
Laboratory assessment EFR-15-002724	02 September 2015

5 REFERENCE AND SOURCE OF ELEMENT TESTED

5.1 FRAMEWORKS

Reference : QUICK-LOCK CLIP-ON and QUICK-LOCK HOOK-ON

Source : SAINT GOBAIN EUROCOUSTIC or SAINT GOBAIN PLAFOMETAL
1 place Victor Hugo Route de Phades
F - 92411 COURBEVOIE Cedex F - 08800 MONTHERME

5.2 PANELS

Reference : TONGA A Blanc, ALTES, ACOUSTICHOX Couleur, TONGA® ULTRA CLEAN A, ATHENA (th = 22 mm)

Source : SAINT GOBAIN EUROCOUSTIC
1 place Victor Hugo
F - 92411 COURBEVOIE Cedex

6 DESCRIPTION OF THE ELEMENTS

6.1 GENERAL

The element is a suspended ceiling with visible framework and mineral slabs protecting a floor such as described in section 15 of standard EN 13381-1 and in sections 8 and 9 of the present document.

6.2 SCHEDULE OF COMPONENTS

Prepared from information provided by the applicant.

Description	Reference	Material	Characteristics	Supplier
Load-bearing T-profile	QUICK-LOCK CLIP-ON	galvanized steel white pre-painted steel	24 x 38 mm l: 3600 mm th: 0.35 / 0.17 mm	SAINT GOBAIN EUROCOUSTIC
	QUICK-LOCK HOOK-ON		24 x 38 mm l: 3600 mm th: 0.35 / 0.17 mm	
"T" crosspiece 1200	QUICK-LOCK CLIP-ON	galvanized steel white pre-painted steel	24 x 32 mm l: 1200 mm th: 0.35 / 0.17 mm	SAINT GOBAIN EUROCOUSTIC
	QUICK-LOCK HOOK-ON		24 x 32 mm l: 1200 mm th: 0.35 / 0.17 mm	
"T" crosspiece 600	QUICK-LOCK CLIP-ON	galvanized steel white pre-painted steel	24 x 25 mm l: 600 mm th: 0.35 / 0.17 mm	SAINT GOBAIN EUROCOUSTIC
	QUICK-LOCK HOOK-ON		24 x 32 mm l: 600 mm th: 0.35 / 0.17 mm	
Channel trim	87926 87933	white pre-painted steel	19 x 40 x 19 mm l: 3000 mm th: 5/10 mm	SAINT GOBAIN EUROCOUSTIC
Adjustable hanger	87559 / 87561 / 87563 / 87566	steel	Ø: 4 mm	SAINT GOBAIN EUROCOUSTIC
Self-tapping screws	VPC5	steel	Ø: 3.8 mm l: 55 mm	SAINT GOBAIN EUROCOUSTIC
Edge spring	AC 49	"spring" steel	th: 5/10 mm	SAINT GOBAIN EUROCOUSTIC
Horizontal support clip	AC 84	steel	w: 40 mm th: 1.1 mm	SAINT GOBAIN EUROCOUSTIC
Anti-lifting clip	Pin 87807 / AC 38	steel	Ø: 2.4 mm	SAINT GOBAIN EUROCOUSTIC
	EUROCLIP	steel		SAINT GOBAIN EUROCOUSTIC
	Staple 87798 / AC 254	steel		SAINT GOBAIN EUROCOUSTIC
	Clip 87805 / CA 115	steel		SAINT GOBAIN EUROCOUSTIC
Panel	TONGA A, ALTES, ACOUSTICHOC, TONGA® ULTRA CLEAN A, ATHENA	Rock wool surfaced with a decorative white or coloured coat.	595 x 595 x 22 mm ad = 2.3 kg/m ²	SAINT GOBAIN EUROCOUSTIC
Insulation	EUROLENE 603	Rock wool	1200 x 600 x 160 mm bd = 34 kg/m ³	SAINT GOBAIN EUROCOUSTIC
Supplementary insulation	IBR	Glass wool	th = 0 to 200 mm bd = 11 kg/m ³	ISOVER
Last panel fixing system	87795 / CA 120			PLAFOMETAL

l = length --- h = height --- th = Thickness --- bd = bulk density --- ad = area density

6.3 DESCRIPTION OF THE CEILING

6.3.1 Channel trim

The channel trim is attached to the inside face of the peripheral walls by self-tapping screws 3.8 x 55 mm (Ø x l) at maximum intervals of 300 mm.

6.3.2 Load-bearing framework

6.3.2.1 Load-bearing profiles

The load-bearing profiles QUICK-LOCK CLIP-ON or HOOK-ON are arranged longitudinally along the ceiling.

They are installed so as to create a plenum of at least 300 mm between the underside of the load-bearing floor and upper side of the ceiling, which may be defined as the upper face of the panels or the upper face of the insulation.

These profiles, which may comprise two elements snapped together, comprise a Fire Break for each length. The joint between two profiles is at 195 mm from the butt joint at a maximum of 1885 mm from the walls.

The profiles are in galvanized steel (core thickness = 35/100mm), pre-painted white (underside - thickness = 17/100 mm).

Load-bearing profiles are installed without any gap, i.e. butted up against the walls.

The profiles are installed so as to respect the following distances:

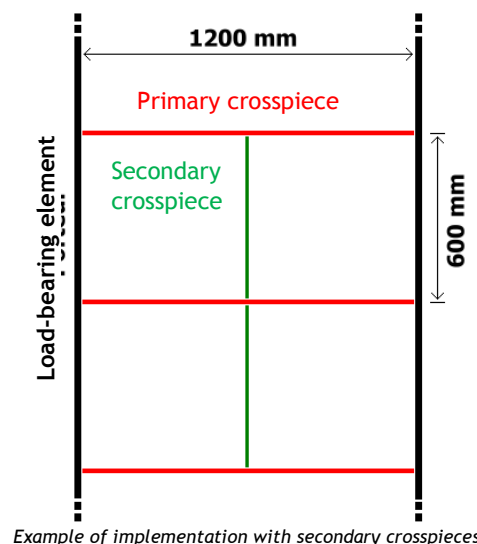
- Spacing from centre line:
 - Without secondary crosspiece: 600 mm
 - With primary crosspieces: 1200 mm
- Maximum distance between load-bearing elements and walls: 375 mm.

6.3.2.2 Crosspieces

Crosspieces are in galvanized steel (core thickness = 35/100mm), pre-painted white (underside - thickness = 17/100 mm).

Two types of crosspiece can be employed:

- Primary crosspieces, used between the load-bearing elements at 600 mm spacings;
- Secondary crosspieces, used between the primary crosspieces previously described and resting in the channel trim.



They are equipped at each end with a fixing system and are assembled into the notches formed in the load-bearing profiles and crosspieces or rest on the channel trim.

6.3.3 Hangers

Each load-bearing profile is supported by the fixing hangers. The hangers are used in order to create a plenum as defined in section 6.3.2.1.

The hangers are at intervals of:

- 900 mm with insulation on the back of the panels:
- 1200 mm without insulation on the back of the panels:

Each of these comprises:

- an adjustable hanger, two steel wire hooks Ø 4 mm;
- a horizontal support clip for IPE 160.

6.3.4 Ceiling panels

The ceiling panels are in rock wool surfaced with a decorative white or coloured coating.

Reference	Dimensions	Thickness	Area density (kg/m ²):	Edges
TONGA A ALTES ACOUSTICOC TONGA® ULTRA CLEAN A ATHENA	595 x 595	22 mm	2.3 kg/m ²	Straight

The panels are fitted inside the metal framework formed by the load-bearing elements and cross-beams.

The anti-lifting clips are fitted onto each panel as it is installed.

The last complete panel is fitted with a locking system. This comprises two sheet metal profiles enclosing the sides of the panel, connected by two flats with steel screws. The end panel is locked by sliders running on the load-bearing framework that locks together the two profiles.

6.3.5 Thermal insulation

6.3.5.1 Insulation

Rock wool panels, reference EUROLENE 603, of dimensions 1200 x 600 x 160 mm (l x w x th) and bulk density 34 kg/m³ (5.44 kg/m²), can be installed on the back of the panels. They are installed one against the other with no gaps.

Supplementary glass fibre insulation IBR (ISOVER), of maximum thickness 200 mm and bulk density 11 kg/m³ (2.2 kg/m² maximum) can be implemented over the rock wool insulation. The glass fibre can be bare or covered with an aluminium vapour barrier.

6.4 NON-REMOVABILITY

Non-removability tests were performed in accordance with the Application Protocol of the old Ministry of the Interior decree of 3 August 1999 on the ceiling panels in the central part and on the last ceiling panel as indicated in the reference document.

Following these conclusive tests, the ceiling was considered non-removable.

7 REPRESENTATIVE NATURE OF ELEMENTS

The sample tested is considered representative of the applicant's current standard manufacture.

The conditions to be respected for installation are described in this "procès-verbal", and comply with those observed during installation for the test.

8 CONCLUSIONS

These classifications were produced in accordance with section 7.4.6.2. of NF EN 13501-2, and the report of CECMI dated 6 December 2005.

The element was classified using the following combinations of parameters and ratings.

No other classification is permitted.

8.1 WITH EUROLENE ROCK WOOL

Construction material of beams and girders	Construction material of floor support	Reference temperatures (°C)		Fixed periods to attain reference temperatures (min)		Classifications	
		In the plenum	In the load-bearing structures	In the plenum	In the load-bearing structures	R	REI
Pre-stressed concrete	Cellular concrete	450	-	140	-	120*	120*
	Pre-stressed concrete	450	-	140	-	120*	120*
	Concrete	450	-	140	-	120*	120*
	Mixed steel/concrete	400	350	120	100	90*	90*
Concrete	Cellular concrete	600	-	150	-	120*	120*
	Pre-stressed concrete	450	-	140	-	120*	120*
	Concrete	600	-	150	-	120*	120*
	Mixed steel/concrete	400	350	120	100	90*	90*
	Wood	300	-	80	-	60*	60*
Steel	Cellular concrete	530	510	150	150	120*	120*
	Pre-stressed concrete	450	-	140	-	120*	120*
	Concrete	530	510	150	150	120*	120*
	Mixed steel/concrete	400	350	120	100	90*	90*
	Wood	300	-	80	-	60*	60*
Cold formed steel	Cellular concrete	370	350	110	100	90*	90*
	Pre-stressed concrete	370	350	110	100	90*	90*
	Concrete	370	350	110	100	90*	90*
	Mixed steel/concrete	370	350	110	100	90*	90*
	Wood	300	-	80	-	60*	60*
Wood	Cellular concrete	300	-	80	-	60*	60*
	Pre-stressed concrete	300	-	80	-	60*	60*
	Concrete	300	-	80	-	60*	60*
	Mixed steel/concrete	300	-	80	-	60*	60*
	Wood	300	-	80	-	60*	60*

*: these classifications are authorised subject to the ceiling presenting good semi-natural fire resistance and that the value $\sqrt{\lambda \cdot \rho \cdot c}$ of the ceiling is less than or equal to 550 S.I. units. (at 20°C, with λ : thermal conductivity, ρ : density and c : specific heat). In the absence of justification, the classification is limited to 30 minutes.

8.2 WITHOUT EUROLENE ROCK WOOL

Construction material of beams and girders	Construction material of floor support	Reference temperatures (°C)		Fixed periods to attain reference temperatures (min)		Classifications	
		In the plenum	In the load-bearing structures	In the plenum	In the load-bearing structures	R	REI
Pre-stressed concrete	Cellular concrete	450	-	40	-	30	30
	Pre-stressed concrete	450	-	40	-	30	30
	Concrete	450	-	40	-	30	30
	Mixed steel/concrete	400	350	40	40	30	30
Concrete	Cellular concrete	600	-	50	-	45*	45*
	Pre-stressed concrete	450	-	40	-	30	30
	Concrete	600	-	50	-	45*	45*
	Mixed steel/concrete	400	350	40	40	30	30
	Wood	300	-	20	-	20	20
Steel	Cellular concrete	530	510	40	50	45*	45*
	Pre-stressed concrete	450	-	40	-	30	30
	Concrete	530	510	40	50	45*	45*
	Mixed steel/concrete	400	350	40	40	30	30
	Wood	300	-	20	-	20	20
Cold formed steel	Cellular concrete	370	350	30	40	30	30
	Pre-stressed concrete	370	350	30	40	30	30
	Concrete	370	350	30	40	30	30
	Mixed steel/concrete	370	350	30	40	30	30
	Wood	300	-	20	-	20	20
Wood	Cellular concrete	300	-	20	-	20	20
	Pre-stressed concrete	300	-	20	-	20	20
	Concrete	300	-	20	-	20	20
	Mixed steel/concrete	300	-	20	-	20	20
	Wood	300	-	20	-	20	20

*: these classifications are authorised subject to the ceiling presenting good semi-natural fire resistance and that the value $\sqrt{\lambda \cdot \rho \cdot c}$ of the ceiling is less than or equal to 550 S.I. units. (at 20°C, with λ : thermal conductivity, ρ : density and c : specific heat). In the absence of justification, the classification is limited to 30 minutes.

9 FIRE RESISTANCE CLASSIFICATION VALIDITY CONDITIONS

9.1 DURING MANUFACTURE AND IN IMPLEMENTATION

The element and its assembly must conform to the detailed description appearing in the reference laboratory assessment, excluding:

- any contact between the upper faces of the installed slabs with structural or flammable elements;
- the presence of accessories lying on or suspended beneath the suspended ceiling;
- a mean height of the plenum less than 300 mm.

In the event of dispute regarding an element forming the subject of this "procès-verbal", the laboratory assessment may be requested from its owner, with no obligation to transfer the document.

9.2 DIRECTION OF FIRE

Fire **BENEATH** the suspended ceiling.

10 SCOPE OF VALIDITY OF "PROCÈS-VERBAL"

10.1 TYPES OF SUPPORT STRUCTURES PERMITTED

When the operating procedure described in the test method EN 13381-1 is performed on a standardised construction conforming to section 6.4.2 of standard EN 13381-1, the results obtained can be applied to horizontal structural elements conforming to combinations indicated in § 8 of the present "procès-verbal" and to the following prescriptions:

- Type of joist/beam:
 - Concrete
 - Pre-stressed concrete
 - Steel
 - Cold formed steel
 - Wood
- Type of floor:
 - Cellular concrete
 - Pre-stressed concrete
 - Concrete
 - Steel-concrete composite
 - Wood.

10.2 TYPES OF CONCRETE

In accordance with § 15.2 of the standard EN 13381-1, the performances indicated in § 8 of this "procès-verbal" are applicable to horizontal structural elements employing slab floors of:

- Cellular concrete of thickness greater than or equal to 125 mm and bulk density greater than or equal to 650 kg/m³;
- Normal concrete of thickness greater than or equal to 60 mm and bulk density greater than 2350 ± 150 kg/m³.

The authorised application concerning the plenum, according to section 10.6 of this "procès-verbal", must be possible in both cases.

10.3 TYPES OF STEEL BEAMS/JOISTS

In accordance with § 15.3 of the standard EN 13381-1, the performances indicated in § 8 of this "procès-verbal" are applicable to horizontal structural elements employing steel beams or joists

- irrespective of their section factor when the fire resistance is limited by the temperature measurement of the plenum;
- having a section factor less than $275 \pm 25 \text{ m}^{-1}$ when the fire resistance is limited by the temperature measurement of the surface of the lower flange of the steel beam employed during the test.

It must be possible in both cases to achieve the requirements of the authorised application with respect to the plenum, as per section 10.6 of this "procès-verbal".

10.4 TYPES OF MIXED FLOORS, CONCRETE WITH STEEL TROUGH DECKING

In accordance with § 15.4 of the standard EN 13381-1, the performances indicated in § 8 of the present "procès-verbal" are applicable to horizontal structural elements employing:

- steel beams and joists having a section factor less than 268.7 m^{-1} ;
- concrete floors incorporating steel trough decking having:
 - a thickness of concrete above the tops of the steel trough decking greater than 60 mm;
 - concrete having bulk density of at least 2350 kg/m^3 ;
 - concrete with a minimum resistance class of C25/30;
 - steel trough decking with thickness of at least 75/100 mm.

It must be possible to achieve the requirements of the authorised application with respect to the plenum, as per section 10.6 of this "procès-verbal".

10.5 TYPES OF WOODEN STRUCTURES

In accordance with § 15.5 of the standard EN 13381-1, the performances indicated in § 8 of the present "procès-verbal" are applicable to horizontal structural elements in wood, having:

- Thicknesses of particleboard /wood covering, greater than or equal to 21 mm;
- Particleboards installed perpendicularly to the joists assembled together by tongue and groove.
- Butted assemblies of panels located only above the joists.

The requirements of EN 1995-1-1 must also be satisfied.

It must be possible to achieve the requirements of the authorised application with respect to the plenum, as per section 10.6 of this "procès-verbal".

10.6 HEIGHT OF PLENUM

In accordance with § 15.6 of the standard EN 13381-1, the performances indicated in § 8 of this "procès-verbal" are applicable to horizontal structural elements protected by the same suspended ceiling as that described in this document but with a higher plenum height, i.e. a minimum of 300 mm.

10.7 PROPERTIES OF THE HORIZONTAL PROTECTIVE MEMBRANE

In accordance with § 15.8 of the standard EN 13381-1, the performances stated in § 8 of this "procès-verbal" and obtained using the suspended ceiling described in this document, are only valid for any other ceiling of the type having the same properties (same bulk density and same thickness $\pm 5\%$) and same framework components.

10.8 DIMENSIONS OF SUSPENDED CEILING TILES

In accordance with § 15.9 of the standard EN 13381-1, the performances indicated in § 8 of this "procès-verbal" are only valid for ceiling panels having identical dimensions to those described in this document.

10.9 ACCESSORIES AND FITTINGS

In accordance with §15.10 of the standard EN 13381-1, the performance indicated in § 8 of this "procès-verbal" and obtained on the ceiling tested without accessories or equipment are not applicable to suspended ceilings implemented with accessories and equipment which could influence their fire resistance performances.

An additional test including these accessories and fittings must be conducted.

10.10 FREE SPACE BETWEEN CEILING FRAMEWORK AND SURROUNDING WALLS

In accordance with §15.11 of the standard EN 13381-1, the performance indicated in § 8 of this "procès-verbal" and obtained on a suspended ceiling installed with no gaps between its framework and the surrounding walls of the test assembly, are transposable to in situ installations where such gaps are implemented, provided these do not exceed 5 mm.

11 VALIDITY PERIOD FOR FIRE RESISTANCE CLASSIFICATIONS

This "procès-verbal" is valid for FIVE years as of the date of delivery, i.e. until:

THE SECOND OF SEPTEMBER, TWO THOUSAND AND TWENTY

After this date, this "procès-verbal" is no longer valid unless it is accompanied by a re-issue supplied by EFECTIS France.

Maizières-lès-Metz, 02 September 2015



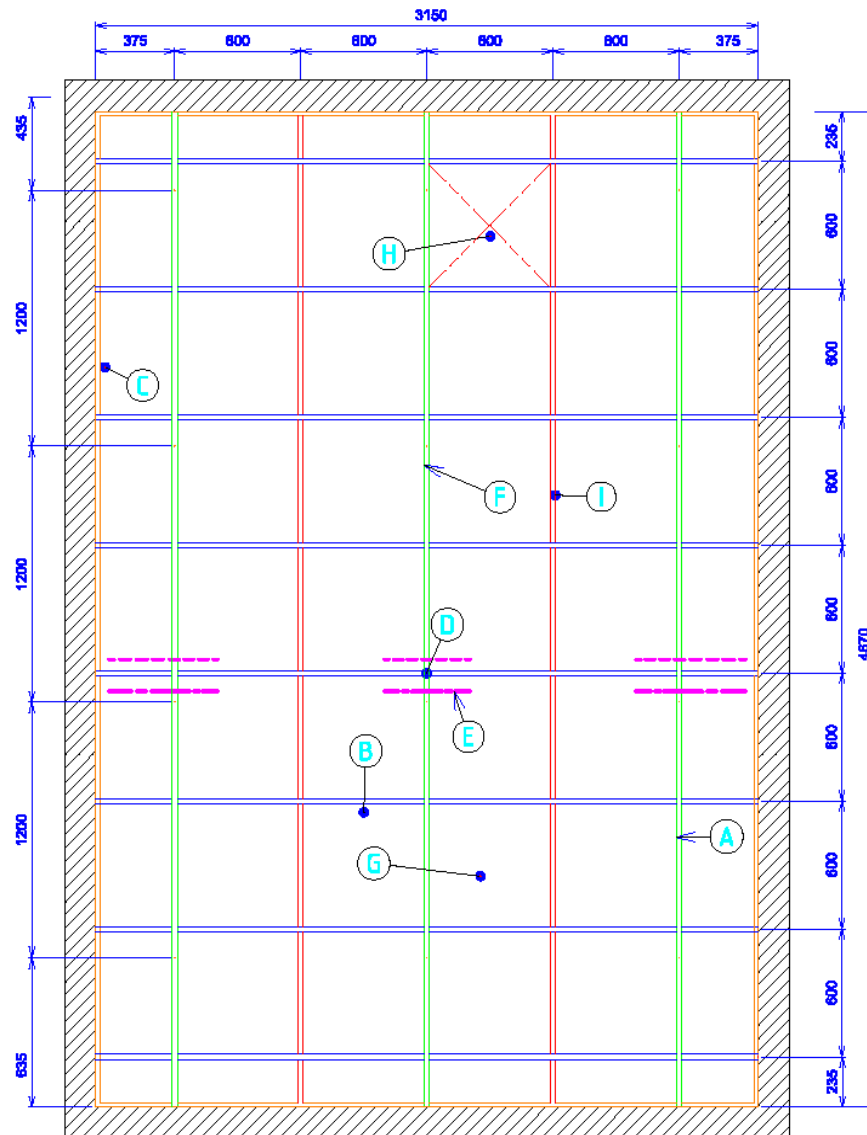
Alain DORKEL
Engineer Project Leader



Renaud SCHILLINGER
Head of Testing Department

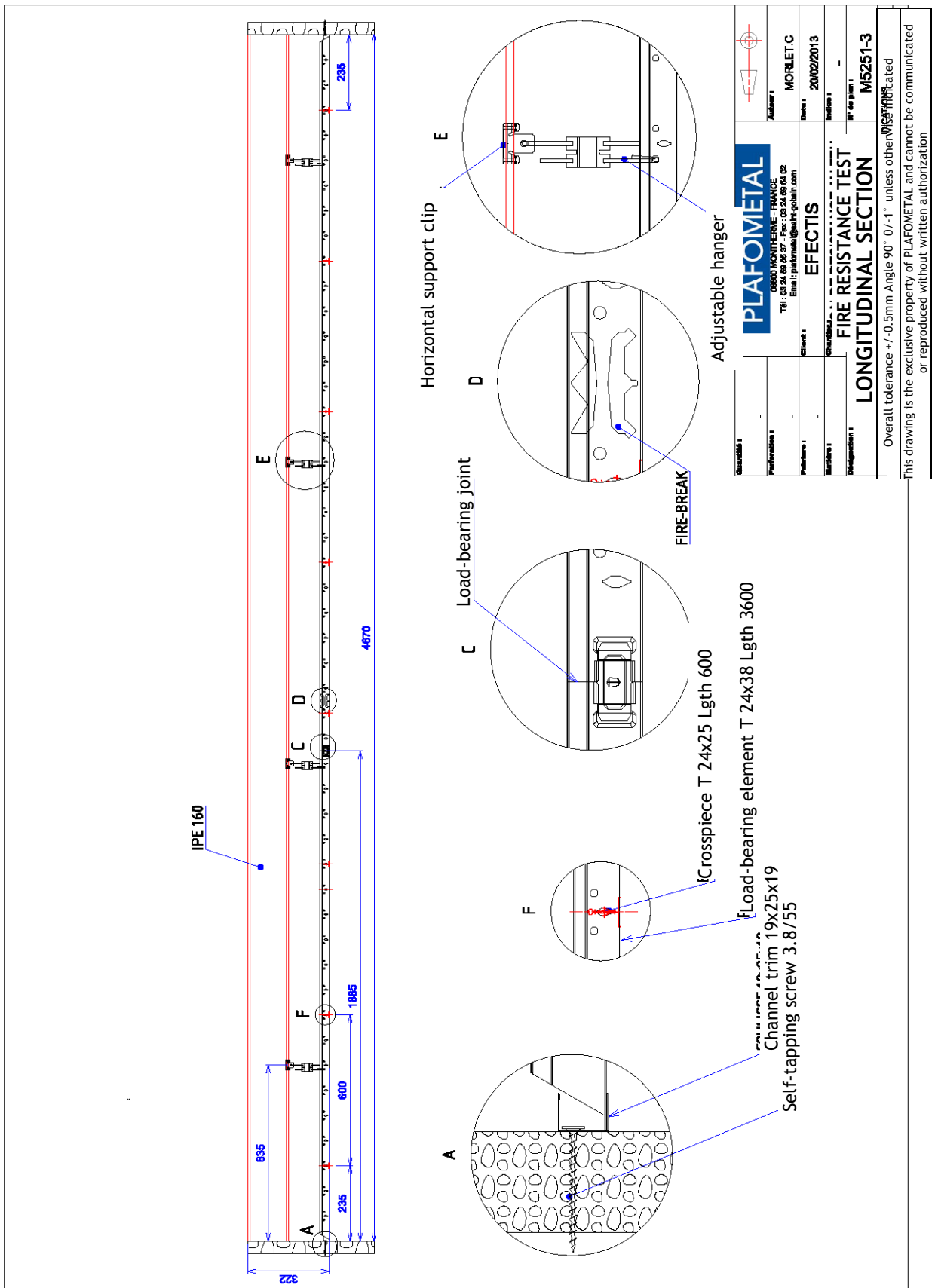
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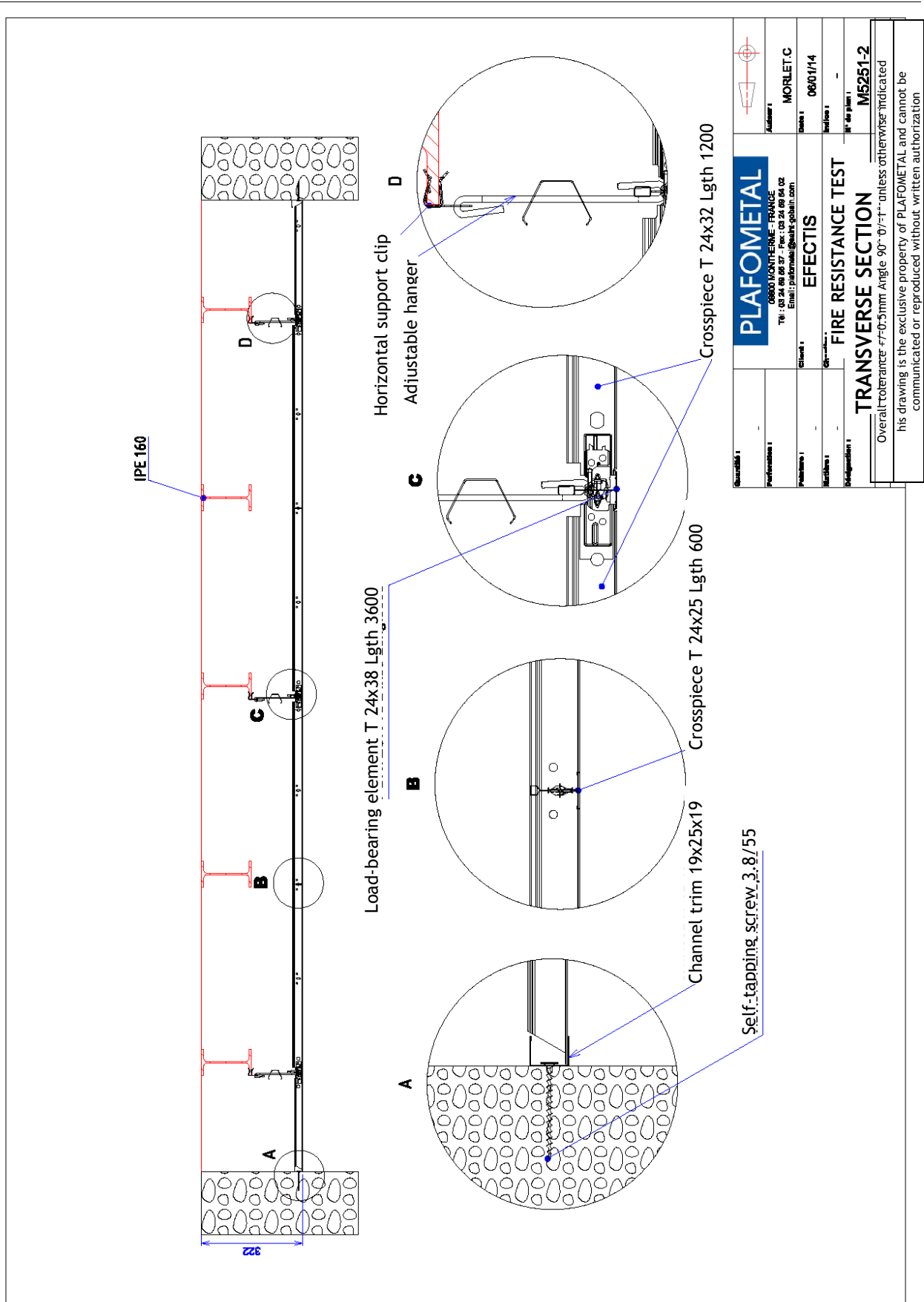
ILLUSTRATIONS APPENDIX



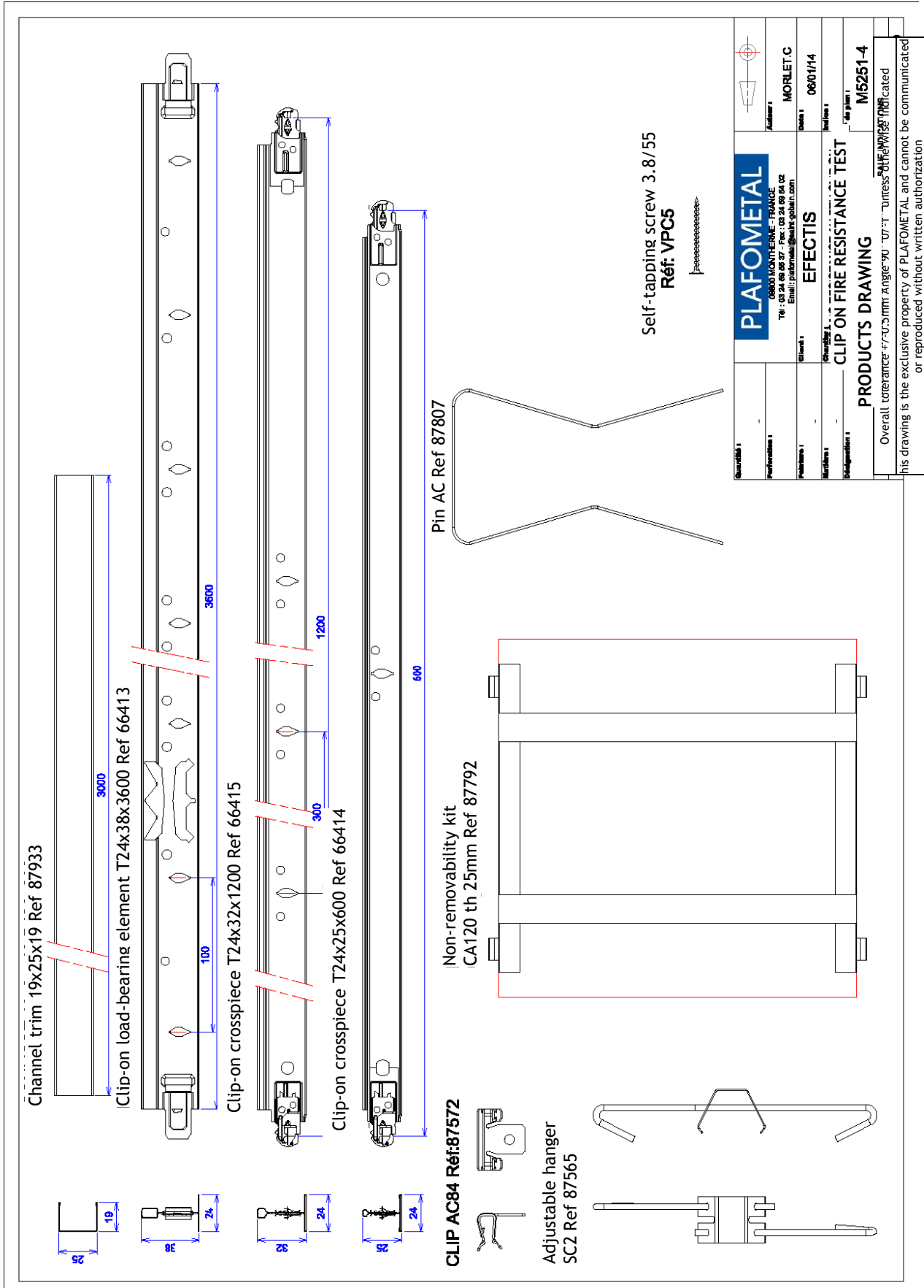
- A: Load-bearing profile
- B: Crosspiece length 1200
- C: Channel trim
- D: Fire-break
- E: Load-bearing butt-joint
- F: Suspension point on IPE
- G: Panel
- H: Last panel
- I: Crosspiece length 600

Quantité :	-	PLAFOMETAL 06900 MONTHERME - FRANCE Tél : 03 24 59 55 37 - Fax : 03 24 59 54 02 Email : plafometal@saint-gobain.com	
Perforation :	-		
Polarité :	-	Client :	Artisan :
Matériau :	-	EFFECTIS	
Modélisation :	-	FIRE RESISTANCE TEST	
LAYOUT		N° de plan : M5251-1	
Overall tolerance +/-0.5mm Angle 90° 0/-1° unless otherwise indicated			
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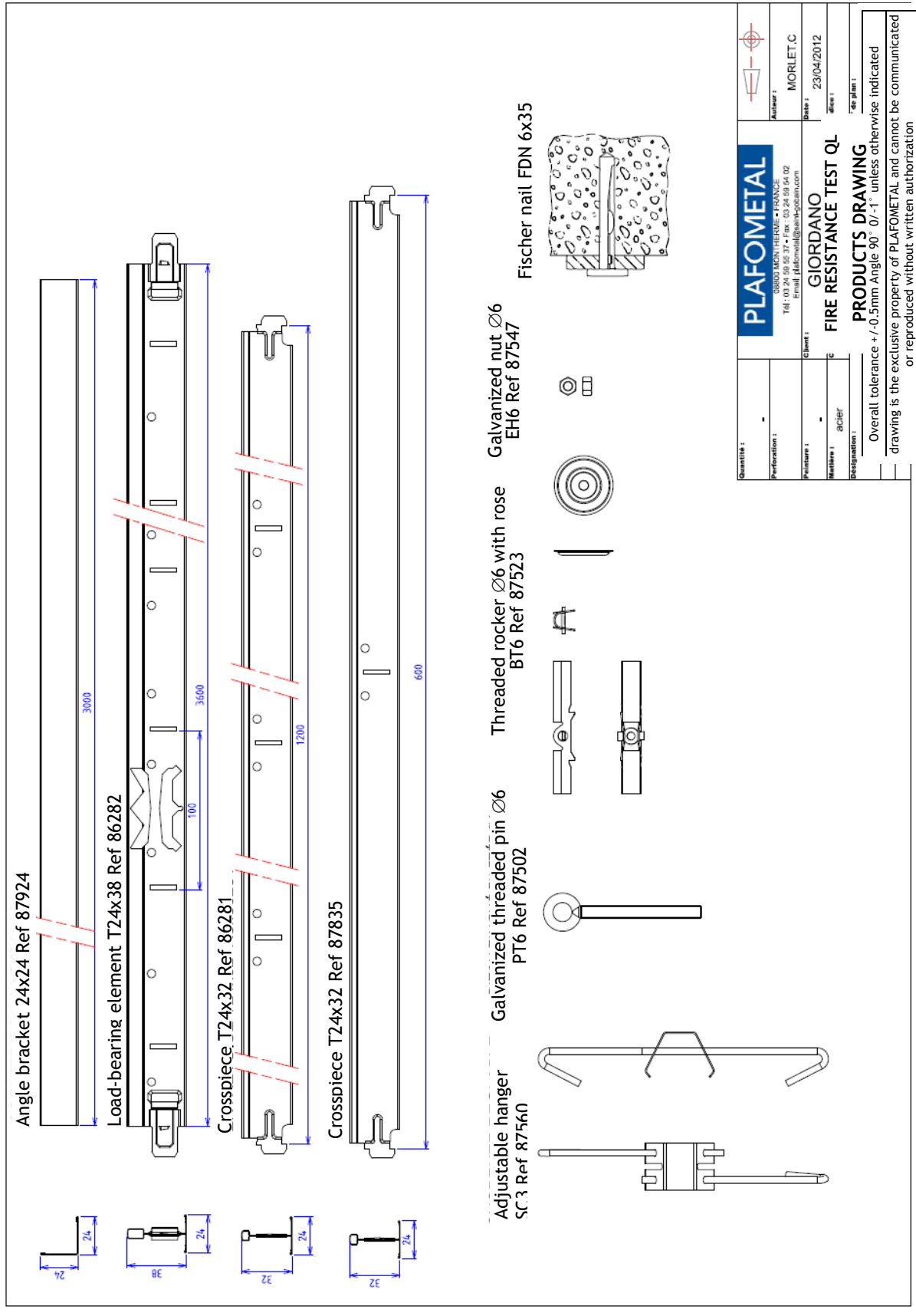
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FIRE RESISTANCE TEST		M5251-2	
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Overall tolerance +/-0.5mm Angle: 90° DT: Unless otherwise indicated

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Matériau :	acier	FIRE RESISTANCE TEST QL		
Désignation :		PRODUCTS DRAWING		
Overall tolerance +/- 0.5mm Angle 90° 0' / -1° unless otherwise indicated				
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