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FIRE TEST REPORT No. EFR-20-V-000271-A

According to EN 1363-1 : 2020 and EN 1634-1 : 2014 + A1 : 2018

Test EFR-20-V-000271-A

Performed on 17th August 2020

Regarding A composite single leaf mounted into an aerated concrete supporting construction.
Reference : MK2
Fire direction : fire on opening side and fire on opposite to opening side
Dimensions of doorsets:

- overall dimensions : 848 x 1,886 mm (W x H)
- free opening : 704 x 1,759 mm (W x H)
- leaf : 736 x 1,784 x 48 mm (W x H x TH)

Sponsor ENDURANCE DOORS
ATHERTON WAY
UK – DN 20 8AR BRIGG

REVISIONS

Rev. Index..	Modification	Comments
0	Initial document	-

1. SCOPE OF THIS TEST REPORT

Fire resistance test regarding a composite single leaf according to the general requirements of the standard EN 1363-1: 2020 and to the specific requirements of the standard EN 1634-1 + A1 : 2018 "Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows".

2. TEST LABORATORY

EFFECTIS FRANCE
VOIE ROMAINE
F-57280 MAIZIERES-LES-METZ

3. REFERENCE AND MANUFACTURER OF THE TESTED SPECIMENS

Reference : MK2
Manufacturer : ENDURANCE DOORS
ATHERTON WAY
UK – DN 20 8AR BRIGG

4. FURTHER INFORMATIONS FOR CE MARKING

(Chapter not covered under the COFRAC's accreditation).

The tested elements have not been collected.

5. DESCRIPTION OF THE TESTED SPECIMENS

The information below were provided by the applicant who attests their accuracy.

5.1. GENERAL

Note : The test specimens (dimensions, fire direction, supporting frame and assembling) were supplied by the Applicant to the Test Laboratory on his own initiative, in conformity with clause 12 of standard EN 1363-1: 2020.

The tested specimens were a composite single leaf, of reference MK2 mounted into an aerated concrete supporting construction supporting construction.

Dimensions of doorsets:

- overall dimensions : 848 x 1,886 mm (W x H)
- free opening : 704 x 1,759 mm (W x H)
- leaf : 736 x 1,784 x 48 mm (W x H x TH)

5.2. LIST OF THE COMPONENTS

According to the information supplied by the sponsor.
See appendix "LIST OF THE COMPONENTS".

5.3. DETAILED DESCRIPTION OF THE SPECIMENS

The drawings in the appendix "DRAWINGS" have been supplied by the Sponsor.

Note: The doorsets A and B were identical except for door closers.

5.3.1. Doorframe

The doorframe made of extruded PVCu profiles from the S706 (REHAU) series consisted in two mullions and one upper transom with an overall section of 72 x 70 mm.

The inner cavity was filled with a LVL (KERTO) insert with a section of 42 x 30 mm and a theoretical density of 410 kg/m³. It was maintained by csk steel screws Ø 4.3 x 25 mm.

These elements were mitre cut. Each mitred section of the frame were fitted with a graphite intumescent pad (STS) with dimensions of 38 x 30 x 2 mm. The base of the reinforcement to each mullion received a graphite intumescent pad (STS) with dimensions of 30 x 35mm. Each mitred section was heat welded together and assembled by two steel brackets with dimensions of 100 x 100 x 30 mm and a thickness of 1.5 mm. They were fixed by two csk steel screws Ø 4.3 x 30 mm and an additional csk steel screws Ø 5 x 50 mm. The doorframe shaped realized a rebate of dimensions 54 x 20 mm in order to receive the leaf.

A PVC sill with an overall section of 150 x 30 mm, with a filling made of a LVL (KERTO) insert with a section of 28 x 19 mm, was fixed to concrete sill by two steel screws Ø 4.3 x 40 mm located at 150 mm from each corner.

A threshold of reference MDS 70 (EXITEX) with an overall section of 76.2 x 25 mm was installed on the pvc sill. This element was assembled to the mullions by a steel screw Ø 5 x 70 mm and to the PVC sill by three steel screws Ø 4.3 x 40 mm centrally and at 50 mm from each extremity.

An adhesive intumescent graphite tape (STS) with a section of 30 x 2 mm was glued, between the doorframe and the supporting construction, centered on the mullions and the upper transom.

An adhesive intumescent graphite tape (STS) with a section of 25 x 2.5 mm was glued on the mullions and the upper transom in the rebate.

An adhesive intumescent graphite tape with a brush (STS) with a section of 15 x 2.5 mm was glued on the mullions and the upper transom in the rebate.

A weather gasket of reference QLON 7000 (SCHLEGEL) was inserted on the mullions and the upper transom at the rebate location.

An adhesive intumescent graphite tape (STS) with a section of 30 x 2.5 mm was glued on the threshold.

An adhesive intumescent graphite tape (STS) with a section of 15 x 2 mm was glued on the threshold.

The doorframe was fixed to the aerated concrete supporting construction four steels screws Ø 5 x 160 mm per mullion with maximal step of 800 mm.

The 5 mm gap between the doorframe and the supporting construction was filled by intumescent mastic of reference ST 88 (STS). No mineral wool was used.

5.3.2. Leaf

The leaf consisted in:

- a PVC facing of reference VEKAPLAN KD (VEKAPLAN) with a thickness of 1.5 mm and a theoretical density of 1,380 kg/m³ ;
- a core panel of reference LVL SOLID CORE (KERTO) with a thickness of 45 mm and a theoretical density of 410 kg/m³ ;
- a PVC facing of reference VEKAPLAN KD (VEKAPLAN) with a thickness of 1.5 mm and a theoretical density of 1,380 kg/m³ ;

Due to the moldings shapes in the facings, the core received recess filled by an adhesive intumescent graphite tape (STS) with a section of 30 x 2 mm.

The facings were fixed to the core board by polyurethane water activated glue of reference D2655 (LEESONS) applied with a thickness of 1 mm.

The leaf received, all around, PVC lippings with a section of 48 x 1.5 mm. The lippings were fixed by hotmelt glue of reference TECHNOMELT PUR (HENKEL) applied with a thickness of 1 mm.

An adhesive intumescent graphite tape of reference FO (STS) with a section of 30 x 2.5 mm was glued on top and bottom transoms in a groove with the same dimensions.

5.3.3. Hardware

5.3.3.1. Hinges

The leaf was hung by three steel hinges of reference 2837373 (WINKHAUS) with dimensions of 102 x 84 mm and a thickness of 2 mm.

The hinges were fixed on the leaf in a mortise of overall dimensions of 102 x 35 x 4 mm (L x W x D) by four steel screws Ø 4.3 x 40 mm per hinges. The hinges were fixed on the doorframe mullion by four steel screws Ø 4.3 x 40 mm per hinges which interrupted the intumescent seal.

They were located at 150 mm from the top of the leaf, 150 mm from the bottom of the leaf and at mid-distance from the two extremity hinges.

An adhesive intumescent graphite sheet (STS) with thickness of 1 mm was glued under the hinges blades.

5.3.3.2. Locking system

The leaf was equipped with a three-point (one middle latch bolt and two hooks) mortised lock of reference AV2 - 2559887 (WINKHAUS). It was fixed with a faceplate with a section of 20 x 3 mm in a mortise with the same dimensions, by twelve steel screws Ø 4.3 x 40 mm.

The primary locking box of overall dimensions 185 x 16 x 60 mm (H x W x D) was positioned in a mortise of dimensions 200 x 16.5 x 80 mm (H x W x D).

The primary latch bolt was engaged in a latch keep (WINKHAUS) and fixed to the doorframe mullion by three steel screws Ø 4.3 x 40 mm which interrupted the intumescent seal.

The upper and bottom locking boxes of overall dimensions 113 x 16 x 45 mm (H x W x D) were positioned in two mortises of dimensions 130 x 16.5 x 48 mm (H x W x D).

The two hooks were engaged in a latch keep (WINKHAUS) and fixed to the doorframe mullion by four steel screws Ø 4.3 x 40 mm which interrupted the intumescent seal.

The latch bolts were activated by a die cast zinc handle associated of reference WINDSOR INLINE (FAB&FIX).

The lock handle was placed at 890 mm from the bottom of the leaf.

The inactivated dead bolt was controlled by a European cylinder of reference AVOCET ABS DC8RP4035 (ABS).

An adhesive intumescent graphite sheet (STS) with thickness of 1 mm was glued all around the lock bodies.

5.3.3.3. Door closer

A door closer was installed on the leaf on opening side. The main body of reference TS4204 (RUTLAND) with overall dimensions of 248 x 59 x 42 mm (L x W x TH) was fixed by four steel screws M5 x 32 mm.

The sliding rail was fixed on the upper transom of the doorframe of doorset A by steel screws M4 x 32 mm.

The arm fixation plate was fixed on the upper transom of the doorframe of doorset B by steel screws M4 x 32 mm.

The door closers were active for the test.

5.3.3.4. Accessories

A door knocker of reference FF6UUBSLBC (FAB&FIX) was placed on the leaf, on opposite to opening side, at 1,345 mm from the bottom of the leaf and centered on the width. It was fixed by four steel screws Ø 4.3 x 40 mm.

A spyhole of reference SWALFSC + LINERSWALF (UAP) with dimensions of Ø 14 was placed at 1,560 mm from the bottom of the leaf and centered on the width. An adhesive intumescent graphite sheet (STS) with thickness of 1 mm was glued all around the spyhole.

A cutting, with dimensions of 264 x 46 mm (W x H) was realized at 720 mm from the bottom of the leaf in order to receive a letter plate of reference NU MAIL (FAB&FIX) with overall dimensions of 310 x 75 mm fixed by two steel screws M5 x 70 mm. The letter plate was wrapped with an intumescent graphite tape (STS) with a section of 30 x 2 mm, then fixed to leaf with a bead of low modulus silicone mastic applied to both plate sections which are then fixed through the door with propriety machine screws supplied with product. In addition to this there are four Ø 4.3 x 30 mm steel screws fixed through the letter plate and into the door core from both sides to add additional support. A letter plate shield of reference TS008 NU MAIL (FAB&FIX) was fixed by four steel screws M5 x 70 mm.

Two numerals of reference FFNUM1 BC (FAB&FIX) were fixed to the leaf by two steel screws Ø 3 x 20 mm.

A door guard (MILA) was fixed on the leaf by four steel screws Ø 3 x 20 mm and to the doorframe by three steel screws Ø 3 x 20 mm.

5.3.4. Associated supporting construction

The specimens were mounted into a 100 mm thick aerated concrete supporting frame with a density of 550 kg/m³.

5.4. VERIFICATION

The laboratory performed a detailed examination of the test item prior to testing and verified the accuracy of the information provided.

6. TEST ASSEMBLY

6.1. DEFINITION OF THE TESTED SPECIMENS

The choice and the definition of these test specimens have been carried out by the sponsor.

6.2. ASSEMBLY OF THE TESTED SPECIMENS

6.2.1. Supporting construction

The elements have been installed within an aerated supporting construction installed in a reinforced concrete frame supplied by the test Laboratory EFACTIS France.

▪ Drying duration	:	more than 28 days.
▪ Thickness of the frame	:	200 mm
▪ Opening in the frame	:	3,000 x 3,000 mm (l x h)
▪ Thickness of the aerated concrete frame	:	100 mm
▪ Opening in the aerated concrete frame	:	858 x 1,898 mm (l x h)

6.2.2. Staff

The concrete frame has been supplied and installed on the furnace by the staff of the test laboratory.

The mounting of the specimens has been done by the staff of the sponsor.

7. TEST METHOD

7.1. PRELIMINARY CONDITIONING

In conformity with the requirements stated in § 1, the weight stability of the test specimens was estimated to be reached on the day of the test.

Nota: the tests described in paragraphs 7.2 to 7.4 are not carried out under the COFRAC accreditation.

7.2. MECHANICAL PRECONDITIONING

In conformity with standard EN 16034: 2015, suitability, 'proper operation' and self-closing tests were carried out before the fire test.

7.2.1. Suitability (§ A.2.2)

The leaves were submitted to 25 opening/closing operations under normal speed.

No visible disorder was noted after this test.

7.2.2. Pre conditioning test (§ A.2.3)

The leaves incorporating no friable or little consistent material, they were not subjected to 5,000 cycles of operation with a 50 % increase over the reference velocity specified in EN 1191: 2012 prior to the fire test.

7.2.3. Self-closing test (§ A.4.1 et § A.4.2)

The test carried out according to the paragraph A.4.1 was successful.

7.3. CLEARANCE MEASUREMENTS

7.3.1. Doorset A

	Theoretical	Max measured	Average
▪ At upper transom	$4 \pm 1,0$ mm	5.5 mm	4.5 mm
▪ On hinges side	$4 \pm 1,0$ mm	4.5 mm	4 mm
▪ On lock side	$4 \pm 1,0$ mm	5.5 mm	4.5 mm
▪ At the threshold	$6 \pm 1,0$ mm	4.5 mm	4 mm
▪ Engagement of the latch bolt	6 mm		

7.3.2. Doorset B

	Theoretical	Max measured	Average
▪ At upper transom	$4 \pm 1,0$ mm	5.5 mm	5 mm
▪ On hinges side	$4 \pm 1,0$ mm	5 mm	4.5 mm
▪ On lock side	$4 \pm 1,0$ mm	6 mm	5 mm
▪ At the threshold	$6 \pm 1,0$ mm	4.5 mm	4 mm
▪ Engagement of the latch bolt	5 mm		

7.4. HOLDING BACK FORCE MEASUREMENT

The maximum holding back force recorded according to the procedures prescribed in section 10.1.3 of standard EN 1634-1 : 2014 + A1 : 2018 was 30 N for the doorset A and 38 N for the doorset B.

7.5. FINAL ADJUSTMENT

The final adjustment was carried out according to the procedures prescribed in section 10.1.4 of standard EN 1634-1: 2014 + A1: 2018.

7.6. THERMAL PROGRAM

The temperature rise inside the furnace above the ambient temperature has been controlled according to the standard thermal program represented by the following function:

$$T = 345 \log_{10} (8t + 1) + 20$$

Where:

t = Time (min)

T = Furnace temperature at time t (°C)

7.7. FIRE SIDE

The fire test was performed fire on opening side for doorset A and fire on oppose to opening side for doorset B.

7.8. PRESSURE IN THE FURNACE

In conformity with the requirements stated in § 1, the pressure in the furnace was set at 0 Pa, at 500 mm from the bottom of the doorsets.

Due to position of the sensor, the setting was defined at 20 Pa during the test

8. MEASUREMENTS DURING THE FIRE TEST AND TEST RESULTS

The locations of the sensors are shown on appendix 'INSTRUMENTATION'
The readings, in appendix "CHARTS" are recorded on the plates mentioned hereafter.

Location		Markings	Plate
Laboratory	Ambient temperature	Tc 7	1
Furnace	Ambient temperature	Tc 1 to 6	2
	Deviation from the nominal curve		3
	Pressure	Pr 8	4
Doorset A	Temperatures at quarters and intersection of the diagonals of the leaf	Tc 9 to 13	5
	Temperatures at 25 mm from the visible limits of the leaf	Tc 18 to 21	6
	Temperatures at 100 mm from the visible limits of the leaf	Tc 14 to 17	7
	Temperatures at 50 mm and 100 mm of the door viewer	Tc 26 to 29	8
	Temperatures on the doorframe	Tc 22 to 25	9
	Deflection	Dep 55, 56 and 59 to 62	10
Doorset B	Temperatures at quarters and intersection of the diagonals of the leaf	Tc 30 to 34	11
	Temperatures at 25 mm from the visible limits of the leaf	Tc 39 to 42	12
	Temperatures at 100 mm from the visible limits of the leaf	Tc 35 to 38	13
	Temperatures at 50 mm and 100 mm of the door viewer	Tc 47 and 48	14
	Temperatures on the doorframe	Tc 43 to 46	15
	Deflection	Dep 57, 61, 63 and 64	16

9. OBSERVATIONS

9.1. BEFORE THE TEST

- Ambient temperature inside the laboratory : 26 °C.
- Specimens temperature before the test : 25 °C.

9.2. DURING THE TEST

9.2.1. Doorset A

Time (min)	Observations
0	Start of the test.
2	Smoke release from the locking system.
5	Smoke release from the threshold.
15	No particular observation.
20	Swelling of the non-exposed facing.
30	No particular observation.
32	Beginning of some opening through the leaf.
33	Sustained flaming with a duration higher than 10 seconds on the opening through the leaf.
34	End of the test.

9.2.2. Doorset B

Time (min)	Observations
0	Start of the test.
1	Smokes release from the mullions of the leaf
2	Smoke release from the letter plate
4	Smoke release from the upper transom of the leaf
15	No particular observation
17	Sporadic flaming on the mid-height of the mullion of the locking side of the leaf
20	Swelling of the non-exposed facing
28	Beginning of some opening through the leaf Sporadic flaming on the bottom of the mullion of the locking side of the leaf
30	Maximal temperature elevation of the element higher than 180°C measured by the thermocouple No. 38 located at 100 mm from the visible limits of the leaf.
31	Cotton wool pad test positive on the opening through the leaf at mid-height. Sustained flaming with a duration higher than 10 seconds on the opening through the leaf.
34	End of the test.

9.3. AFTER THE TEST AND COOL DOWN

At the end of the test, the doorsets were still burning until complete destruction. No observations were possible.

10. FIRE RESISTANCE CRITERIA

In conformity with the standards mentioned in chapter 1, the times during which the specimens meet the fire resistance criteria may be regarded as follows:

10.1.1. Doorset A

Criteria	Method of control	Duration	Cause of limits
Fire integrity	Cotton wool pad	34 minutes	End of the test
	Gap gauges	34 minutes	End of the test
	Sustained flaming	33 minutes	Sustained flaming with a duration higher than 10 seconds
Thermal insulation 1	-	33 minutes	Loss of satisfaction to one of the fire integrity criteria
Thermal insulation 2	-	33 minutes	Loss of satisfaction to one of the fire integrity criteria

10.1.2. Doorset B

Criteria	Method of control	Duration	Cause of limits
Fire integrity	Cotton wool pad	31 minutes	Cotton wool pad test positive
	Gap gauges	34 minutes	End of the test
	Sustained flaming	31 minutes	Sustained flaming with a duration higher than 10 seconds
Thermal insulation 1	-	30 minutes	Loss of satisfaction to the thermal insulation 2 criteria
Thermal insulation 2	Maximal temperature rising	30 minutes	$\Delta T_{\max} \geq 180 \text{ }^{\circ}\text{C}$ by Tc 38

11. FIELD OF DIRECT APPLICATION OF THE TEST RESULTS

The direct application field of the test results is limited to the determination of the permissible modifications of the test specimens following a successful fire resistance test. These modifications may be automatically introduced without the sponsor having to apply for any additional assessment, calculation or agreement.

Note: When extended prescriptions concerning the dimensions of the elements are considered, lower dimensions than the actual dimensions may be used for some elements of the test specimens in order to

maximize the extrapolation of the test results by modeling the interaction between the elements at the same scale.

11.1. MATERIALS AND CONSTRUCTION

11.1.1. General

Unless otherwise stated in the following text, the materials and construction of the doorset or openable window shall be the same as that tested. The number of leaves and the mode of operation (e.g. sliding, single action or double action) shall not be changed.

11.1.2. Specific restrictions on materials and construction

11.1.2.1. Timber construction

The door panel thickness and/or density may be increased provided the total increase in weight is not greater than 25%.

For timber based board products (e.g. particle board, blockboard, etc.), the composition (e.g. type of resin) shall not change from that tested. The density shall not be reduced but may be increased.

~~The cross-sectional dimensions and/or the density of the timber frames (including rebates) shall not be reduced but may be increased.~~

~~11.1.2.2. Metal construction~~

~~The dimensions of metal warp around frames may be increased to accommodate increased supporting construction thickness. The thickness of the metal may also be increased by up to 25%.~~

~~The type of metal shall not be changed from that tested.~~

~~The number of stiffening elements for uninsulated doors and the number and type of fixings of such members within the panel fabrication may be increased proportionally with the increase in size but shall not be reduced.~~

~~11.1.2.3. Glazed construction~~

~~The type of glass and the edge fixing technique, including type and number of fixings per metre of perimeter, shall not be changed from those tested.~~

~~The number of glazed apertures and each of the dimensions (width and height) of glass in each pane included within a test specimen may be:~~

- ~~decreased in proportion with size reductions or~~

~~Thus, the overall dimensions of the glass may be as follows:~~

	Minimal	Maximal
Width (mm)		
Height (mm)		

~~Thus, the overall dimensions of a circular glass may be as follows:~~

	Minimal	Maximal
Diameter (mm)		

- ~~decreased by a maximum of 25% for integrity only and/or radiation control constructions and for insulation specimen where the unexposed surface temperature for both the construction and the glazing have been maintained for the classification period or~~

~~Thus, the overall dimensions of the glass may be as follows:~~

	Minimal	Maximal
Width (mm)		
Height (mm)		

- ~~• reduced for doorsets, without restriction providing that the total area of the tested pane(s) is less than 15% of the door leaf or side/over panel area.~~

~~The number of glazed apertures and each of the dimensions of glass in each pane included within a test specimen shall not be increased.~~

~~The distance between the edge of glazing and the perimeter of the door leaf, or the distance between glazed apertures shall not be reduced from those incorporated in test specimen. Other positioning within the door can only be modified if this does not involve the removal or re-positioning of structural members relative to the glazing.~~

11.1.2.4. Decoratives finishes

11.1.2.4.1. Paint

Where the paint finish is not expected to contribute to the fire resistance of the door, alternative paints are acceptable and may be added to door leaves or frames for which unfinished test specimen was tested. ~~Where the paint finish contributes to the fire resistance of the door (e.g. intumescent paints), then no change shall be permitted.~~

11.1.2.4.2. Decorative laminate

Decorative laminates and timber veneers up to 1,5 mm thickness may be added to the faces (but not the edges) of doors that satisfy the insulation criteria (normal or supplementary procedure).

~~Decorative laminates and timber veneers applied to door leaves that do not satisfy the insulation criteria (normal or supplementary procedure) and/or those in excess of 1,5 mm thickness shall be tested as part of the test specimen. For all doorsets tested with decorative laminate faces, the only variations possible shall be within similar types and thicknesses of material (e.g. for colour, pattern, supplier).~~

11.1.3. Fixing

The number of fixings per unit length used to attach doorsets to supporting construction may be increased but shall not be decreased and the distance between fixings may be reduced but shall not be increased.

11.1.4. Building hardware

The number of hinges and dog bolts may be increased but shall not be decreased.

NOTE 1: The number of movement restrictors such as locks and latches is not covered by direct application.

~~Where a door set has been tested with a door closing device fitted, but with the retention force released in accordance with 10.1.4, the door set may be provided either with or without that closing device, i.e. where self-closing characteristics are not required.~~

NOTE 2: Interchange of building hardware is not covered by the field of direct application.

11.2. PERMISSIBLE SIZE VARIATIONS

11.2.1. General

Doorsets of sizes different from those of tested specimen is permitted within certain limitations, but the variations are dependent on product type and the length of time that the performance criteria are fulfilled.

The increase and decrease of dimensions permitted by the field of direct application are applicable to the overall size and to each door leaf, ~~each side panel and each over panel independently.~~

The limits of permitted size variation are given in Annex B of standard EN 1634-1: 2014 + A1: 2018.

~~In accordance with 12.2.2.3, the dimensions (width and height) of any glass pane cannot be increased.~~

11.2.2. Test periods

The amount of variation of size permitted is dependent on whether the classification time was just reached (Category 'A') or whether an extended time (Category 'B') in accordance with the values specified in section 13.3.2 of standard EN 1634-1: 2014 + A1: 2018.

Thus, the elements may be classified in the following classes:

11.2.2.1. Doorset A

Behaviour E is tested for:

Class A for the following fire resistance time: 30 minutes.

Class B for the following fire resistance time: 20 minutes.

Behaviour EI₂ is tested for:

Class A for the following fire resistance time: 30 minutes.

Class B for the following fire resistance time: 20 minutes.

Behaviour EI₁ is tested for:

Class A for the following fire resistance time: 30 minutes.

Class B for the following fire resistance time: 20 minutes.

11.2.2.2. Doorset B

Behaviour E is tested for:

Class A for the following fire resistance time: 30 minutes.

Class B for the following fire resistance time: 20 minutes.

Behaviour EI₂ is tested for:

Class A for the following fire resistance time: 30 minutes.

Class B for the following fire resistance time: 20 minutes.

Behaviour EI₁ is tested for:

Class A for the following fire resistance time: 30 minutes.

Class B for the following fire resistance time: 20 minutes.

11.2.3. Size variation related to product type (overall dimensions of the leaf)

	Class « A »		Class « B »	
	Minimal	Maximal	Minimal	Maximal
Width (mm)	unlimited	736	unlimited	846.4
Height (mm)	unlimited	1,784	unlimited	2,051.6
				The increase of the leaf area shall not exceed 1.57 m²

11.2.4. Other changes

For smaller doorset sizes, the relative positioning of movement restrictors (e.g. hinges and latches) shall remain the same as tested, or any change to the distances between them will be limited to the same percentage reduction as the decrease of test specimens size.

For larger doorset sizes, the following shall also apply:

- The height of the bolt above floor level shall be equal to or greater than the tested height, and such increase in height shall be at least proportional to the increase in door height;
- The distance of the top hinge from the top of door leaf shall be equal to or less than tested;
- The distance of the bottom hinge from the bottom of door leaf shall be equal to or less than tested;

- Where three hinges or distortion preventers are used, the distance between the bottom of the door leaf and center restraint shall be equal to or greater than that tested.

11.2.4.1. ~~Side and transom panels~~

~~The rules for variation to tested specimens of side and transom panel arrangements are the same as those applied generally to hinged or pivoted doorsets.~~

~~If only one side panel can be tested due to the constraints of the furnace size than providing a type 'B' overrun time has been proven, a second panel up to the same size may be added to the opposite side. Where an additional side panel is to be added to a tested single-leaf doorset then the tested panel shall be positioned on the latch side.~~

~~The addition of a second side panel is not allowed for doorsets satisfying the radiation control levels, unless they also satisfy the insulation criteria for the reasons given in 13.3.3.1.~~

11.2.4.2. Timber constructions

~~The number, size, location and orientation of any joints in the timber framing shall not be changed.~~

Where decorative timber veneers of 1,5 mm thick or greater thicknesses, or other claddings which themselves provide constructive benefits, are part of the test specimens, they shall not be substituted with alternatives of lesser thickness or strength.

11.3. PERMITTED FIRE DIRECTIONS

11.3.1. General

EN 1363-1 states that for separating elements required to be fire resisting from both sides, two test specimens shall be tested (one from each fire direction) unless the element is fully symmetrical, i. e. the construction of the doorset is identical on both sides of the centre line when viewed in plan (from above). However, in some cases, it is possible to develop rules whereby the fire resistance of an asymmetrical door assembly tested in one direction can apply when the fire exposure is from the other direction. The possibility to develop such rules increases if the consideration is limited to certain types of door assembly and on the criteria being applicable (e.g. integrity only doors).

11.3.2. Permitted fire directions

According to the EN 1634-1: 2014 + A1: 2018 standard, paragraph 13.4.2, and taking into account the nature of the fixed and opening leaves of the test specimens on the one hand, and the fire direction applied during the test on the other hand, the fire resistance behaviour specified in section 10 of this test report shall be valid for the following directions of fire:

- Fire integrity : fire on opening side and fire on opposite to opening side.
- Thermal insulation : fire on opening side and fire on opposite to opening side.

~~These fire directions shall be permissible only if the following conditions are met:~~

- ~~• Each of the door leaves are themselves of symmetrical construction with the exception of the edges (e.g. lock/loading edge and hinge edge or double rebated doors);~~
- ~~• Any restraining/supporting elements of building hardware has been included in a test to EN 1634-1: 2014 + A1: 2018 when exposed in both directions so that they will retain their function when exposed to the heat of the test;~~
- ~~• There is no change in the number of leaves or the mode of operating (e.g. sliding, swinging, single action or double action);~~
- ~~• Side, over and transom panels are fully symmetrical.~~

11.4. SUPPORTING CONSTRUCTIONS

11.4.1. General

The fire resistance of a door assembly tested in one form of standard supporting construction may or may not apply when it is mounted in other types of construction. Generally, the rigid and flexible types are not interchangeable and rules governing the direct application within each group are given in sections 13.5.2 to 13.5.4 of standard EN 1634-1: 2014 + A1: 2018. However, in some cases, it is possible for the result of a test on a particular type of door assembly tested in one form of standard supporting construction to be applicable to that door-assembly when mounted in a different type of standard supporting construction. Specific rules governing the situation for hinged and pivoted door assemblies are given in section 13.5.4 of standard EN 1634-1: 2014 + A1: 2018.

11.4.2. Permissible supporting construction

In conformity with the rules given in section 13.5 of standard EN 1634-1: 2014 + A1: 2018, the fire resistance behaviour specified in section 10 of this test report shall be valid for door-units assembled in:

- reinforced concrete slabs, with a density of at least 2,200 kg/m³ and a thickness of at least 100 mm.
- blockwork, masonry or homogenous concrete wall with an overall density at least 850 kg/m³ having a thickness of a least 100 mm.
- aerated concrete block wall with an overall density at least 550 kg/m³ having a thickness of a least 100 mm.
- ~~flexible supporting construction as described in paragraph 7.2.2.4. of standard EN 1363-1, of which the fire performance duration are at least equal to those of the doors. Those mean features are defined below:-~~

Intended fire resistance	Nominal steel stud depth [mm]			Gypsum boards type F, EN 520		Insulation: mineral wool	
	Group A	Group B	Group C	number of layers at each side	thickness of boards [mm]	thickness [mm]	density [kg/m ³]
EI 30	44-55	56-75	76-100	1	12,5	40-50	30-60
EI 60	44-55	56-75	76-100	2	12,5	40-50	30-60
EI 90	44-55	56-75	76-100	2	12,5	40-50	85-115
EI 120	62-70	71-75	76-100	2	15	60-70	85-115

- ~~associated support construction as described in paragraph XXX of this document.~~

12. WARNING

"This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in standard EN 1363-1, and where appropriate in standard EN 1363-2.

Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report."

"Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result".

The jjmois20aa

X

Project Leader

X

Test Supervisor

DRAWINGS APPENDIX: Plate No. 1 -



DRAWINGS APPENDIX: Plate No. 2 -



DRAWINGS APPENDIX: Plate No. 3 -



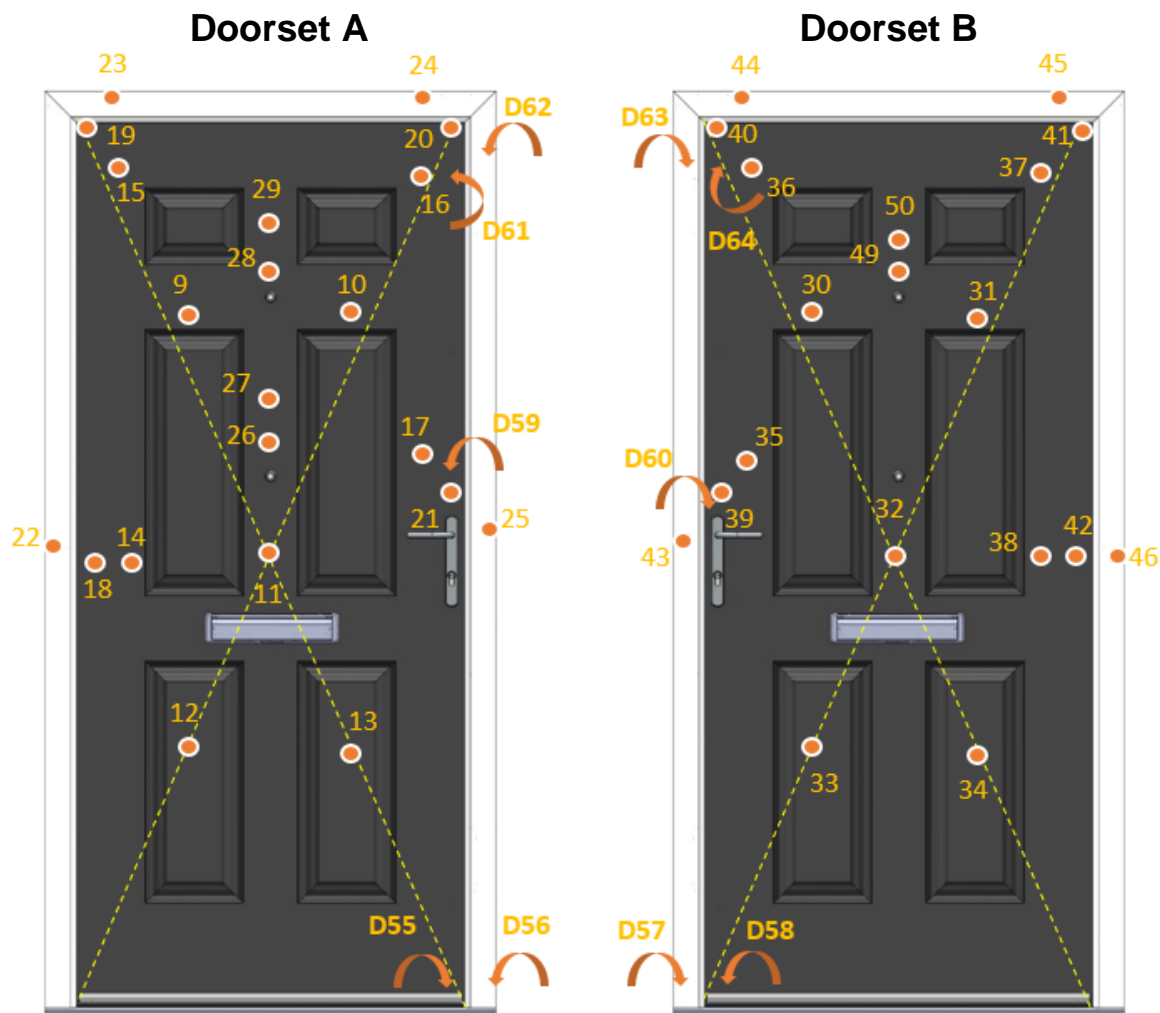
LIST OF COMPONENTS APPENDIX: Plate No. 1 -

Dimensions						
Overall frame	1886	mm high	848	mm wide	70	mm thick
Door size	1784	mm high	736	mm wide	48	mm thick
Doors to be fitted:	Dual orientation test with one door opening away from the furnace and one door opening in to the furnace					
Latch(es) to be:	engaged					
Door Leaf Construction						
		Species/type	Dimensions (mm)		Density(kg/m3)	
Brand name of blank						
Stiles	Vertical	n/a				
Rails top and bottom	Top	n/a				
	Bottom	n/a				
Sol		Kerto L Solid Core	918 x 2047 x 45		410	
Facings		PVC	918 x 2047 x 1.5			
Adhesive	Between Inner and outer stiles and rails	N/A				
	Facings	MOISTURE CURED PU	1MM			
	Lippings	HOTMELT	1MM			
Lippings to all edges		PVC	48 x 1.5			
Frame						
		Species/type	Dimensions (mm)		Density(kg/m3)	
Head		Rehau 706	72 x 52 x 70			
Jambs		Rehau 706	72 x 52 x 70			
Stops						
Head to jamb jointing detail		Welded				
Architrave						
Threshold		MDS 70 Threshold				
Frame to supporting construction fire stopping detail		Nominal 10mm fill of ST88 Intumescent mastic to each face of door set with central void filled mineral wool	Fitted fully filling the gap between door and frame to supporting wall construction - nominal 15mm gaps all round		N/A	

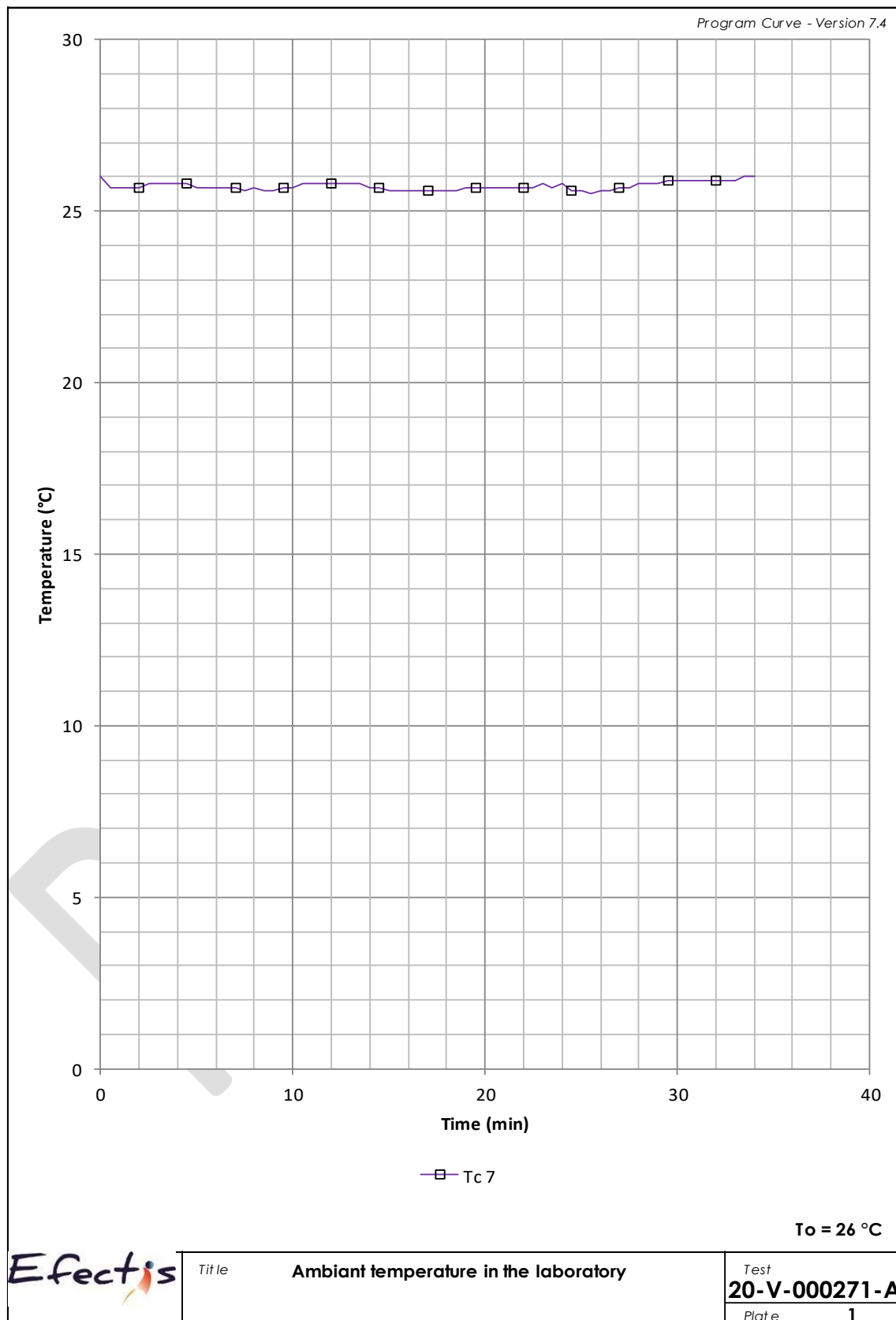
LIST OF COMPONENTS APPENDIX: Plate No. 2 -

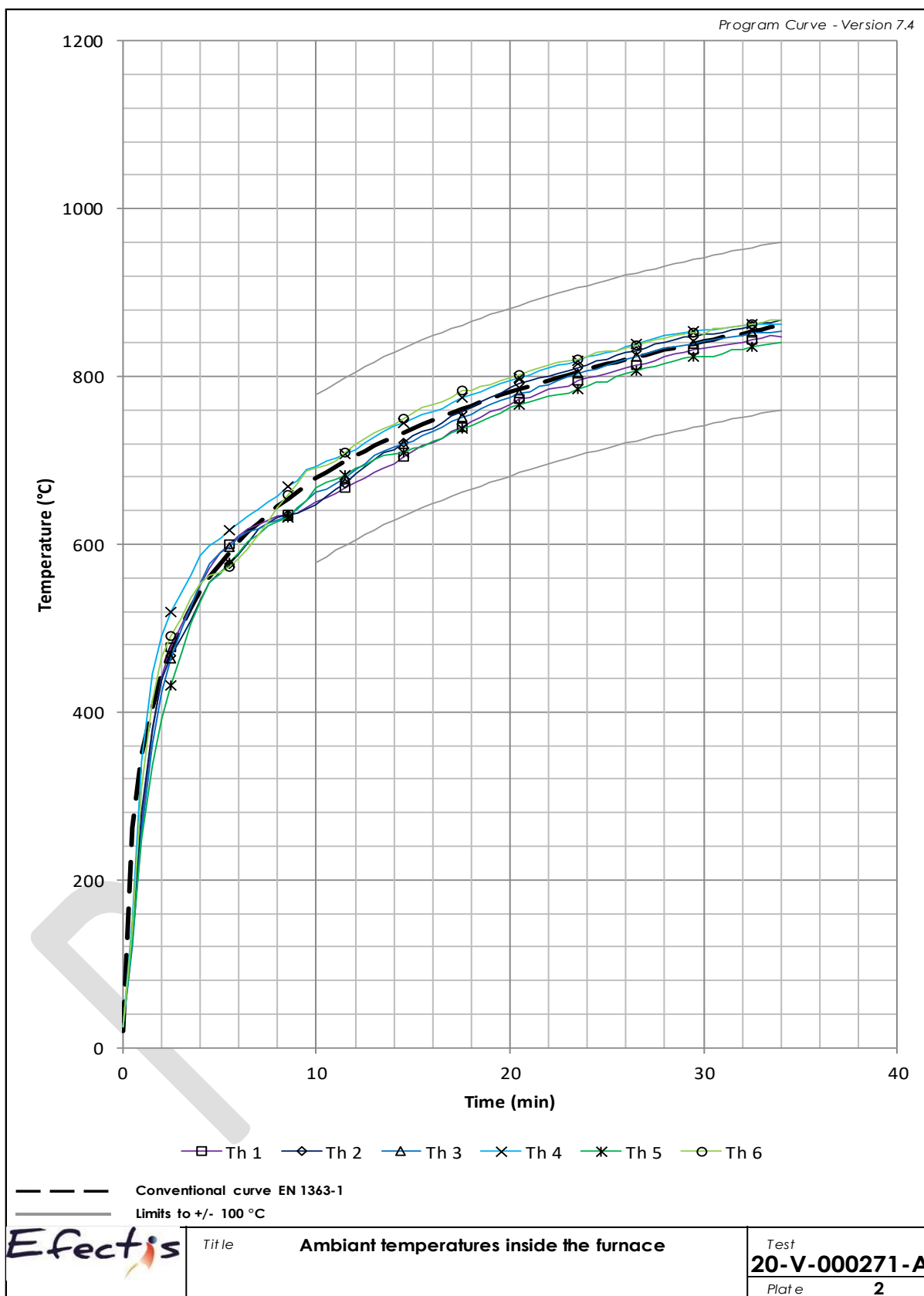
Frame to supporting construction fixing details		4No steel woodscrews per jamb with Broadfix Polypropylene plastic packers fitted to the full depth of the frame at each fixing location.	5mm Dia x 160 long fitted at 600 to 800mm centres	N/A	
Intumescent Materials					
		Present (delete as appropriate)	Species/type	Dimensions (mm)	Location
Rear of Frame	Head	Yes	Graphite	30 x 2	External Frame
	Vertical edges	Yes	Graphite	30 x 2	External Frame
Frame reveal Click blue text for links to further data	Head and JAMB	Yes	Graphite	25 x 2,5 & 15 x 2,5	Internal Frame
Door edges	Vertical meeting edge	Yes	Graphite	25 x 2,5 & 15 x 2,5	Internal Frame
Under hinge blade		Yes			
Encasing main latch body					
Under latch forend					
Under latch keeps		No			
Smoke Seal Click blue text for links to further data		Yes	Qlon	15mm	
Ironmongery					
	Manufacturer and reference number	Type and Material	Size (mm)		Location
Hinges Click manu/ref number for link to data sheet	Winkhaus 2837373	Steel Cranked hinge	102	high	150 mm from top of leaf middle and 150 from bottom of leaf
			37	wide	
			2	thick (blade size)	
Closer Click manu/ref number for link to data sheet	Rutland Slide arm closer and a rutland standard closer Ts4204				
		(footprint size)			
Latch Click manu/ref number for link to data sheet	Winkhaus 2559887	Av2 Steel	20mm faceplate		edge of leaf
Escutcheons Click manu/ref number for link to data sheet	n/a				
Cylinder Click manu/ref number for link to data sheet	ABS AVOCET 3 STAR	NICKEL	35 / 40		
Handles Click manu/ref number for link to data sheet	Fab And Fix	dia cast alloy	28 x 206		door surface

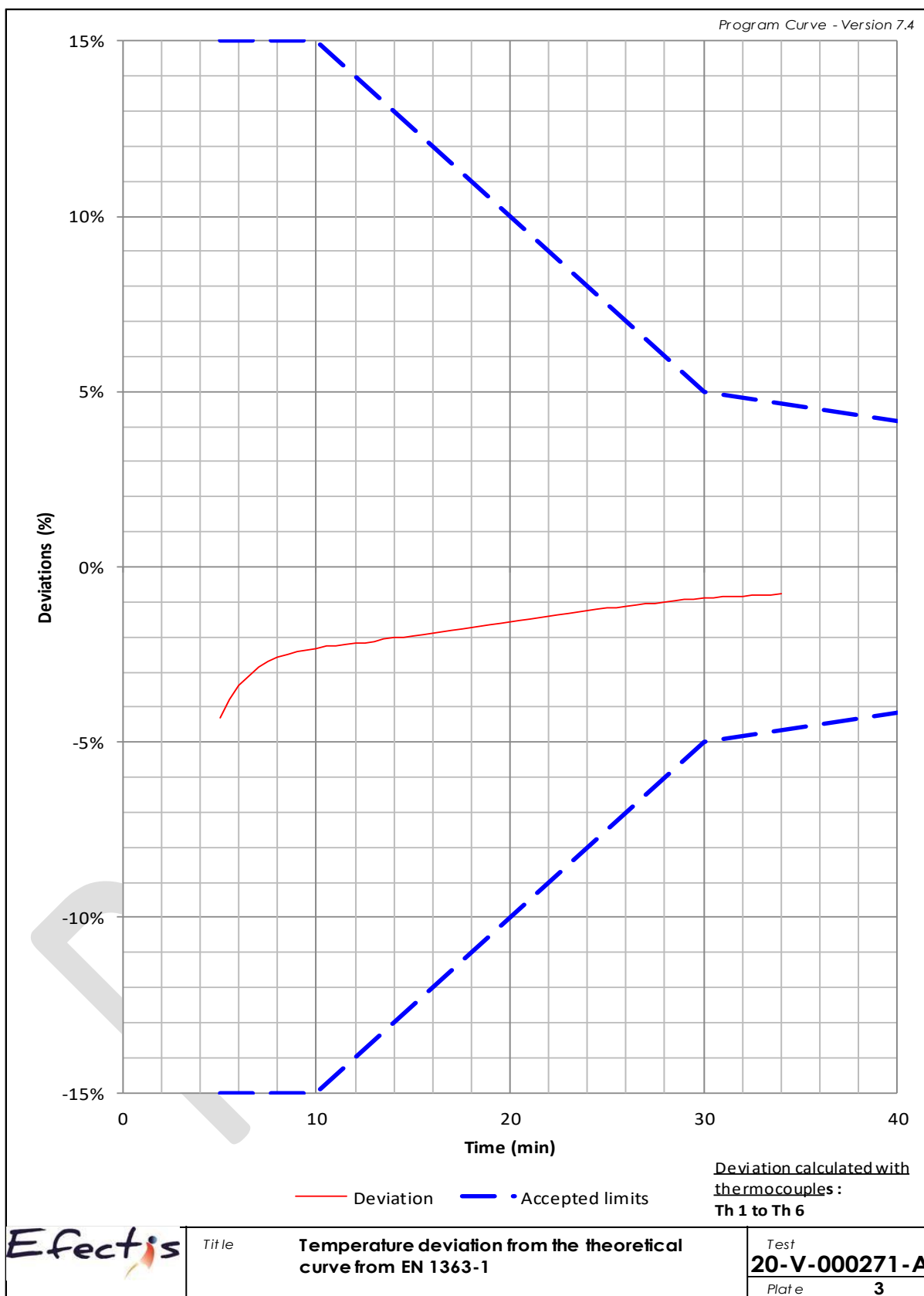
INSTRUMENTATION APPENDIX:

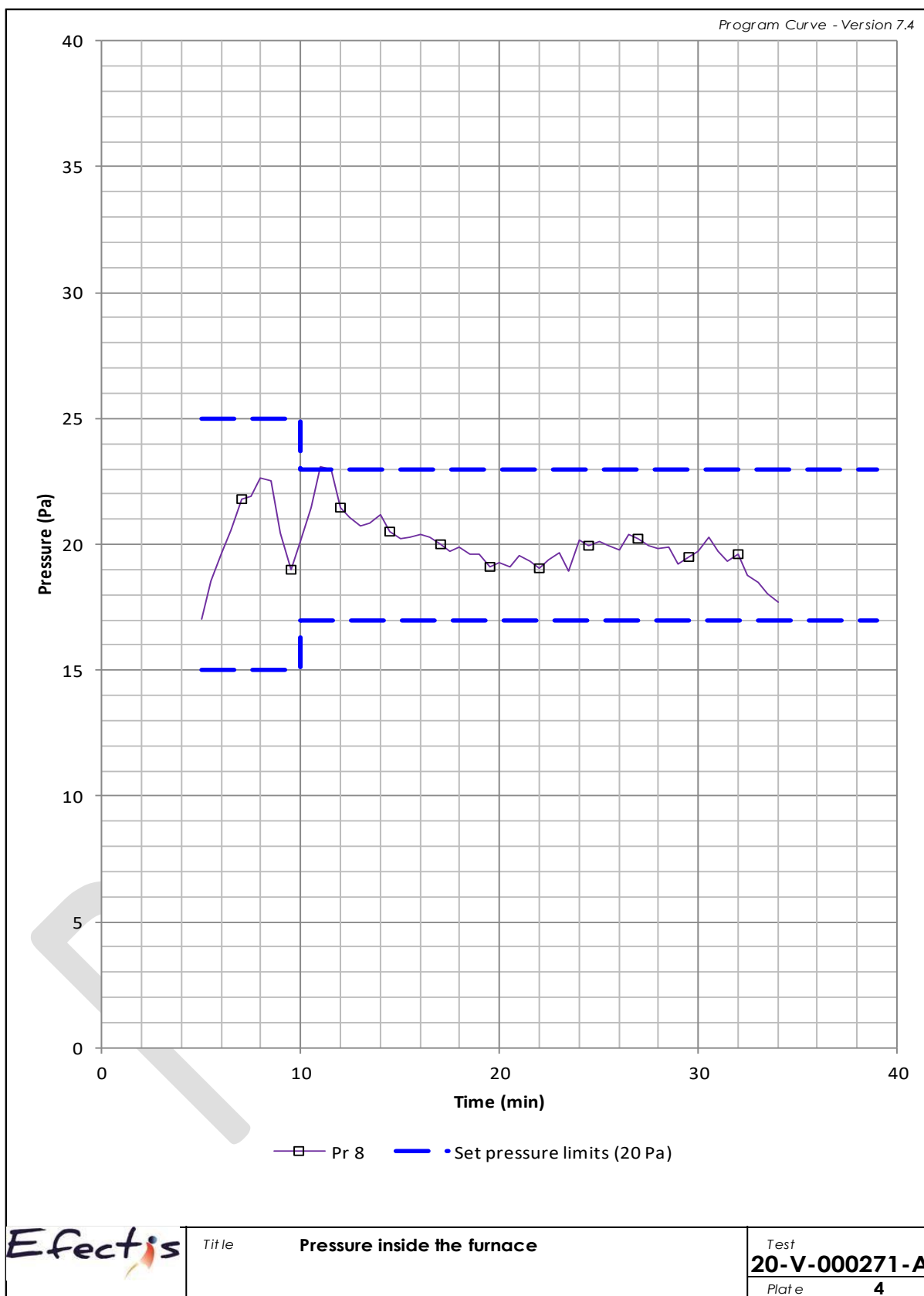


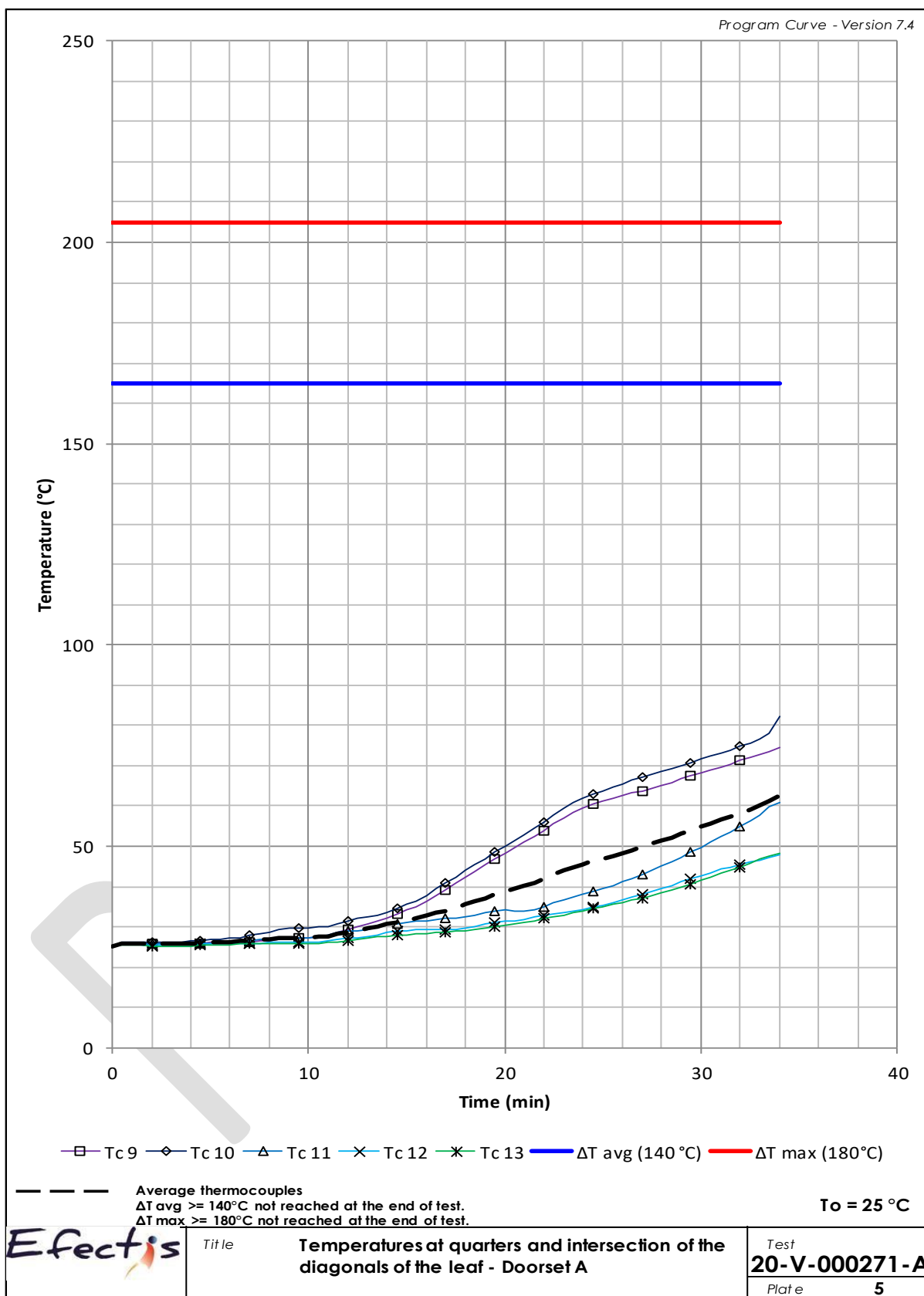
CHARTS APPENDIX

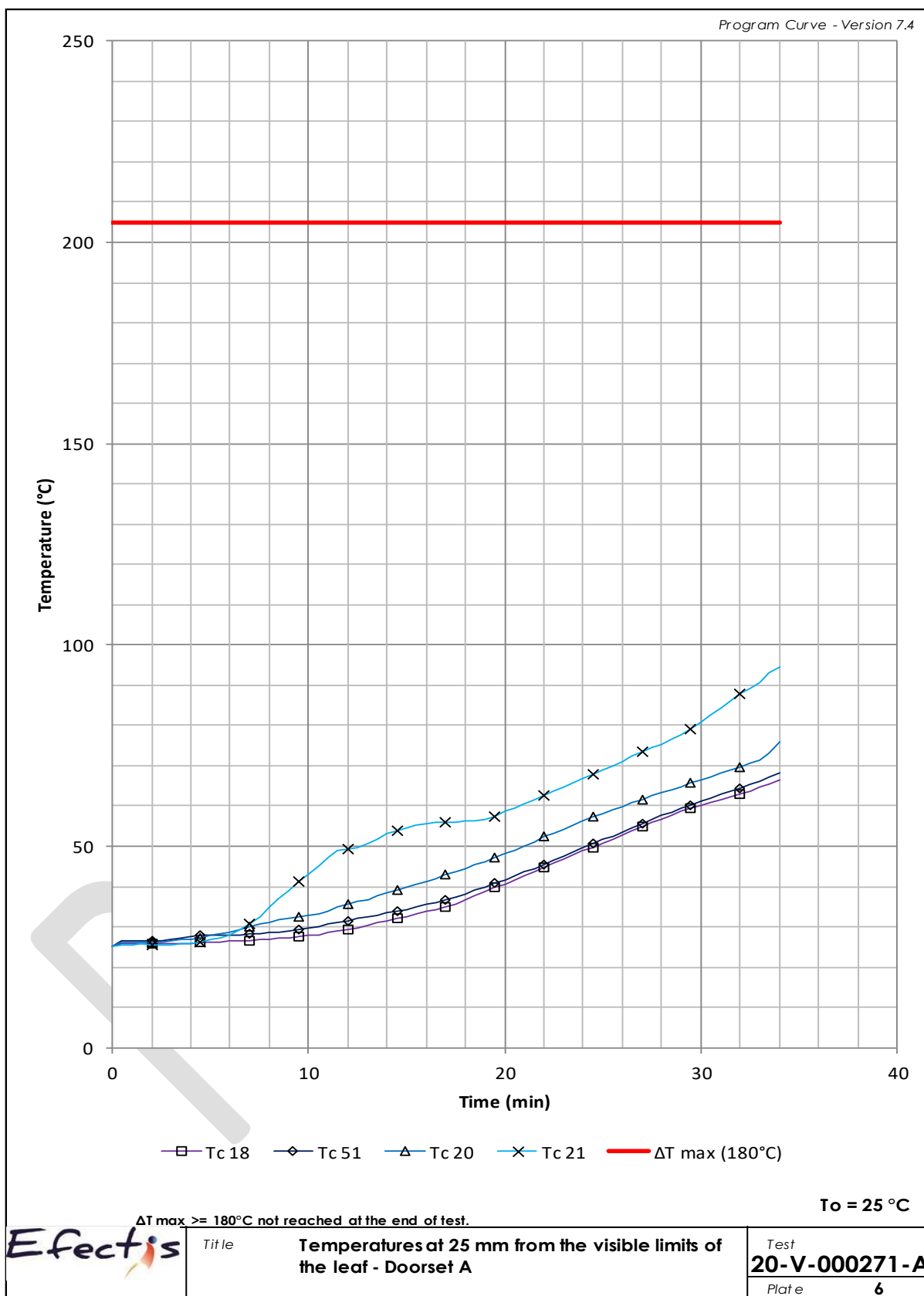


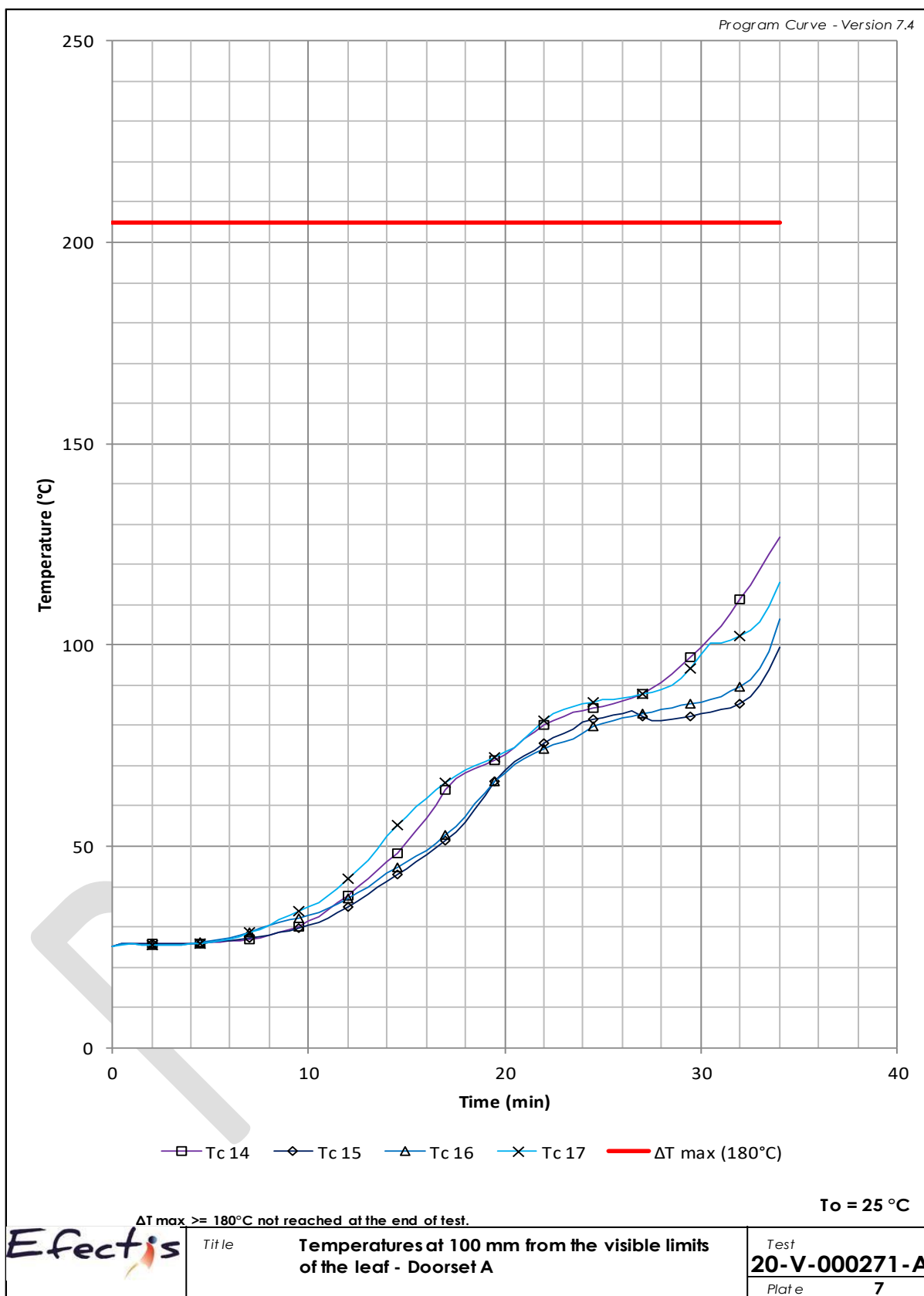


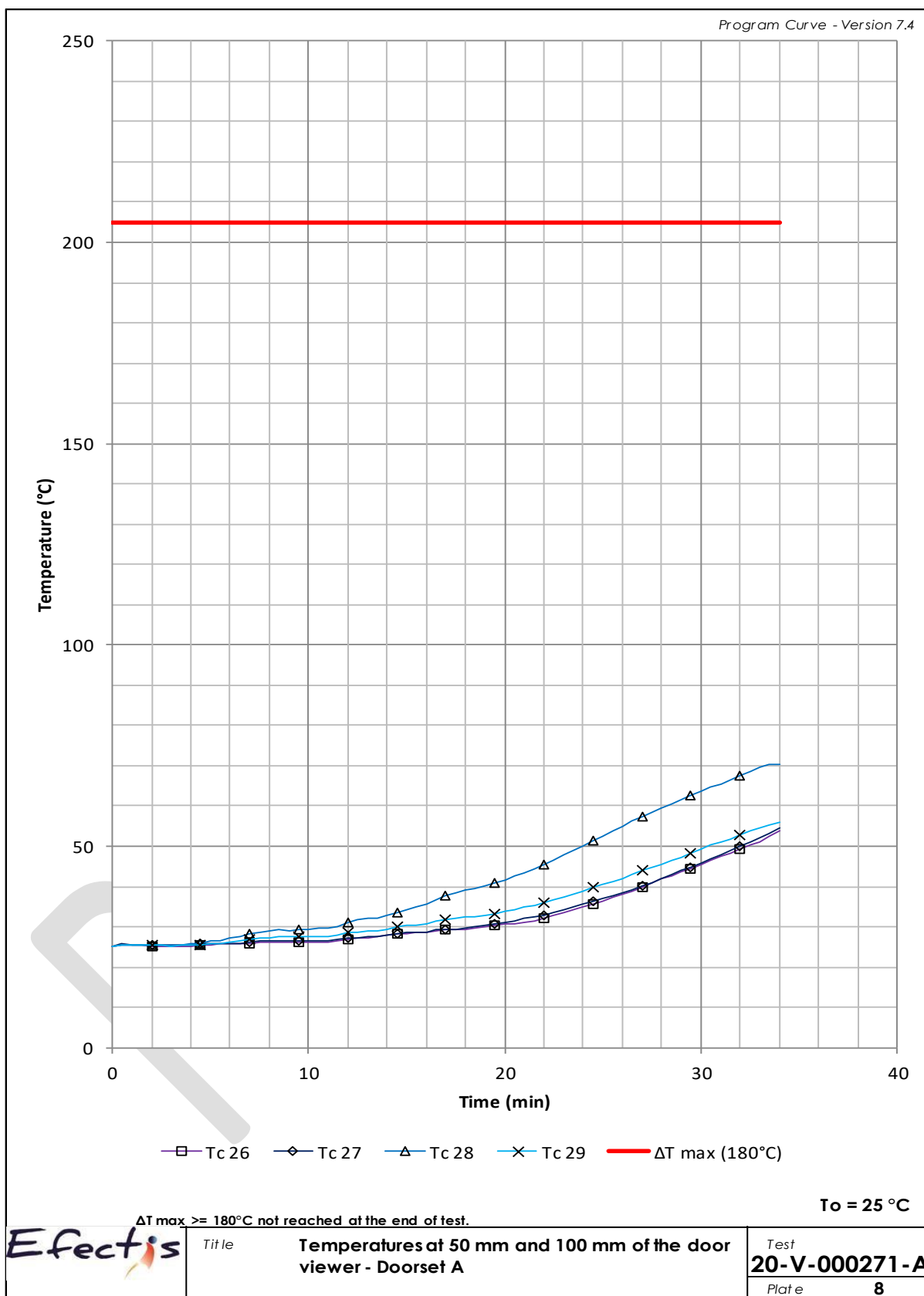


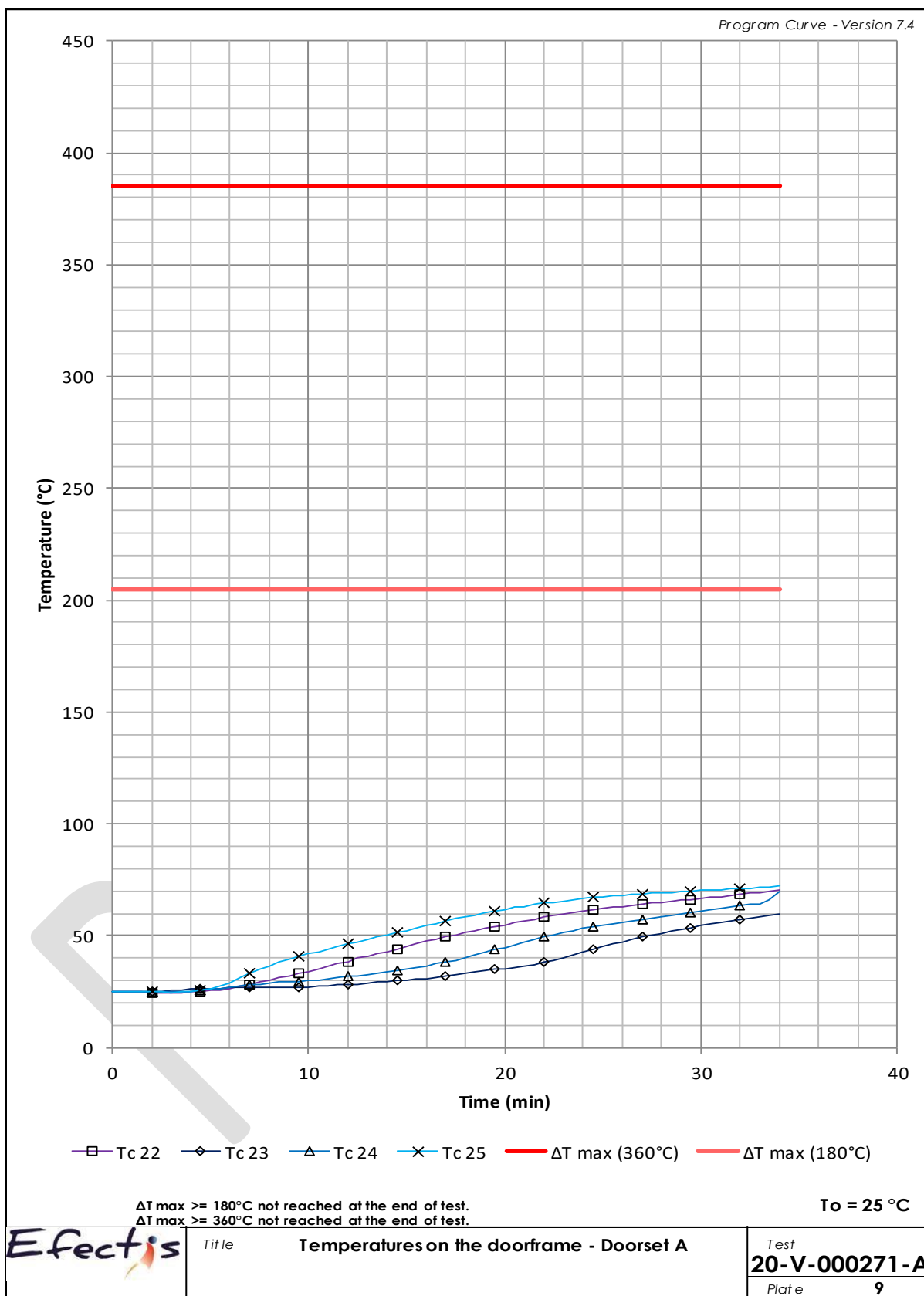


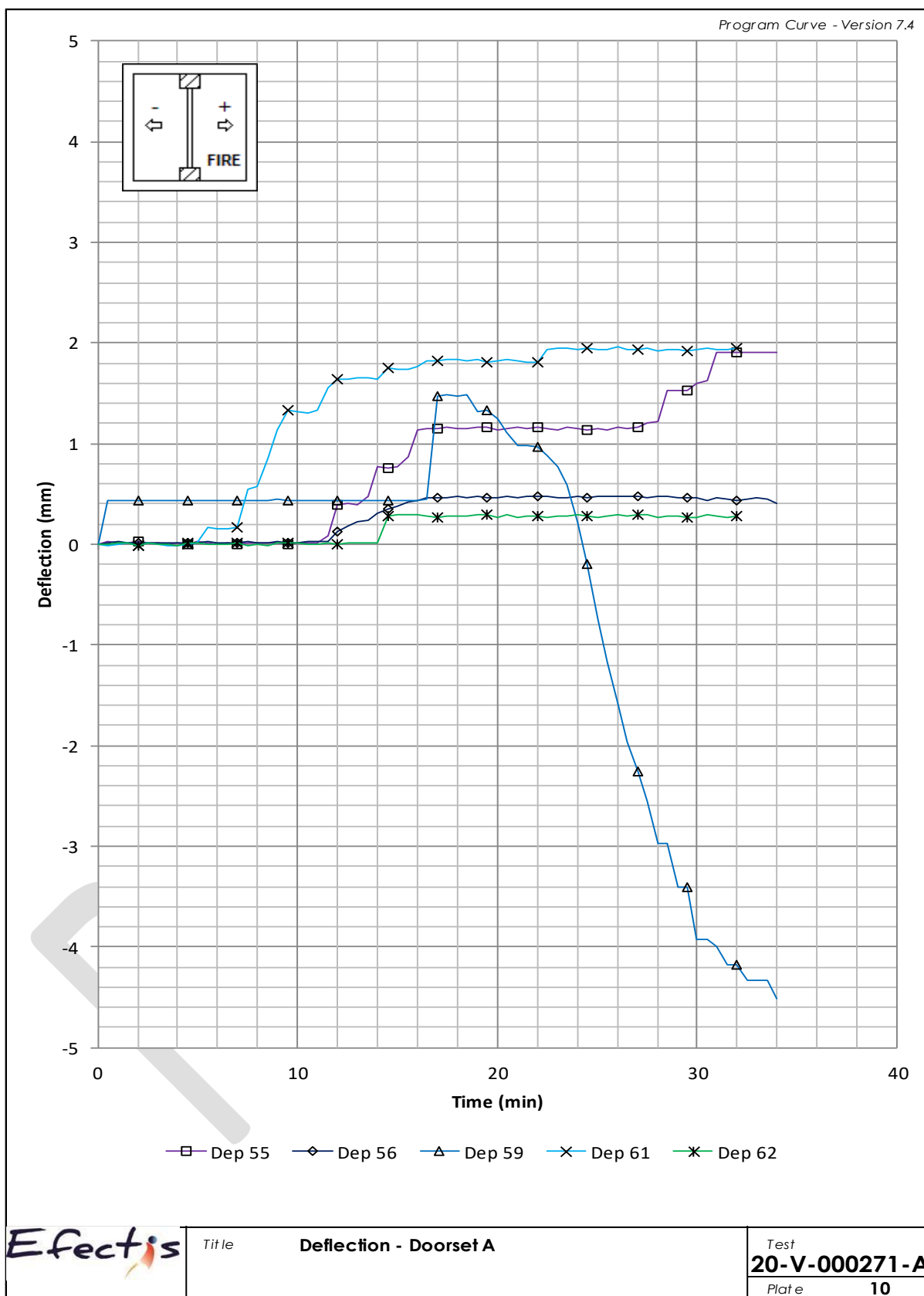


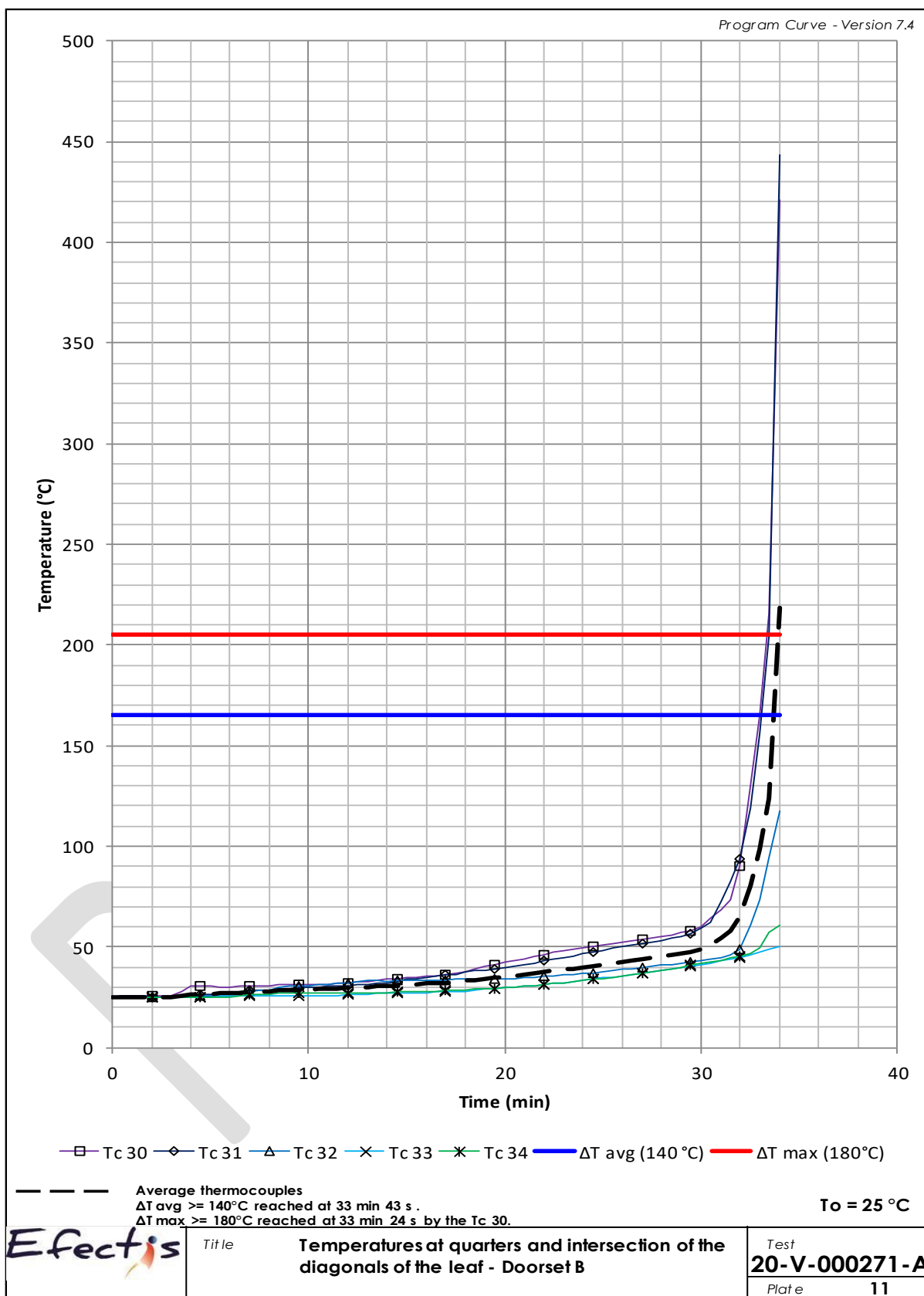


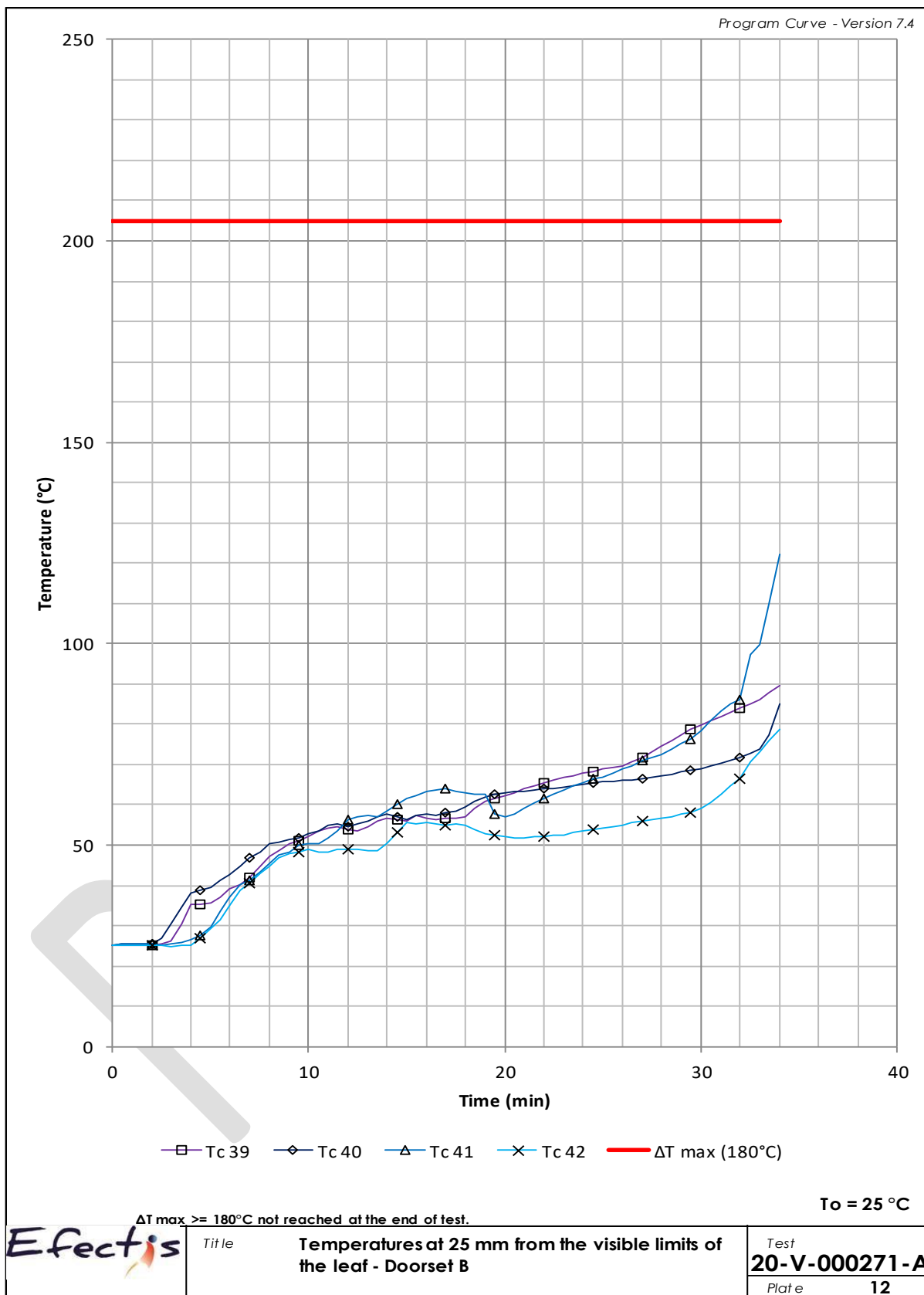


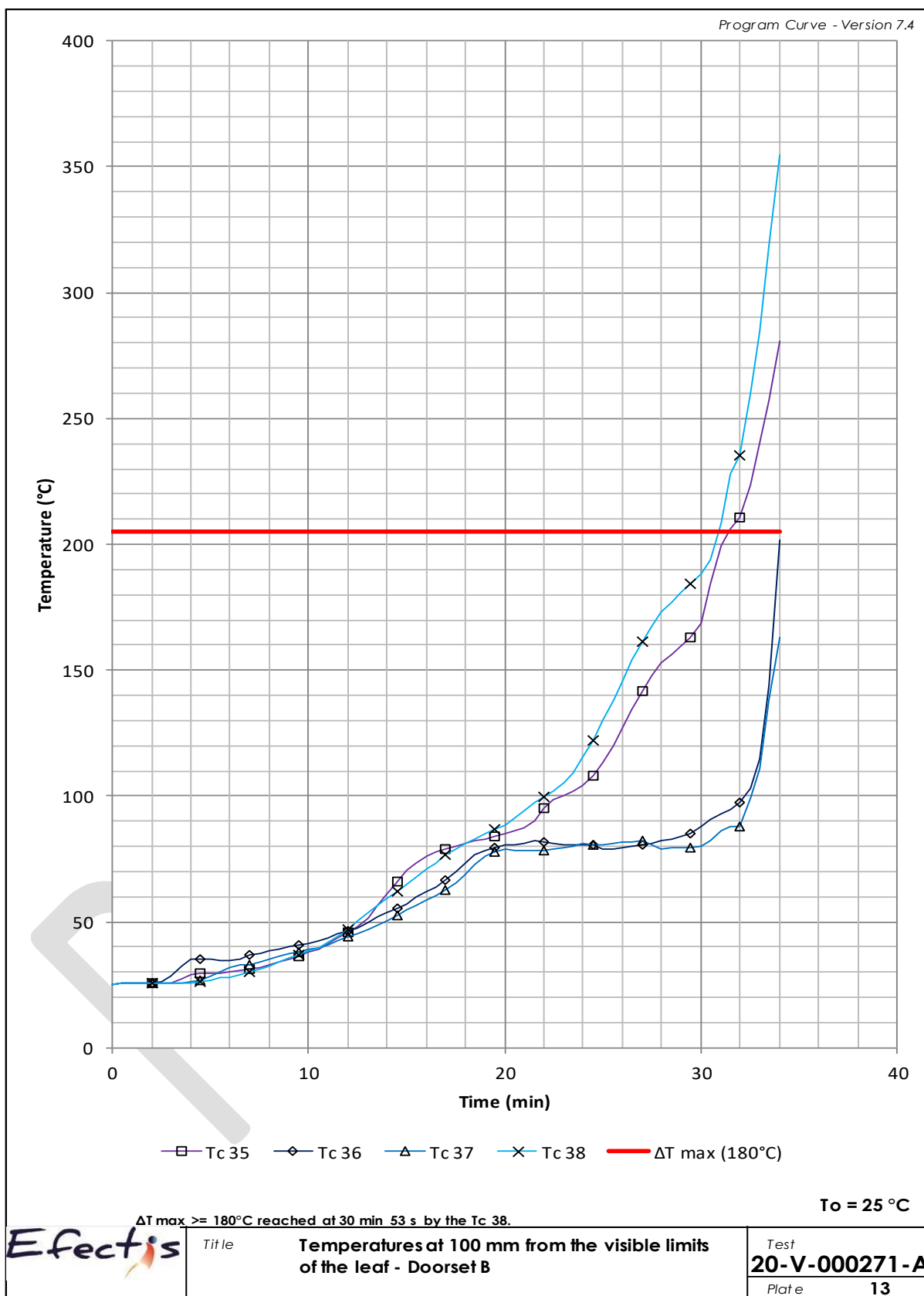


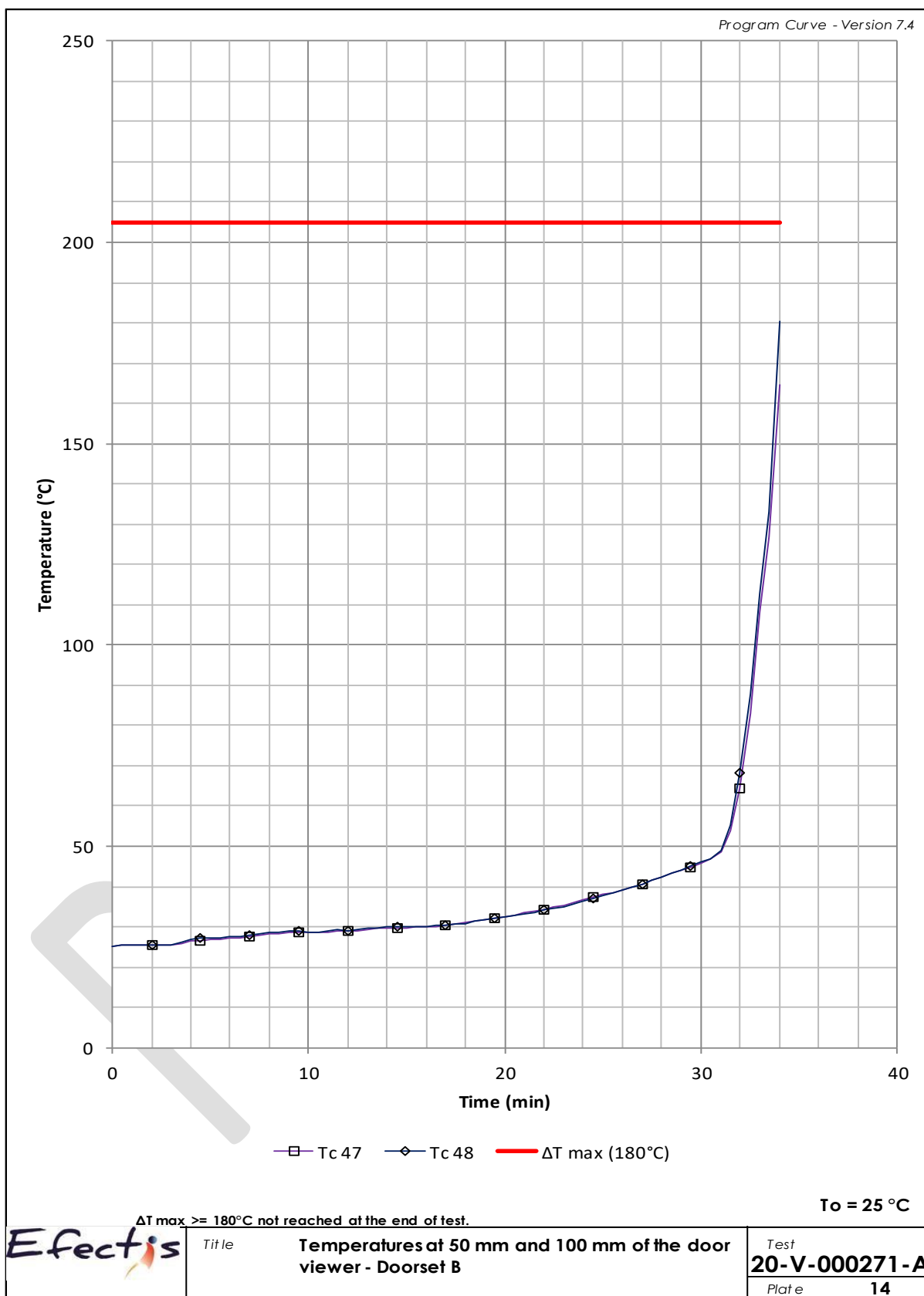


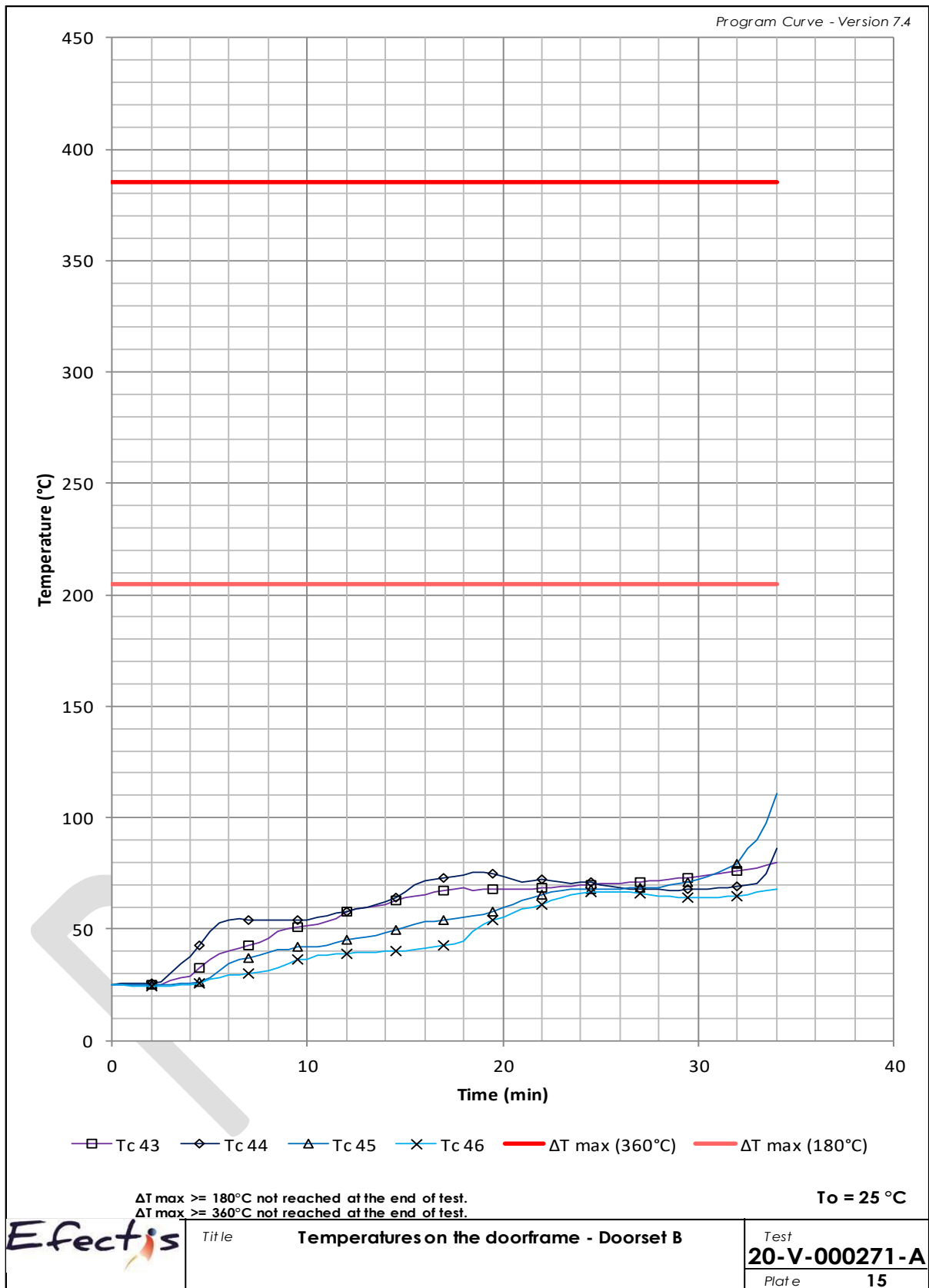












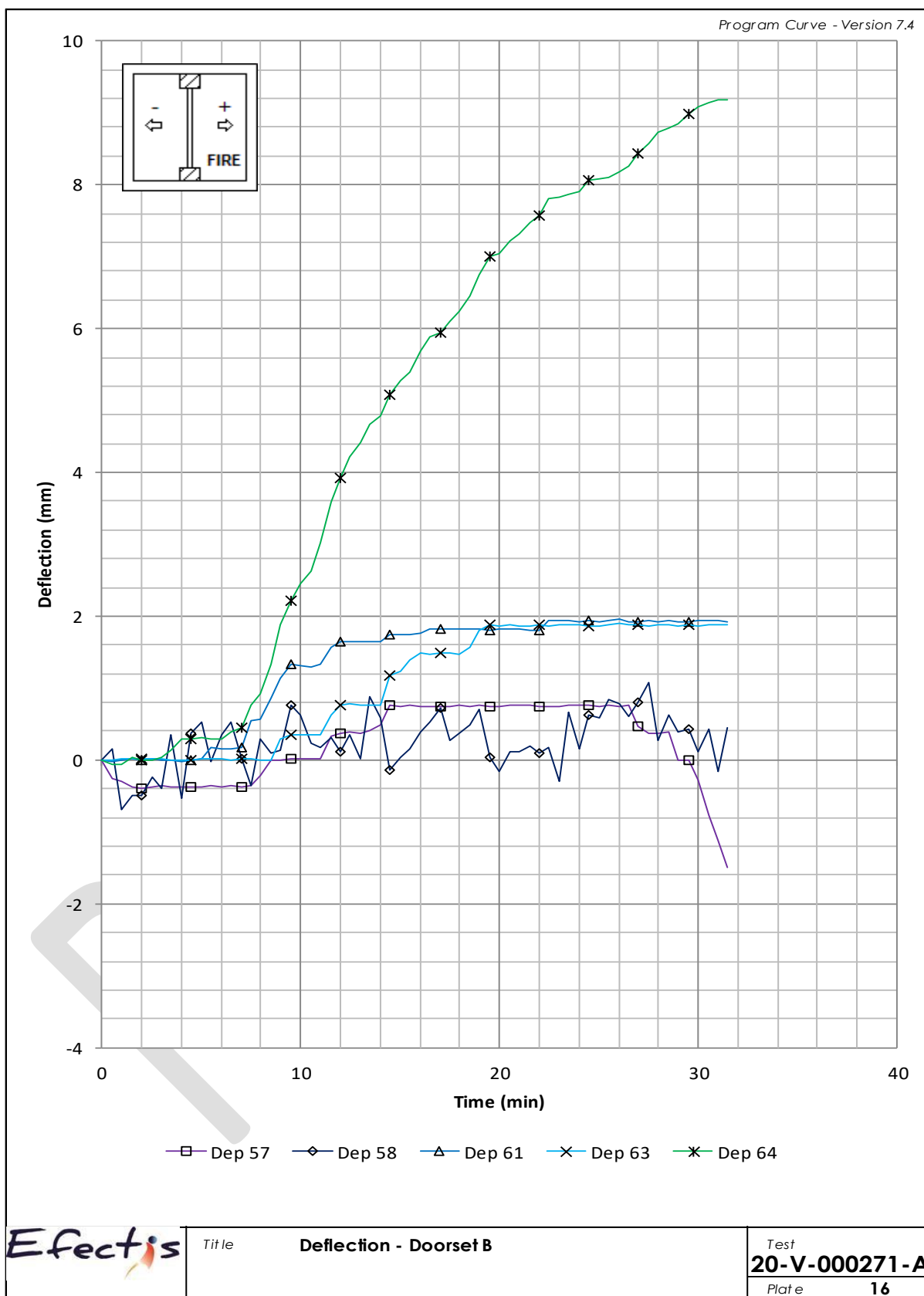




Photo A (top) **Non-exposed side of elements before the fire test.**

Photo B (bottom) **Non-exposed side of elements during the fire test.**

**Photo C (haut)**

Sustained flaming with a duration higher than 10 seconds on the opening through the leaf of doorset B after 31 minutes of testing.

Photo D (bas)

Sustained flaming with a duration higher than 10 seconds on the opening through the leaf of doorset A after 33 minutes of testing.

END OF THE REPORT