



**CONFIDENTIAL**

**Report: Chilt/P10056/02**

**Report on the testing of a door to  
relevant clauses of DD171 and EN 1192**

**Issue date: March 2011**



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**Prepared for:  
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## 1 Introduction

Chiltern Dynamics was commissioned by Pacific Rim Wood Limited to undertake testing of a doorset to clauses A.8, A.13, A.14 and A.15 of DD 171: 1987, Draft for development Guide to specifying performance requirements for hinged or pivoted doors and clauses 4.2, 4.3, 4.4 and 4.5 of BS EN 1192: 2000, Doors - Classification of strength requirements.

Testing was conducted at the Chiltern Dynamics testing laboratory from 26 April 2010 to 27 April 2010.

## 2 Objective

The test conducted to the British Draft for Development DD 171: 1987 clauses A.8, A.13, A.14 and A.15 and clauses 4.2, 4.3, 4.4 and 4.5 of BS EN 1192: 2000. with additional loading beyond the normal limits of the standards

## 3 Description of door

The specimen was identified as a Flamebreak doorset. The overall frame dimensions were 920mm wide x 2055mm high x 80mm deep and leaf dimensions were 838mm wide x 1981mm high x 44mm thick. The specimen was not fitted with a locking cylinder.

### Door leaf

		Material/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )
Stiles		Mixed timber hardwood*	36 x 30	480*
Rails		Mixed timber hardwood*	13 x 36	480*
Core		Albisia Falcata	3 layers 12 thick 55mm wide horizontal and vertical lamels	280*
Facings		Plywood	4 thick	400*
Adhesive	Facing	PVA*	-	-
	Lipping	PUR hot melt*	-	-
Lippings		Mixed hardwood* on vertical edges	8 thick	480*

\* As stated by client, not checked by laboratory

### Door frame

		Material/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )
Head & jambs		Laminated and finger jointed Whitewood*	80 x 50	450*
Rebate		Single type	50 x 18	-
Joints		Mortice and tenon and fixed with 2No. 5 x 100 screws	-	-

\* As stated by client, not checked by laboratory

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## Hardware

	Make/type	Size (mm)	Fixing details (dimensions in mm)
Hinges	3No. Nico 89mm Butt Hinge - NP(Ref.4513NP)*	89 x 36 blade size	3No. 4 x 40 screws into frame 3No. 4 x 50 screws into leaf
Locking mechanism	Fullex Crimebeater (Ref. CRB0002)*	16 wide	10No. 4 x 50 screws
Upper and lower keep	Fullex Crimebeater radius ends zinc and clear keep set (Ref. CRB0004-KE)*	180 x 40	4No. 4 x 25 screws
Centre keep	Fullex Crimebeater radius ends zinc and clear keep set (Ref. CRB0004-KE)*	220 x 45	3No. 4 x 25 screws
Handles	Hoppe 92/92 Security Lever/Lever - Silver anodised (Ref. CRBHAN0023)*	110 lever length	2No 5 x 60 machine screws

\* As stated by client, not checked by laboratory

## Perimeter sealing details

	Make/type	Size (mm)	Location
Door Edges	None present	-	-
Frame reveal	Plastec (Ref. T670)*	10 blade length	Rebate upstand of frame
	Intumescent with smoke seals Lorient (Ref. 1504DS)*	15 x 4 with 2No 4 long blades	Centre of rebate upstand
Seal continuity	Seal uninterrupted by hardware. Intumescent interrupted by keeps and hinges	-	-

\* As stated by client, not checked by laboratory

The above description was supplied by the client, and verified where possible by a Chiltern Dynamics engineer.

See Appendix 3 for schematic drawing of the doorset showing overall dimensions.

## 4 Test preparation

### Installation

The doorset was marked MTP/F10056/B by Chiltern Dynamics. The specimen was fitted into the test rig plumb square and without twist or bends. The surround in the test rig was stiff enough to withstand the test pressures without deflecting significantly, thereby simulating the support provided by the building to the doorframe.

## 5 Test procedure and results

Individual results for the mechanical tests are detailed in Appendix 2. Category of duty classified in accordance with DD171: 1987 and BS EN 1192: 2000.

Test Standard Clause	Performance Requirement	Category of duty achieved
A.8.1 Slamming shut impact test	As specified in clause 4.2 and table 2 of the standard	Severe duty*
A.8.2 Slamming open impact test	As specified in clause 4.2 and table 3 of the standard	Severe duty*
A.13 Closure against obstruction test	As specified in clause 4.2 and table 8 of the standard	Severe duty*
A.14 Resistance to jarring and vibration test	As specified in clause 4.2 and table 9 of the standard	Severe duty*
A.15 Abusive forces on door handles test	As specified in clause 4.2 and table 10 of the standard and there should be no loosening of the hardware fixings	Severe duty*

Test Standard Clause	Performance Requirement	Category of duty achieved
EN 947 Resistance to vertical loads	As specified in table A1 of BS EN 1192: 2000	Severe duty*
EN 948 Resistance to static torsion	As specified in table A1 of BS EN 1192: 2000	Severe duty*
EN 949 Resistance to soft and heavy body impact	As specified in table A1 of BS EN 1192: 2000	Severe duty*
EN 950 Resistance to hard body impact	As specified in table A1 of BS EN 1192:2000	Severe duty*


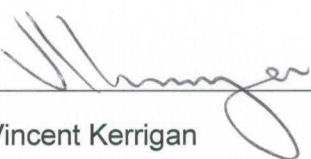
**\* See notes in Appendix 2 for details of testing and loading beyond the requirement of the standard**

See Appendix 1 for an explanation on the duty ratings.

The results only relate to the performance of the sample under the particular conditions of test.

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Date of issue:		04 - 03 - 2011

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## Appendix 1

### Duty grading

DD171: 1987 and BS EN 1192: 2000 duty grading is summarised as follows:

#### **LD - Light Duty**

Low frequency of use by those with a high incentive to exercise care, e.g. by private house owners - small chance of accident occurring or of misuse.

#### **MD - Medium Duty**

Medium frequency of use primarily by those with some incentive to exercise care - some chance of accident occurring or of misuse.

#### **HD - Heavy Duty**

High frequency of use by public and others with little incentive to exercise care. Chance of accident occurring and of misuse.

#### **SD - Severe Duty**

Subject to frequent violent usage.

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## Appendix 2

### Results of BS EN 1192 clause 4.2 (Test method BS EN 947) Resistance to vertical load

Applied force	1000N (Severe duty)
Damage to doorset	No apparent damage to doorset
Deflection after 3 minute recovery time	0.3mm

Applied force	1250N (additional to standard)
Damage to doorset	No apparent damage to doorset
Deflection after 3 minute recovery time	0.3mm

Note deflection limit of standard is 1mm

#### Resistance to vertical load test duty category

Door grade	Applied force (N)
Light duty	400
Medium duty	600
Heavy duty	800
Severe duty	1000

### Results of BS EN 1192 clause 4.3 (Test method BS EN 948) Resistance to static torsion

Applied force	350N (Severe duty)
Damage to doorset	No apparent damage to doorset
Deflection after 3 minute recovery time	1.8mm

Applied force	438N (additional to standard)
Damage to doorset	No apparent damage to doorset
Deflection after 3 minute recovery time	1.2mm

Note deflection limit of standard is 2mm

#### Resistance to static torsion duty category

Door grade	Applied force (N)
Light duty	200
Medium duty	250
Heavy duty	300
Severe duty	350

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**Results of BS EN 1192 clause 4.4 (Test method BS EN 949) Resistance to soft and heavy body impact**

Direction of impact	Opening face	Closing face
Impact energy	180J	180J
Damage to doorset	No apparent damage to doorset	No apparent damage to doorset
Deformation of leaf after 3 impacts	0.1m (Severe duty)	0.1(Severe duty)
Deformation of leaf after a further 3 impacts	0.1m (additional to standard)	0.2 (additional to standard)

Note deflection limit of standard is 2mm

**Resistance to soft and heavy body impact duty category**

Door grade	Impact energy (J)
Light duty	30
Medium duty	60
Heavy duty	120
Severe duty	180

**Results of DD171 Clause 4.3 (Test Clause A.8) Slamming shut impact test**

Number of impacts	150 impacts (Severe duty)
Damage to doorset	No apparent damage to doorset
Number of impacts	200 impacts (additional to standard)
Damage to doorset	No apparent damage to doorset

**Slamming shut impact test duty category**

Door grade	Number of impacts
Light duty	10
Medium duty	20
Heavy duty	100
Severe duty	150

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**Results of DD171 Clause 4.4 (Test Clause A.8) Slamming open impact test**

Impact energy	50J
Damage to doorset	After 20 impacts at 50J no apparent damage to doorset (Severe duty)
Damage to doorset	After 40 impacts at 50J no apparent damage to doorset (additional to standard)

**Slamming open impact test duty category**

Door grade	Impact energy (J)
Light duty	5
Medium duty	25
Heavy duty	50
Severe duty	50

**Results of DD171 Clause 4.9 (Test clause A.13) closure against obstruction test**

Applied force	200N (Severe duty)
Damage to doorset	Some bending of the bottom hinge however doorset continues to operate
Applied force	300N (additional to standard)
Damage to doorset	Some bending of the bottom hinge causing friction between the leading edge of the door leaf and frame however doorset continues to operate

**Closure against obstruction duty category**

Door grade	Applied force (N)
Light duty	} 200
Medium duty	
Heavy duty	
Severe duty	

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**Results of DD171 Clause 4.10 (Test clause A.14) Resistance to jarring and vibration test**

Number of impacts	200 impacts (Severe duty)
Damage to doorset	No apparent damage
Number of impacts	300 impacts (additional to standard)
Damage to doorset	No apparent damage

**Resistance to jarring and vibration duty category**

Door grade	Number of impacts
Light duty	50
Medium duty	100
Heavy duty	150
Severe duty	200

**Results of DD171 Clause 4.11 (Test clause A.15) Resistance of hardware to abusive forces test**

Applied force	750N
Damage to doorset	No apparent damage

**Resistance to abusive forces duty category**

Door grade	Applied force
Light duty	} 750 N
Medium duty	
Heavy duty	
Severe duty	

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**Results of BS EN 1192 clause 4.5 (Test method BS EN 950) Resistance to hard body impact**

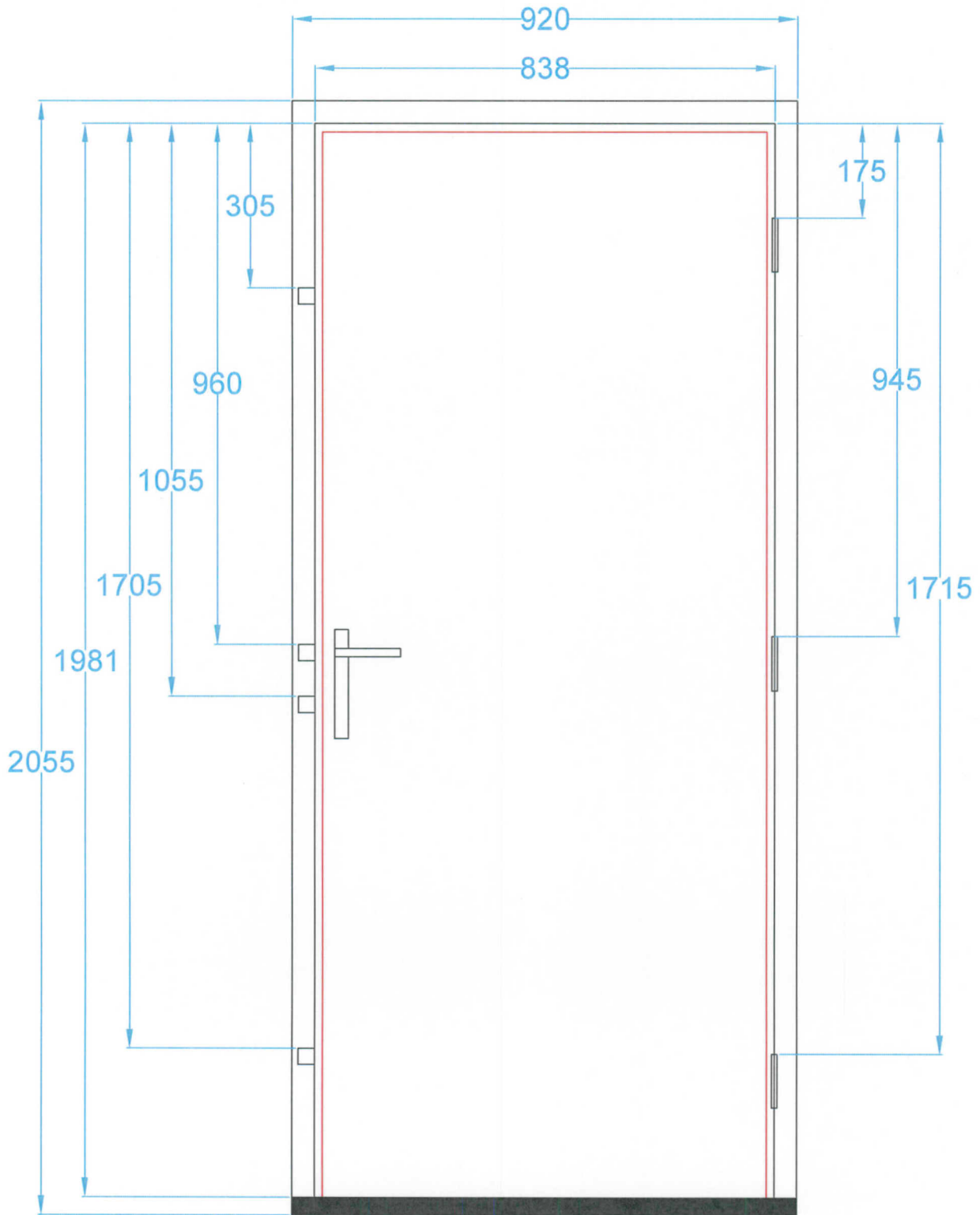
Average indentation depth of all points impact tested (mm)	0.41mm
Number of impact points exceeding 3mm depth	0
Damage to door leaf	No apparent damage

Note: Mean surface irregularity measured at +/- 0.05mm

**Resistance to hard body impact duty category**

Door grade	Applied force (J)
Light duty	1.5
Medium duty	3
Heavy duty	5
Severe duty	8

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Schematic drawing showing overall dimensions of doorset and hardware locations

Date Drawn  
 30/11/10

Drawn By  
 PA

Scale Not to Scale  
 All dimensions in mm  
 unless otherwise stated

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## Appendix 4

### Photograph showing doorset



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## Appendix 5

### List of testing apparatus

Ref No	Description
T7.19	Door test rig (security rig)
T5.149	Measuring tape
T6.46	Torque wrench with key fitting
T6.75	Force gauge
T6.7 series	100N load bags
T5.167	Angle template
T6.7E	2No 50N load bags
T6.74	1No 15kg load bag
T5.86 series	Stop watch
T6.7L	Soft body impactor 30 kg
T5.174	Aluminium block
	A dry hard wood slip, 50mm by 50mm by 10mm and a mass between 15g and 20g
	Laser height gauge

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