

SINGAPORE CIVIL DEFENCE FORCE

HQ SINGAPORE CIVIL DEFENCE FORCE
91 Ubi Avenue 4 Singapore 408827
Website: [http://: www.scdf.gov.sg](http://www.scdf.gov.sg)



Please quote our ref. no. in all future correspondences

Our File Ref: CD/FSSB/12/01/03/04

DID: 68481470
FAX: 68481493

8 Feb 2006

President, Singapore Institute of Architects (SIA)
President, Institution of Engineers, Singapore (IES)
President, Association of Consulting Engineers, Singapore (ACES)
President, Real Estates Development Association of Singapore (REDAS)
Registrar, Board of Architects (BOA)
Registrar, Professional Engineers Board (PEB)

Dear Sir/Mdm,

PRODUCT LISTING SCHEME (PLS) FOR STOREY SHELTER (SS) DOORS

With the successful implementation of product listing scheme for Household Shelter doors, SCDF and BCA have been working closely with PSB to extend the Product Listing Scheme to Storey Shelter (SS) Door for the purpose of quality control in the manufacturing of the SS doors.

2 On the proposed PLS for SS doors, we have scheduled a briefing on 25 Jan 2006 to notify all the approved SS door suppliers that this scheme would be implemented with effect from **1st June 2006**. Only SS doors whose design and details have been evaluated by the Civil Defence Shelter Engineering Department (CSDS) of BCA and approved by SCDF (for which a BCA-approved SS door reference number would be issued) are eligible for the PLS which is administered by PSB.

3 We would like to inform your institution or association that only SS doors registered under the PLS and issued with PLS label shall be supplied to residential development (required under the CD Shelter Act 1997) when their building plans are submitted to BCA for approval on or after **1st June 2006**.

4 With the implementation of PLS requirement for SS doors, Clause 5.2 of the "Technical Requirements For Storey Shelters 1997" is amended to read:

"Only SS doors of an approved design, and which have been certified and listed under the Product Listing Scheme to the test standards and specifications in **Annex A** shall be used."

A copy of **Annex A** to the Technical Requirements for SS 1997 is attached.



ISO 9001 : 2000 Cert.No. : 2146

A PROUD MEMBER OF THE HOME TEAM



5 We would appreciate it if you could disseminate the contents of this circular to members of your Institution or Association.

6 Please contact undersigned at 68481470 or Maj Ng Shu Heng at 68481406, should you require further clarifications.

Yours faithfully,

(Transmitted via e-mail)

Cpt Yoong Eng Chee
SO Shelter Development
for Commissioner, Singapore Civil Defence Force

cc

Members of FSSD Standing Committee

President, SISV

CEO, HDB
Attn: Mr Lau Joo Ming

CEO, URA

CEO, BCA
Attn: Deputy CEO (Building Control)
Director (Special Functions)
Senior Manager (CDSD)
Senior Engineer (CDSD)

Prefab Technology 3 Pte Ltd
99 Pioneer Road
Singapore 639580

Tacam Steel Pte Ltd
541 Bukit Batok St 23
#05-00 Tacam Industrial Building
Singapore 659546

Nam Lee Pressed Metal
Industries Ltd
31 Senoko Drive
Senoko Industrial Estate
Singapore 758216

Yong Tai Loong Pte Ltd
461 Macpherson Road
Singapore 368179



ISO 9001 : 2000 Cert.No. : 2146



TEST STANDARDS AND SPECIFICATIONS FOR STOREY SHELTER DOORS

TYPE TESTS		
S/N	TEST	STANDARD/ SPECIFICATION
1	Door locking mechanism cyclic test	<p><u>Test Cycles</u></p> <p>The entire test shall consist of 60,000 cycles, which in turn comprise two cyclic types :</p> <ul style="list-style-type: none"> • Type A : 10,000 in the Civil Defence (CD) mode when the lock bolts are activated • Type B : 50,000 for normal opening and closing of door (based on 90° angle of opening function) <p>(<u>Note</u> : Type A cycles are to be performed interspersed between the Type B cycles in the ratio 1:5 i.e. 1 Type A cycle to be done after every 5 Type B cycles.)</p> <p><u>Test Method and Requirements</u></p> <ul style="list-style-type: none"> • The test is conducted using the test rig designed to be able to support the doorset and holding it rigidly in place, preventing any movement that may occur during the tests. • 5 Type B cycles to be carried out. Each cycle shall consist of the latch of lockset unlatching (with its lever handle completing a 90° angle movement), followed by the door leaf opening to 90° angle and then by the closing of the door leaf and finally latching in place. During each cycle, the lockset shall be able to latch fully. • After the 5 Type B cycles, 1 Type A cycle to be performed. The type A cycle is a 90° angle movement of the lever handle of the lockset in locking and unlocking the doorset. During each cycle, the lockset shall fully engage the bolts onto the door frame, with the lever handle completing the full cycle of operation without straining. • This pattern of 5 Type B cycles followed by 1 Type A cycle is to be repeated 10,000 times.

TYPE TESTS		
S/N	TEST	STANDARD/ SPECIFICATION
		<p><u>After completion of 60,000 cycles</u></p> <ul style="list-style-type: none"> • After the test the doorset shall be checked manually that it is still able to lock in place without causing any strains and all functions of the lockset shall still operate. • Check that there shall be no damages, or evidence of undue wear or loosening of any parts of the doorset including the hardwares installed, or other defects that may impair its reliability of functioning and the test leaf shall remain connected to the frame. • Check that the lockset's spring bolt through the striking plate shall continue to function correctly, and be able to return to its normally extended position under its own spring pressure, and all functions of the lockset shall still operate. • Check for visible cracking or breakage of any components on the hinges; and check that the doorset is capable of closing properly, maintaining all clearances between leaf to frame and floor as measured before the test.
2	Water-tightness test	Water tightness test shall be carried out on the door leaf and frame assembly in their closed position. The enclosure formed by the door leaf and frame assembly in their closed position shall be filled with water to a uniform depth of 25 mm water for a period of two hours. There shall be no seepage of water within this period.
3	Rubber gasket test*	ASTM D1056 (Grade 2A3, 2A4, 2A5, 2B3, 2B4 or 2B5)

TYPE TESTS			
S/N	TEST	STANDARD/ SPECIFICATION	
		CED	Electro-galvanised
4	CED/galvanised coating test*	<ul style="list-style-type: none"> • ASTM D3359 <ul style="list-style-type: none"> - Rating 5B (No removal of coating) • SS5 : Part F2 <ul style="list-style-type: none"> - The coating shall withstand test load of 2000g • ASTM 3363 <ul style="list-style-type: none"> - 2H shall be the hardest pencil that does not scratch the film • SS5 : Part B1 <ul style="list-style-type: none"> - Dry film thickness shall be $20 \pm 5 \mu\text{m}$ • SS5 : Part G1. Test duration = 500 hours <ul style="list-style-type: none"> - The coating may have any quantity of Size 2 blisters but shall have no more than Density 2 Size 3 blisters as illustrated in ISO 4628-2. - Degree of rusting shall not be more than scale Ri 2 according to ISO 4628-3 • SS5 : Part G6. Test duration = 500 hours <ul style="list-style-type: none"> - The coating shall have no more than Density 2 Size 2 blisters as illustrated in ISO 4628-2. - Degree of rusting shall not be more than scale Ri 1 according to ISO 4628-3 	<ul style="list-style-type: none"> • ASTM A90 Coating thickness = 3.5 microns minimum

* The test methods refer to in the relevant ASTM, SS and ISO shall be of the latest version.

SURVEILLANCE TESTS		
S/N	TEST	STANDARD/SPECIFICATION
1	Door locking mechanism cyclic test (Once in 3 years)	<p><u>Test Cycles</u></p> <p>The entire test shall consist of 60,000 cycles, which in turn comprise two cyclic types :</p> <ul style="list-style-type: none"> • Type A : 10,000 in the Civil Defence (CD) mode when the lock bolts are activated • Type B : 50,000 for normal opening and closing of door (based on 90° angle of opening function) <p>(<u>Note</u> : Type A cycles are to be performed interspersed between the Type B cycles in the ratio 1:5 i.e. 1 Type A cycle to be done after every 5 Type B cycles.)</p> <p><u>Test Method and Requirements</u></p> <ul style="list-style-type: none"> • The test is conducted using the test rig designed to be able to support the doorset and holding it rigidly in place, preventing any movement that may occur during the tests. • 5 Type B cycles to be carried out. Each cycle shall consist of the latch of lockset unlatching (with its lever handle completing a 90° angle movement), followed by the door leaf opening to 90° angle and then by the closing of the door leaf and finally latching in place. During each cycle, the lockset shall be able to latch fully. • After the 5 Type B cycles, 1 Type A cycle to be performed. The type A cycle is a 90° angle movement of the lever handle of the lockset in locking and unlocking the doorset. During each cycle, the lockset shall fully engage the bolts onto the door frame, with the lever handle completing the full cycle of operation without straining. • This pattern of 5 Type B cycles followed by 1 Type A cycle is to be repeated 10,000 times.

SURVEILLANCE TESTS		
S/N	TEST	STANDARD/SPECIFICATION
		<p><u>After completion of 60,000 cycles</u></p> <ul style="list-style-type: none"> • After the test the doorset shall be checked manually that it is still able to lock in place without causing any strains and all functions of the lockset shall still operate. • Check that there shall be no damages, or evidence of undue wear or loosening of any parts of the doorset including the hardwares installed, or other defects that may impair its reliability of functioning and the test leaf shall remain connected to the frame. • Check that the lockset's spring bolt through the striking plate shall continue to function correctly, and be able to return to its normally extended position under its own spring pressure, and all functions of the lockset shall still operate. • Check for visible cracking or breakage of any components on the hinges; and check that the doorset is capable of closing properly, maintaining all clearances between leaf to frame and floor as measured before the test.
2	Water-tightness test	Water tightness test shall be carried out on the door leaf and frame assembly in their closed position. The enclosure formed by the door leaf and frame assembly in their closed position shall be filled with water to a uniform depth of 25 mm water for a period of two hours. There shall be no seepage of water within this period.
3	Production test	Dimensional checks in accordance to approved drawings. The door frame can be double rebated to facilitate the installation of a fire door.

SURVEILLANCE TESTS		
S/N	TEST	STANDARD/SPECIFICATION
4	CED/galvanised coating test*	CED
		Electro-galvanised
		<ul style="list-style-type: none"> • ASTM D3359 <ul style="list-style-type: none"> - Rating 5B (No removal of coating) • SS5 : Part F2 <ul style="list-style-type: none"> - The coating shall withstand test load of 2000g • ASTM 3363 <ul style="list-style-type: none"> - 2H shall be the hardest pencil that does not scratch the film • SS5 : Part B1 <ul style="list-style-type: none"> - Dry film thickness shall be $20 \pm 5 \mu\text{m}$ • SS5 : Part G1. Test duration = 500 hours <ul style="list-style-type: none"> - The coating may have any quantity of Size 2 blisters but, shall have no more than Density 2 Size 3 blisters as illustrated in ISO 4628-2. - Degree of rusting shall not be more than scale Ri 2 according to ISO 4628-3 • SS5 : Part G6. Test duration = 500 hours <ul style="list-style-type: none"> - The coating shall have no more than Density 2 Size 2 blisters as illustrated in ISO 4628-2. - Degree of rusting shall not be more than scale Ri 1 according to ISO 4628-3
5	Rubber gasket test*	ASTM D1056 (Grade 2A3, 2A4, 2A5, 2B3, 2B4 or 2B5)

*** The test methods refer to in the relevant ASTM, SS and ISO shall be of the latest version.**