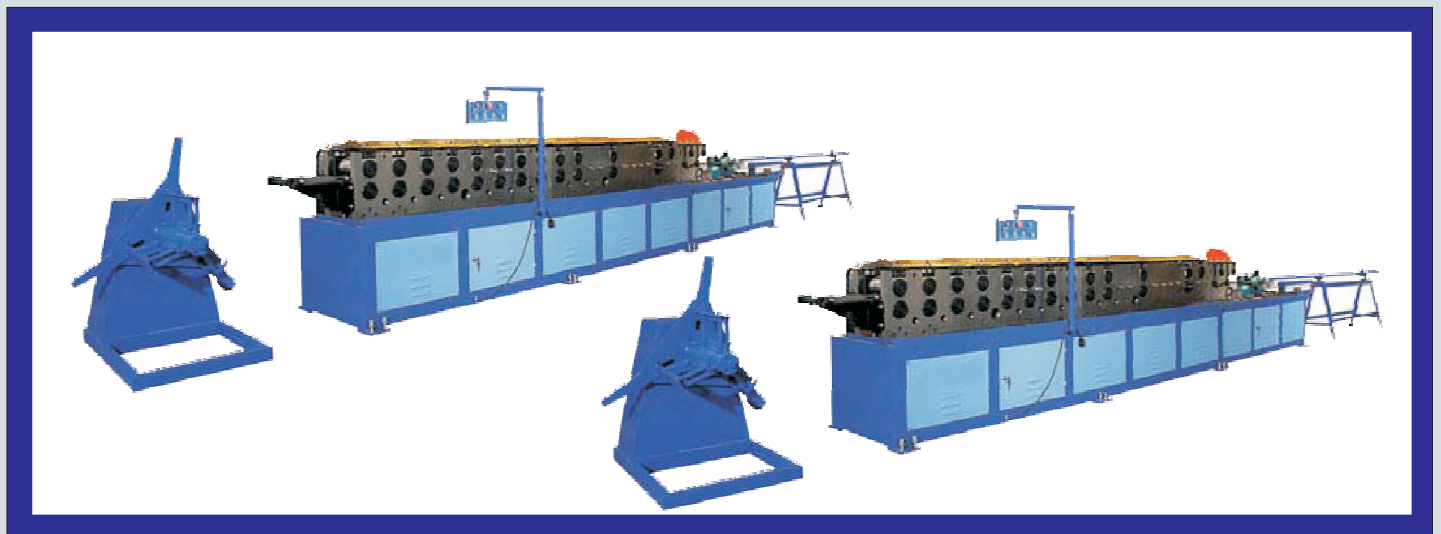
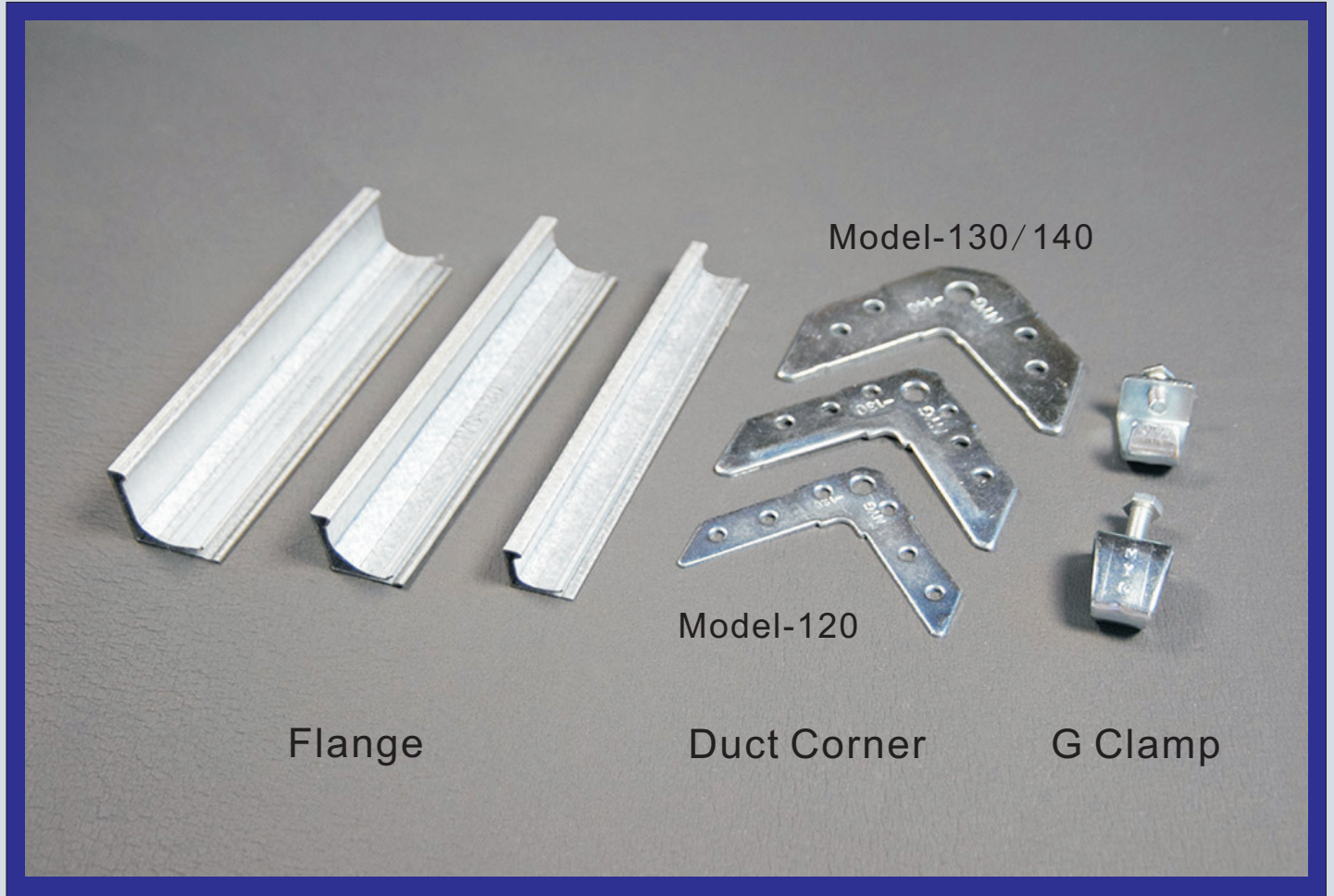




東莞漫亞
五金製品有限公司
Dongguan Manya
Hardware Products Company Limited



Manya Flange Joint System



Manya Flange Joint System Production Line



Flange Joint System Testing Report

Model:M-120

Campbell Shillinglaw Lau Ltd
金寶聲學環保顧問有限公司

Our Ref: CSLL011-2009/090604R1

REPORT ON DEFLECTION AND AIR LEAKAGE OF DUCTWORK TEST TO DW144 (SPECIFICATION FOR SHEET METAL DUCTWORK 1998) FOR MEDIUM PRESSURE SYSTEM ON MYG-120 SLIDE ON FLANGE DUCT JOINTING SYSTEM (CLASSIFICATION TO TMI 1987)

DATE : 8, 21 May 2009
TESTED BY : Mr. Wilson LEUNG & Mr. YALE WANG (CSLA)
REPORT BY : Mr. YALE WANG (CSLA)
SPONSOR OF TEST : MYG INTERNATIONAL LTD.
TEST LOCATION : MYG FACTORY, WASHIA CENTRE ROAD, LANSKIA INDUSTRIAL AREA, QIAO-TAI TOWN, DONG-GUAN CITY, PRC.

Flat A 15F, Valiant Commercial Building, 22-24 Pitt Avenue, Tsim She Tui, Kowloon, Hong Kong
香港九龍尖沙咀彌敦道22-24號基業商業大廈15樓A室
Tel 電話 (852) 2328 2622 Fax 傳真號碼 (852) 2387 5184 Email 電郵 aml@campbellshillinglaw.com.hk

1. INTRODUCTION

Campbell Shillinglaw Lau Limited were commissioned by MYG International Ltd to carry out duct deflection behavior and air leakage test on their MYG-120 slide on flange duct jointing system in accordance with DW144 (specification for sheet metal ductwork 1998) and TMI (1987).

2. TEST APPARATUS

a) The Test apparatus consists primarily of the followings:-
i) A centrifugal flow fan
ii) A bypass damper
iii) A U-tube manometers giving readings of the differential pressure between the sheet metal duct assembly and the ambient.
iv) A flexible hose connecting the connecting the fan-duct assembly to the sheet metal duct.
v) A dial gauge giving readings of 0.01mm resolution and a maximum traverse of 25mm.
vi) An Electronic Manometer LM1 measures and digitally displays the duct pressure and the corresponding inlet flowrate to sustain the duct leakage.

The overall experimental set up is as shown in 090604G, 090604O and the detail set up for the deflection measurement is as shown in 090604I.

3. TEST SAMPLE

The test specimen of the following dimension, 090604A, were constructed:
Specimen: 2480mm(L) x 1000mm(W) x 350mm(H)
(Rated to J2 medium pressure)

The test sample consists of a rectangular duct (0.8mm thick) which was prefabricated by pittsburg lock seam, 090604H, and ready for duct section assembly.

The MYG-120 flange (090604L) was made by an ACL machine. The production detail and assembling of the flange are described in appendix I.

The MYG-120 slide on flange was fastened to the duct section to form a cross joint by spot welding at 50mm from corners and 300mm o.c. for the rest. Configuration of the flange joint, the sheet metal duct and the G-clamp are as shown in 090604L.

4. RESULTS

4.1 Test Result of deflection

| Dial Gauge Reading | Specimen | Pressure Pa | | | | | | | | |
|--------------------|----------|-------------|-----|------|-----------|-----|-----|-----|-----|---|
| | | 0 | 500 | 1000 | Over 1000 | 500 | 0 | | | |
| | | 0 | 1.7 | 3.8 | 4.1 | 3.9 | 1.6 | 0.1 | 3.8 | 4 |

N.B. The allowable deflection is in accordance to TMI and equal to 1/250 of width.

4.2 Test Result of air leakage

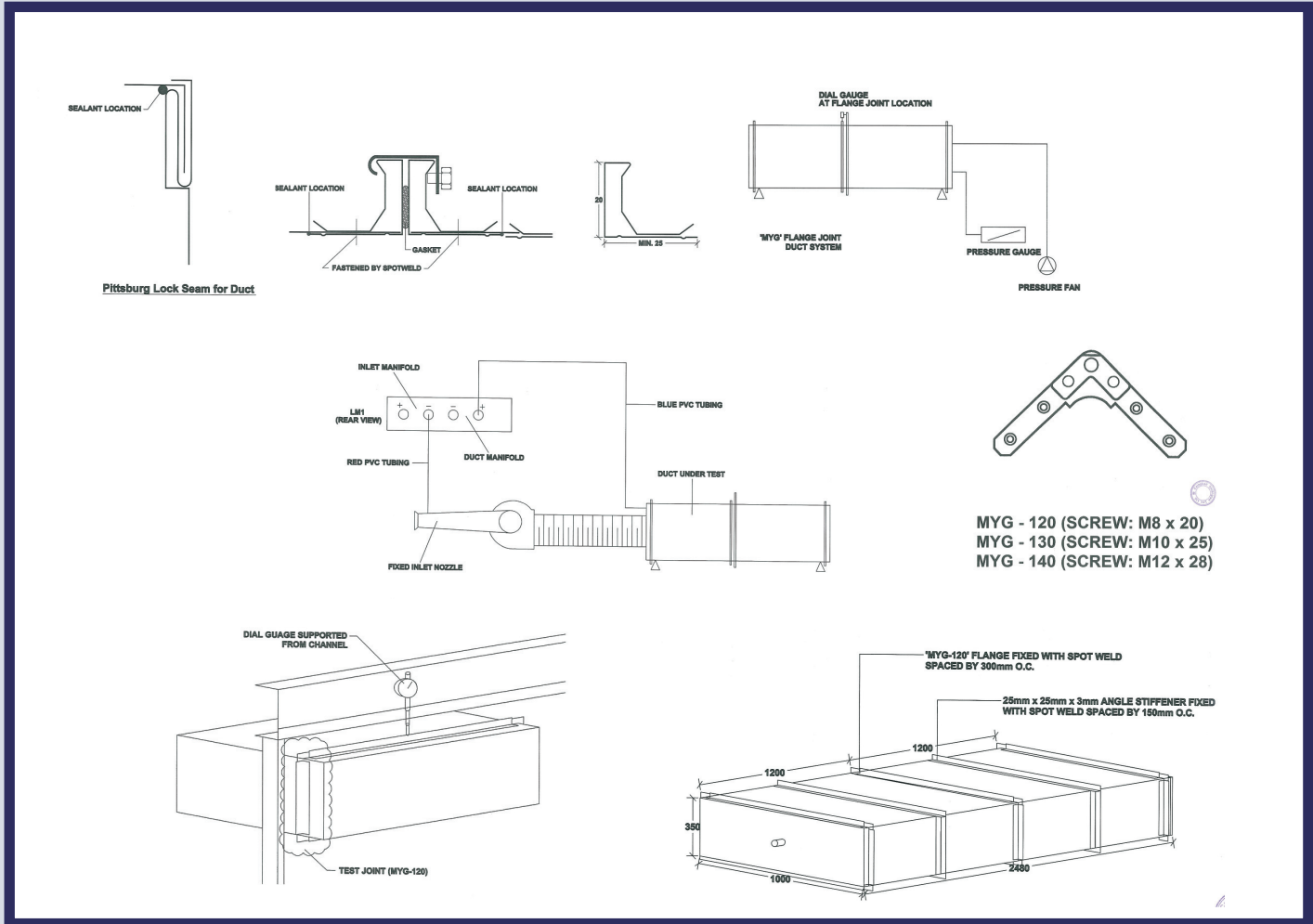
| Duct Size WxH (mm) | Pressure (Pa) | Square Area (Sq. Meter) | Test Leakage (Litres/Sec) | Max. Allowed Leakage (Litres/Sec) |
|--------------------|---------------|-------------------------|---------------------------|-----------------------------------|
| 1000 x 250 | 1000 | 6.75 | 1.89 | 2.16 |

N.B. The allowable air leakage is in accordance to TMI and equal to 40% of maximum permitted loss for the appropriate pressure class, as indicated in Table 17 of DW/144.

5. CONCLUSION

As shown in section 4 "Results", test specimen does not exceed the deflection and air leakage requirement of DW144 (specification for sheet metal ductwork 1998) and TMI (1987) as stipulated.

CHECKED BY: *Leslie Lau*
Leslie Lau
For and on behalf of
Campbell Shillinglaw Lau Ltd.





Flange Joint System Testing Report

Model:M-130

Campbell Shillinglaw Lau Ltd
金寶聲學環保顧問有限公司

Our Ref: CSL011-2009/09064R3

REPORT ON DEFLECTION AND AIR LEAKAGE OF DUCTWORK TEST TO DW144 (SPECIFICATION FOR SHEET METAL DUCTWORK 1998) FOR MEDIUM PRESSURE SYSTEM ON MYG-130 SLIDE ON FLANGE DUCT JOINTING SYSTEM (CLASSIFICATION TO TMI 1987)

DATE : 8, 21 MAY 2009
TESTED BY : Mr. WILSON LEUNG & Mr. YALE WANG (CSL)
REPORT BY : Mr. YALE WANG (CSL)
SPONSOR OF TEST : MYG INTERNATIONAL LTD.
TEST LOCATION : MYG FACTORY, WANGSHA CENTRAL ROAD, LANGSHA INDUSTRIAL AREA, QIAOQI TOWN, DONGGUAN CITY, PRC

For A 15F, Wilson Commercial Building, 22-24 Pat Avenue, Tsui Sha Tsui, Kowloon, Hong Kong
字樓: 香港九龍彌敦道22-24號匯豐商業大廈15樓A室
Tel 傳真 (852) 2528 2623 Fax 傳真傳真 (852) 2887 8384 Email 電郵 info@shillinglaw.com.hk

1. INTRODUCTION

Campbell Shillinglaw Lau Limited were commissioned by MYG International Ltd. to carry out duct deflection behavior and air leakage test on their MYG-130 slide on flange duct jointing system in accordance with DW144 (specification for sheet metal ductwork 1998) and TMI (1987).

2. TEST APPARATUS

- The Test apparatus consists primarily of the followings:
 - A centrifugal flow fan
 - A bypass damper
 - A U-tube manometer giving readings of the differential pressure between the sheet metal duct assembly and the ambient.
 - A flexible hose connecting the connecting the fan-duct assembly to the sheet metal duct.
 - A dial gauge giving readings of 0.01mm resolution and a maximum traverse of 25mm.
 - An Electronic Manometer LMI measures and digitally displays the duct pressure and the corresponding inlet flowrate to sustain the duct leakage.

The overall experimental set up is as shown in 09064G, 09064D and the detail set up for the deflection measurement is as shown in 09064K.

3. TEST SAMPLE

The test specimens of the following dimension, 09064C, were constructed:
Specimen: 2480mm(L) x 1600mm(W) x 550mm(H)
(Rated to 24 medium pressure)

The test sample consists of a rectangular duct (1.0mm thick) which was fabricated by Pittsburg lock seam, 09064H, and ready for duct section assembly.

The MYG-130 flange (09064M) was made by an ACL machine. The production detail and assembling of the flange are described in appendix I.

The MYG-130 slide on flange was fastened to the duct section to form a cross joint by spot welding at 50mm from corners and 300mm o.c. for the rest. Configuration of the flange joint, the sheet metal duct and the G-clamp are as shown in 09064N.

4. RESULTS

4.1 Test Result of deflection

| Dial Gauge Reading | Specimen | Pressure Pa | | | | | Calculated deflection @ 1000 Pa (mm) | Allowable deflection width/200 (mm) | |
|--------------------|----------|-------------|-----|-----|-----|-----|--------------------------------------|-------------------------------------|-----|
| | | 0 | 2.4 | 5.0 | 6.4 | 5.0 | | | |
| 1000 | | 2.4 | 5.0 | 6.4 | 5.0 | 2.6 | 0.2 | 4.9 | 6.4 |

N.B. The allowable deflection is in accordance to TMI and equal to 1/250 of width.

4.2 Test Result of air leakage

| Duct Size WxH (mm) | Pressure (Pa) | Square Ann (Sq. Meter) | Test Leakage (L/Sec/Sec) | Max. Allowed Leakage (L/Sec/Sec) |
|--------------------|---------------|------------------------|--------------------------|----------------------------------|
| 889 x 550 | 1000 | 19.73 | 1.96 | 3.14 |

N.B. The allowable air leakage is in accordance to TMI and equal to 40% of maximum permitted loss for the appropriate pressure class, as indicated in Table 17 of DW/144.

5. CONCLUSION

As shown in section 4 "Results", test specimen does not exceed the deflection and air leakage requirement of DW144 (specification for sheet metal ductwork 1998) and TMI (1987) as stipulated.

CHECKED BY: *Leslie Lau*
Leslie Lau
For and on behalf of
Campbell Shillinglaw Lau Ltd.

APPENDIX I

Pittsburg Lock Seam for Duct

MYG FLANGE JOINT DUCT SYSTEM

MYG - 120 (SCREW: M8 x 20)
MYG - 130 (SCREW: M10 x 25)
MYG - 140 (SCREW: M12 x 28)

SEALANT LOCATION

FASTENED BY SPOTWELD

MYG-130' FLANGE FIXED WITH SPOT WELD SPACED BY 300mm O.C.

40mm x 40mm x 4mm ANGLE STIFFENER FIXED WITH SPOT WELD SPACED BY 150mm O.C.

DIAL GAUGE SUPPORTED FROM CHANNEL

TEST JOINT (MYG-130)



Flange Joint System Testing Report

Model:M-140

Campbell Shillinglaw Lau Ltd
金寶聲學環保顧問有限公司

Our Ref: CSL19-201010901R_1a

REPORT ON DEFLECTION OF DUCTWORK TEST

TO
DW144 (SPECIFICATION FOR SHEET METAL DUCTWORK 1998)
FOR MEDIUM PRESSURE SYSTEM
ON
MYG-140 SLIDE ON FLANGE SYSTEM & STIFFENER SYSTEM
(CLASSIFICATION TO TM1)

DATE : 1ST SEPTEMBER 2010
TESTED BY : MR. WILSON LEUNG (CSLL)
REPORT BY : MR. LESLIE LAU (CSLL)
SPONSOR OF TEST : MYG INTERNATIONAL LIMITED
TEST LOCATION : MYG FACTORY
WABHA CENTRE ROAD
LANGSHI INDUSTRIAL AREA
QIAO TOU TOWN
DONG GUAN CITY
PRC

Plot A 15/F, Valiant Commercial Building, 22-24 First Avenue, Tsim Sha Tsui, Kowloon, Hong Kong
香港九龍尖沙咀彌敦道22-24號志強商業大廈15樓A字
樓電話: (852) 2728 2823 Fax: 傳真號碼: (852) 2867 0364 Email: 電郵: info@shillinglaw.com.hk

1. INTRODUCTION

Campbell Shillinglaw Lau Limited were commissioned by MYG International Limited to carry out duct deflection behavior test on their MYG-140 slide on flange stiffener and flange joint system in accordance with DW144 (Specification for Sheet Metal Ductwork, 1998) and TM1.

2. TEST APPARATUS

a) The Test apparatus consists primarily of the followings:-

- i) a centrifugal flow fan,
- ii) a bypass damper,
- iii) A U-tube manometers giving readings of the differential pressure between the sheet metal duct assembly and the ambient,
- iv) a flexible hose connecting the connecting the fan-duct assembly to the sheet metal duct.
- v) a dial gauge giving readings of 0.01mm resolution and a maximum traverse of 50mm.

The overall experimental set up is as shown in 100901A-1 and 100901A-2 and the detail set up for the deflection measurement is as shown in 100901B.

3. TEST SAMPLE

The test specimen of the following dimension, 100901C, were constructed:

Specimen: 2540 mm (L) x 4000 mm (W) x 1000 mm (H), tie rod used on the mid-span of duct flange system and duct stiffener system (Rated to 36 medium pressure)

The test sample consists of a rectangular duct (1.2 mm thick) which was prefabricated by pittsburg lock seam, 100901D, and ready for duct section assembly.

The MYG-140 flange was made by a ACL machine (100901E). The corner piece used to connect the flange is shown in Appendix I.

The MYG-140 slide on flange was fastened to the duct section to form a cross joint by spot welding details as follows:

- 1. Duct flange system using the spot welding at 50mm from corners and 300mm O.C. for the rest.

- 2. Duct flange system using the spot welding at 50mm from corners and 300mm O.C. for the rest.

Configuration of the flange joint, flange stiffener, the sheet metal duct and the G-clamp are as shown in 100901E.

4. RESULTS

4.1 - Deflection Results at Flange Stiffener

| Dial Gauge Reading | Specimen | Pressure (Pa) | | | | | | Calculated Deflection (0 - 1000Pa) (mm) | Allowable Deflection Width / 250 (mm) | |
|--------------------|----------|---------------|------|-----|---------|------|------|---|---------------------------------------|------|
| | | 0 | 500 | 1k | over 1k | 1k | 500 | | | 0 |
| | | 0 | 1.75 | 5.3 | 5.72 | 5.31 | 1.92 | 0.1 | 5.26 | 5.30 |

4.2 - Deflection Results at Flange Joint

| Dial Gauge Reading | Specimen | Pressure (Pa) | | | | | | Calculated Deflection (0 - 1000Pa) (mm) | Allowable Deflection Width / 250 (mm) | |
|--------------------|----------|---------------|------|------|---------|------|------|---|---------------------------------------|-----|
| | | 0 | 500 | 1k | over 1k | 1k | 500 | | | 0 |
| | | 0.14 | 3.78 | 5.98 | 6.29 | 5.78 | 3.70 | 0 | 5.81 | 8.0 |

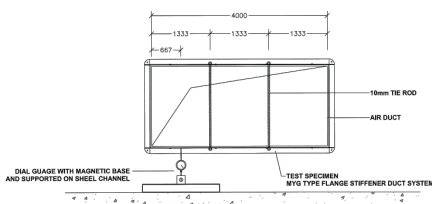
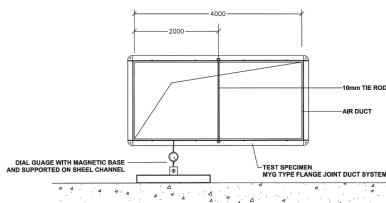
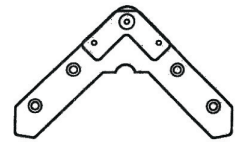
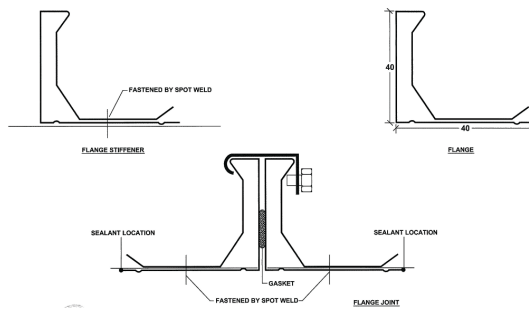
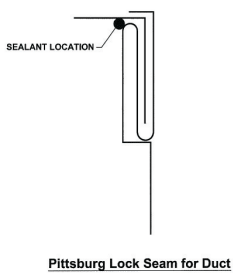
N.B. The allowable deflection is in accordance to TM1 and equal to 1/250 of width or where tie rods are used, 1/250 of span between central tie rod and the side of the duct.

5. CONCLUSION

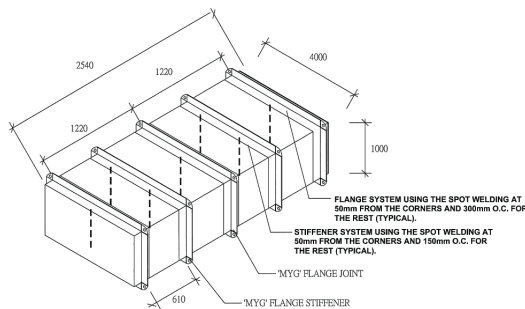
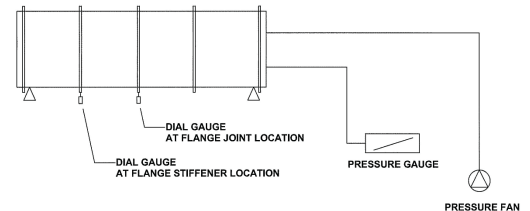
As shown in "Section 4 Results", deflection at flange joint and flange stiffener did not exceed the requirement of TM1 as stipulated.

TEST AND REPORT BY

Leslie Lau
Leslie LAU
For and on behalf of
Campbell Shillinglaw Lau Ltd.



'MYG' FLANGE STIFFENER & FLANGE JOINT DUCT SYSTEM





LOW PRESSURE (Limited to 500 Pa Positive and 500 Pa negative)

| Maximum duct size | | 400 | 600 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3000 |
|-------------------|-------|---|------|------|------|------|------|------|------|------|
| Minimum sheet | | 0.6 | 0.8 | | | 1.0 | | | | 1.2 |
| Flange Rating | Sheet | Maximum spacing between joints and stiffeners | | | | | | | | |
| M-120 | P.S | 3000 | 2000 | 1600 | 1250 | 625 | | | | |
| | S.S | 3000 | 3000 | 1600 | 1250 | 625 | | | | |
| M-130 | P.S. | 3000 | 2000 | 1600 | 1250 | 1000 | 800 | | | |
| | S.S | 3000 | 3000 | 2000 | 1600 | 1250 | 800 | | | |
| M-140 | P.S | 3000 | 2000 | 1600 | 1250 | 1000 | 800 | 800 | | |
| | S.S | 3000 | 3000 | 2000 | 1600 | 1250 | 1000 | 800 | | |
| M-140+Tie Rod | P.S | 3000 | 2000 | 1600 | 1250 | 1000 | 800 | 800 | 800 | 625 |
| | S.S | 3000 | 3000 | 2000 | 1600 | 1250 | 1000 | 800 | 800 | 800 |

MEDIUM PRESSURE (Limited to 1000 Pa Positive and 750 Pa negative)

| Maximum duct size | | 400 | 600 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3000 |
|-------------------|-------|---|------|------|------|------|------|------|------|------|
| Minimum sheet | | 0.6 | 0.8 | | | 1.0 | | | | 1.2 |
| Flange Rating | Sheet | Maximum spacing between joints and stiffeners | | | | | | | | |
| M-120 | P.S | 3000 | 1250 | 1250 | 625 | | | | | |
| | S.S | 3000 | 1600 | 1250 | 625 | | | | | |
| M-130 | P.S. | 3000 | 1600 | 1250 | 1000 | 800 | 800 | | | |
| | S.S | 3000 | 3000 | 1600 | 1250 | 1000 | 800 | | | |
| M-140 | P.S | 3000 | 1600 | 1250 | 1000 | 800 | 800 | 800 | 625 | |
| | S.S | 3000 | 3000 | 160 | 1250 | 1000 | 800 | 800 | 800 | |
| M-140+Tie Rod | P.S | 3000 | 1600 | 1250 | 1000 | 800 | 800 | 800 | 800 | 625 |
| | S.S | 3000 | 3000 | 1600 | 1250 | 1000 | 800 | 800 | 800 | 800 |

HIGH PRESSURE (Limited to 2000 Pa Positive and 750 Pa negative)

| Maximum duct size | | 400 | 600 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | |
|-------------------|-------|---|------|------|------|------|------|------|------|--|
| Minimum sheet | | 0.6 | 0.8 | | | 1.0 | | 1.2 | | |
| Flange Rating | Sheet | Maximum spacing between joints and stiffeners | | | | | | | | |
| M-120 | PS/SS | 3000 | 1250 | 800 | | | | | | |
| M-130 | PS/SS | 3000 | 1250 | 1250 | 1000 | 800 | | | | |
| M-140 | PS/SS | 3000 | 1250 | 1250 | 1250 | 800 | 800 | 625 | | |
| M-140+Tie Rod | PS/SS | 3000 | 1250 | 1250 | 1250 | 800 | 800 | 800 | 625 | |