



## **Fujian Jumbo New Material Corporation Limited**

**Industrial Zone, Changshan Overseas Chinese Economic Development Zone,**

**Zhangzhou, Fujian, China.**

**Report Reference: IA16-207\_Version 2**

**Date: 27 August 2018**

### **ASSESSMENT ON FIRE RESISTANCE OF GYPSUM BLOCK WALL WITH 150 mm THICK**

#### **Introduction**

We are requested by Fujian Jumbo New Material Corporation Limited to provide an assessment for variations of non-loadbearing gypsum block wall with 150 mm thick. This report presents an appraisal of fire resistance performance of non-loadbearing gypsum block wall using "Jumbo" gypsum blocks at the particular supporting structure as tested and recorded in the testing reports numbered IT16-186. The proposed gypsum block wall is required to achieve a performance of 240 minutes integrity and insulation in according to BS EN 1364-1:1999 or BS 476: Part 22: 1987, subjected to stated conditions.



## 1. Assumptions and Limitations

It is assumed that the proposed assembly will be installed to a suitable fire resisting structure, such as a masonry or reinforced concrete structure, which can provide the required supporting fire resistance period. The materials and constituents of the proposed assembly are in a similar manner and quality as tested or otherwise appraised by Forte Testing and Consultants Company Limited (FORTE). This assessment may only be reproduced in full by the applicant.

## 2. Background

### 2.1 FORTE Test Report No. IT16-186

A fire resistance test was conducted by FORTE in accordance with BS EN 1364-1: 1999 on a non-loadbearing gypsum block wall with “Jumbo” blocks of overall size 3000 mm (width) x 3040 mm (height), to determine its fire resistance performance. The test sponsor was Fujian Jumbo New Material Corporation Limited. Each “Jumbo” gypsum block was overall sized 600 mm (w) x 500 mm (h) x 80 mm (thick) with two tongue sides and two groove sides. All the blocks were joined by “Jumbo” premixed gypsum bonding adhesive, which was premixed bonding powder, of nominally 3-5 mm (t). The blocks were laid up to 3040 mm height with overlapping staggered joints. The gypsum block wall system was supported on three sides. The wall was tested with freedom of movement (Free edge) along one of its vertical edge. The 40 mm gap of free edge between the specimen and the support frame was sealed with mineral fibre. The specimen satisfied the integrity and insulation of 241 minutes. The test was terminated after the heating period of 242 minutes. Full constructions details of the specimen and the test results were recorded in the FORTE test report numbered IT16-186.

---



### 3.2 Gypsum block wall system with 240 minutes integrity and insulation in accordance with BS 476: Part 22

The proposed “Jumbo” gypsum block wall system with 80 mm thick can provide not less than 240 minutes integrity and insulation performance in accordance with BS 476: Part 22: 1987.

After detailed review of the test methods, BS 476: Part 22 and BS EN 1364-1, a summary of the primary differences of the test method is presented in Table 1.

Table 1- Gap Analysis between BS 476: Part 22 and BS EN 1364-1

<i>Item</i>	<i>BS 476: Part 22</i>	<i>BS EN 1364-1</i>
<b>Furnace Thermocouple</b>	Metal sheathed thermocouple	Plate thermocouple
<b>Furnace pressure</b>	Neutral pressure plane at 1000 mm	Neutral pressure plane at 500 mm
<b>INTEGRITY:</b>		
<b>Sustained flaming</b>	Not less than 10 seconds	More than 10 seconds
<b>Cotton pad</b>	Applied for 10 – 15 seconds	Applied for 30 seconds
<b>Gap gauges</b>	Employed after 5 minutes : 6 mm X 150 mm (other than at sill level); and 25 mm dia. for any gap	Employed after 5 minutes : 6 mm X 150 mm (other than at sill level); and 25 mm dia. for any gap
<b>Deflection measurement</b>	Monitor lateral deflection.	Deformation measurements to be made at specified locations.
<b>Direct field of application</b>	Not included.	Included.
<b>Insulation</b>	A failure of the specimen to maintain insulation shall be deemed when: a) mean unexposed face temperature increases by more than 140°C above its initial value; or b) the temperature recorded at any position on the unexposed surface by thermocouples is in excess of 180°C above the initial mean unexposed face temperature; or c) integrity failure occurs.	A failure of the specimen to maintain insulation shall be deemed when: a) mean unexposed face temperature increases be more than 140°C above its initial value; or b) the temperature recorded at any position on the unexposed surface by thermocouples is in excess of 180°C above the initial mean unexposed face temperature; or c) integrity failure occurs.



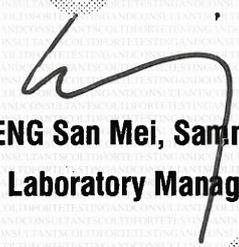
#### 4. Assessment/Conclusion

It is concluded that the “Jumbo” gypsum block wall system with 150 mm thick with the density up to  $1200\text{kg/m}^3 \pm 5\%$ , as shown detailed in Section 3 of this report will also achieve the fire resistance of not less than 240 minutes integrity and insulation if test in accordance with BS EN 1364-1: 1999 or BS 476: Part 22:1987, subjected to stated conditions.

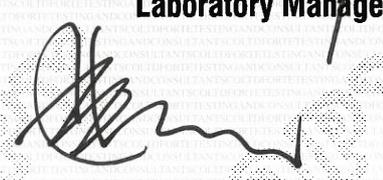
#### 5. Term of validity

This assessment is issued on the basis of test data and information to hand at the time of issue, and is valid only if presented with proper test evidence(s) and all noted supporting data. If contradictory evidence becomes available to FORTE, the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence over an expressed opinion. This assessment will expire on 12 October 2021, which time it is recommended that it will be submitted to FORTE for re-appraisal. This assessment is not valid unless it incorporates the declaration duly signed by the applicant.

**For and on behalf of FORTE Testing and Consultants Company Limited:**



**CHENG San Mei, Sammi**  
**Laboratory Manager**



**Ir. Dr. CHAN Yuk Kit, RPE (Fire)**  
**Managing Director**

## 6. Declaration by the applicant

- We the undersigned confirm that we have read and complied with the obligations placed on us by this guide on undertaking assessments.
- We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the standard against which this assessment is being made.
- We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the standard against which this assessment is being made.
- We are not aware of any information that could affect the conclusions of this assessment.
- If we subsequently become aware of any such information we agree to ask FORTE to withdraw the assessment.

Name: \_\_\_\_\_

Signed: \_\_\_\_\_

For and on behalf of : \_\_\_\_\_