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FIRE PROTECTION COMMAND**

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(24 小時 Hours)

12 March 1997

FSD Circular Letter No. 2/97
Discharge Tests for Total Gas Flooding System

According to the advice given by the Director of Environmental Protection, imports for halons have been banned from January 1994. As a result, different types of fixed gas flooding systems, such as FM200 and NAFSIII have been introduced for use in building fire protection.

This Circular Letter stipulates the agreement reached by the Working Group of Fire Service Installations Inspection Procedures on the installation and testing of these systems. With immediate effect, the practical discharge test of fixed gas flooding system with pressure not more than 25-bars may be dispensed with if:-

- (a) (i) the pipework of the gas flooding system are fixed and pneumatically tested in accordance with the details in the attached "Guide for Pipe Fixing & Pneumatic Test of 25-bar Fixed Gas Extinguishing System"; and
 - (ii) the system are designed according to an engineered computer programme approved by a recognized approving organization as listed in Part III of F.S.D. Circular Letters,
- or
- (b) the systems are modular or pre-engineered type and installed in accordance with manufacturer's specifications.

In both cases, a 'puff test' to the installed pipework as detailed in the attached Guide shall be carried out at the time of FSI inspection. If the above conditions cannot be met, a practical discharge shall be conducted in the same manner as a CO₂/Halon system as prescribed in Appendix I to the Code of Practice for Inspection and Testing of Installations and Equipment.

As the above arrangement will be applicable to all types of low pressure fixed gas flooding system, the details in my Circular Letter no. 3/90 dated 23.2.1990 on the discharge test of 25-bar fixed halon extinguishing system is hereby cancelled.

Signed
(LAM Chun-man)
for Director of Fire Services

Guide for Pipe Fixing & Pneumatic Test of 25-bar Fixed Gas Extinguishing System

1. Introduction

This guideline is prepared for the use as guidance for system design engineers and Registered FSI Contractors. It covers general requirement for pipework fixings, i.e. supports, hangers, and bracings, and pneumatic test to pipings of gas flooding system not more than 25 bar. However, this does not preclude the use of other types of support as recommended by individual system manufacturer provided that they satisfy the system pressure/temperature requirement.

2. Fixings

- 2.1 The guides and clips shall be of mild steel, capable of fixing the pipe under all conditions of operation and service. They shall allow the expansion and contraction of the piping, and prevent excessive stress resulting from transmitted weight being induced into connected equipment. Pipe fixings shall be anchored to the building structure such as beams, columns, concrete walls or slabs, etc. In order to prevent longitudinal or lateral movement or sway where practical, riser piping shall be fixed independent of the connected horizontal piping. No gas piping shall be hung or fixed from other piping systems, e.g. water, air pipes etc.
- 2.2 Tremendous forces will exert on the system cylinder(s) and piping during discharge. Each section of piping shall be fixed to restrict both the vertical and lateral movement.
- 2.3 A support/hanger shall be installed within 1 metre from every discharge nozzle as well as any down stream section of pipework where flow direction changes. For those horizontal drop or rise pipes below 300mm in length, fixing may be omitted on that drop/rise pipe section. For double baffle nozzles, one fixing within 1 metre from the nozzles is also acceptable.

3. Spacing of Fixings

Generally no section of pipe shall be without a hanger/support or bracing. Maximum spacing between fixings and the sizes of fixing steel angles are as shown in Table 1 and Table 2 respectively.

Table 1 : Maximum spacing between pipe supports

Pipe size upto	Maximum spacing between supports
15mm	1.6m
20mm	1.8m
25mm	2.1m
32mm	2.7m
40mm	2.7m
50mm	3.0m
65mm	3.3m
80mm	3.6m
100mm	4.2m
150mm	5.2m

Table 2 : Sizes of fixing steel angles

Pipe size	Fixing steel angle size
15mm to 32mm inclusive	25 x 25 x 3mm
40mm and 80mm inclusive	32 x 32 x 3mm
100mm and 150mm inclusive	50 x 50 x 6mm

4. Reference Drawings

The following drawings are produced to illustrate some typical pipe hangers and supports welding for design engineers and Registered FSI Contractors reference.

<u>Drawing No.</u>	<u>Title</u>
1	Typical Pipe Hangers
2	Pipe Support Welding

5. Pneumatic Test

5.1 The piping shall be pneumatically tested in a closed circuit for a period of 10 minutes at a pressure not less than 10 bars. At the end of 10 minutes, the pressure drop shall not exceed 10 percent of the test pressure. When pressurizing the piping, pressure shall be increased in 3.5 bar increments.

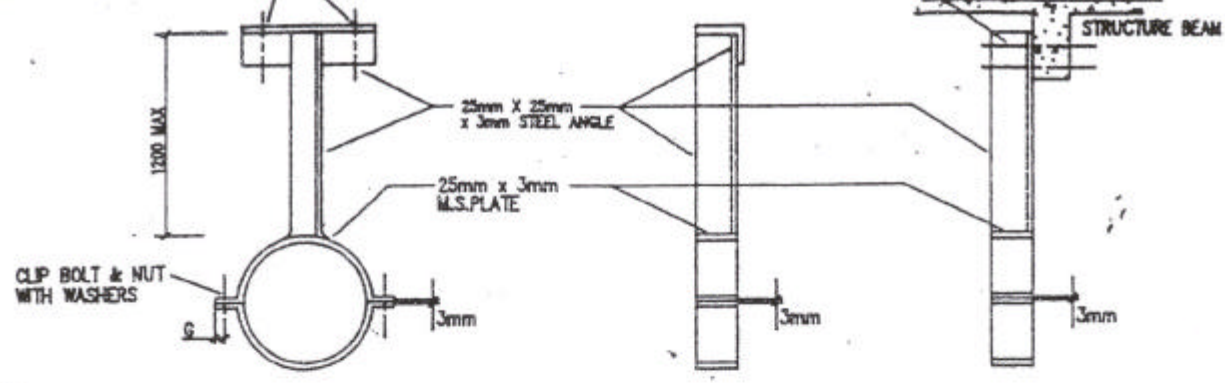
- 5.2 The pressure test may be omitted if the total piping contains no more than one change in direction fitting between the storage container and the discharge nozzle, and where all piping is physically checked for tightness.
- 5.3 The test is to be carried out by Registered FSI Contractor after the installation and a certificate for such test to be submitted to FSD for record.

6. 'Puff' Test

- 6.1 A 'puff test' shall be carried out in accordance with clause no. 4.7.2.2.13 of NFPA 2001 at the time of FSD inspection. The purpose is to conduct a flow test of short duration through the pipework to determine that :-
 - a. the flow is continuous;
 - b. check valves are properly oriented; and
 - c. the piping and nozzles are unobstructed
- 6.2 The flow test should be performed using gaseous nitrogen or an inert gas at a pressure not to exceed the normal operating pressure of the gas flooding system.
- 6.3 The nitrogen or an inert gas pressure should be introduced into the piping network at the clean agent cylinder connection. The quantity of nitrogen or an inert gas used for this test should be sufficient to verify that each and every nozzle is unobstructed.
- 6.4 Visual indicators should be used to verify that nitrogen or an inert gas has discharged out of each and every nozzle.

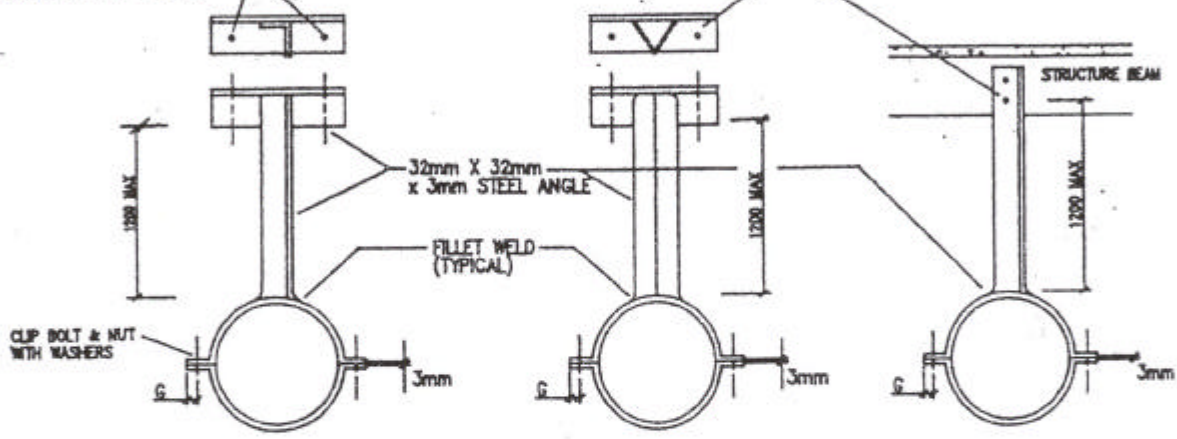
PIPE HANGER FOR #15mm - #32mm

1 x 12mm DIA. HOLE WITH 10mm ANCHOR BOLT & WASHER



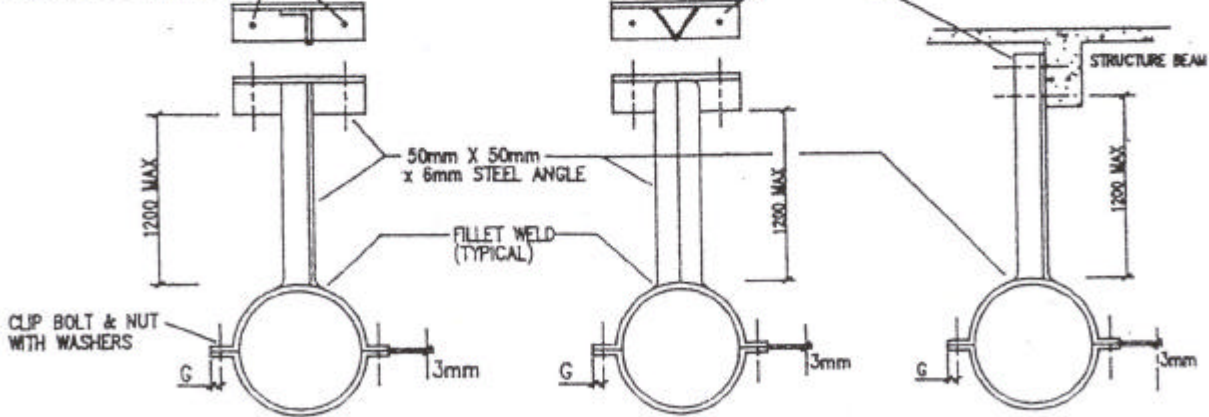
PIPE HANGER FOR #40mm - #80mm

2 x 12mm DIA. HOLE WITH 10mm ANCHOR BOLT & WASHER



PIPE HANGER FOR #100mm - #150mm

2 x 20mm DIA. HOLE WITH 16mm ANCHOR BOLT & WASHER



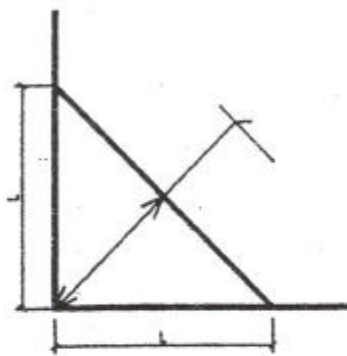
BOLTS & NUTS ARE TO BE HEX HEAD

CLIP #	CLIP BOLT (Ø)	DIA. OF HOLE DRILLED	G
15 mm - 32 mm	6 mm	8 mm	10 mm
40 mm - 80 mm	8 mm	10 mm	15 mm
100 mm - 150 mm	10 mm	12 mm	15 mm

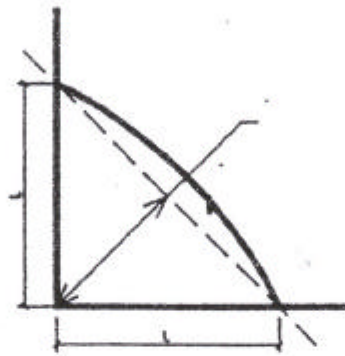
TITLE
TYPICAL PIPE HANGERS

DRAWING
1

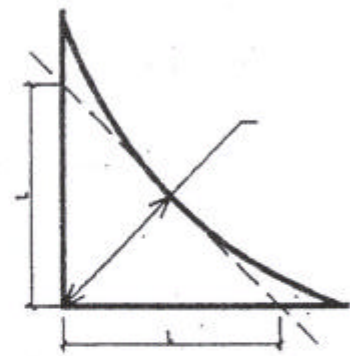
IN THE FOLLOWING DIAGRAMS THE RECOMMENDED PRACTICE ARE INDICATED.



(A) FLAT



(B) CONVEX



(C) CONCAVE

FILLET WELD JOINING TWO NUMBERS AT RIGHT ANGLES ARE CONSIDERED TO BE 45° , BUT THE WELD FACE MAY BE MITRED OR FLAT, CONVEX AND CONCAVE. IN NO CASE, L CAN BE LESS THAN THE THICKNESS OF MATERIAL.

TITLE

PIPE SUPPORT WELDING

DRAWING

2