Chinese Fire Protection Safety Center Fire Protection Equipment Laboratory

Fire Extinguisher Test Report

Client: APLUS MOLDS & PLASTICS CO., LTD
Model: 5LBI14
Report Date: June 30, 2015

Fire extinguisher Test Report

Application No: C104-034

Client: APLUS MOLDS & PLASTICS CO., LTD.

Address: No. 63, Lane 350., Jhong Jheng Rd., Yong Kang Dist., Tainan City 71043, Taiwan.

Date of Authorization: June 9, 2015

Report Source: Chinese Fire Protection Safety Center

Tel: 03-3222550

Laboratory Address: 5F, No. 51, Housheng Rd., Luzhu, Taoyuan City 338, Taiwan(R.O.C.)

Testing Laboratory: Fire Testing Laboratory

Test site: (fire-refuge) No.48, Ln. 156, Xinyi Rd., Guanyin Dist., Taoyuan City 328, Taiwan (R.O.C.)

Test part: Fire extinguisher

Model: 5LBI14

Manufacturer: APLUS MOLD & PLASTICS CO., LTD

Received Date: June 9 , 2015

Test Date: June 9, 2015 – June 14, 2015

Test Method: Fire Extinguisher Approval Standard【Ministry of the Interior granted Number 1020823751 on July 19, 2013】

- ■ Extinguishing Performance Test (A-2)
- ■ Discharging performance test
- ■ Impact Test for Cylinder
- ■ Extinguishing agent leakage test
- ■ nozzle
- □ pressurized gas cartridge
- □ operating mechanism View
- □ Anti-corrosion and anti-rust processing test Note 1
- □ Cylinder thickness test
- ■ gap, plug, fill cap and gasket
- ■ hose
- ■ impact test
- □ pressure gauge test
- □ vibration test Note 1
- □ operating temperature test
- ■ Valve

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Inspection Engineer: 工程師莊家儀 Laboratory director: 組長洪文傑 Report signed by: 副執行長洪嘉飛

Form number: CFS-4-19-9

Fire extinguisher Test Report

Test item: Extinguishing efficiency value Test

Test basis: Fire Extinguisher Approval Standard, Chapter one Section four、Chapter one Section thirty-five Table10 to Table 13, promulgated by NFA.

Test method: Test requirements following chart 1

Test result: Test results following chart 1

Sample number	Standard requirement	Test result
II	A-2	After discharging all of the extinguishing agent, the flame shall be extinguished and there shall be no reoccurrence of the flame within 2 minutes.

Fire extinguisher Test Report

Test item: Discharging performance Test

Test basis: Fire Extinguisher Approval Standard, chapter 1, and section 9, promulgated by NFA.

Test method:

(1) During operating, the extinguishing agent could be discharged quickly and effectively.

(2) Discharging duration lasts over 10 seconds at 20°C.

(3) Effective discharging distance for extinguishing the fire.

(4) Able to discharge all of the extinguishing agent or over 90% of extinguishing agent.

Test result:

Sample number	Standard requirement			Test result		
	Distance	Duration	Discharging percentage	Distance	Duration	Discharging percentage
I	≧ 3 m	≧ 10 s	≧ 90 %	≧ 3 m	11''997 s	94.8 %

Fire extinguisher Test Report

Test item: Impact Test

Test basis: Fire Extinguisher Approval Standard, chapter 1, and section 19, promulgated by NFA.

Test method:

When the fire extinguisher drops accidentally during operation or being carried, it should be able to withstand the impact. The extinguisher should be made of the materials with durability and rigidity.

Test result:

Sample number	Standard requirement	Test result
I	Not inoperable and unmovable. No damage, crack on the cylinder. No parts falling off.	Not inoperable and unmovable. No damage, crack on the cylinder. No parts falling off.

Fire extinguisher Test Report

Test item: Extinguishing agent leakage test

Test basis: Fire Extinguisher Approval Standard, chapter 1, and section 20, promulgated by NFA.

Test method:

Fire extinguisher should have anti-leakage equipment to prevent the extinguishing agent from leaking caused by elevated temperature or vibration. If leakage is of no concern, it is not necessary to conduct the test.

Test result:

Sample number	Standard requirement	Test result
I	No leakage of agent	No leakage of agent

Fire extinguisher Test Report

Test Item: Pressure test for cylinder

Test basis: Fire Extinguisher Approval Standard, Chapter One, and Section Twelve, promulgated by NFA.

Test Method:

Pressure test for cylinders should follow the chart below. After the extinguisher is pressurized in the water for five minutes, no leakage and deformation are allowed, nor could it cause deformation of the perimeter over 0.5% permanently.

Fire extinguisher type	Non anti-corrosion material		Note
	Stored Pressure	Pressurized	
water extinguisher	2.5 times stored pressure	---	water extinguisher
foam extinguisher	2.5 times stored pressure	36 kgf/cm^2	foam extinguisher
carbon dioxide extinguisher	250 kgf/cm^2	---	carbon dioxide extinguisher
dry chemical extinguisher	2.5 times stored pressure	36 kgf/cm^2	dry chemical extinguisher

Test Result:

Sample number	Standard requirement	Test result
I	≦ 5%	0.0%

Fire extinguisher Test Report

Test Item: caps, plugs, fill cap and gaskets

Test basis: Fire Extinguisher Approval Standard, Chapter One, and Section Thirteen, promulgated by NFA.

Test Method:

(1) Between the cap、plug and fill cap, the gasket should be fitted with no concern of falling out.

(2) When the cap and plug undergo the pressure test based on Rule 12, leakage and notable deformation are not allowed

(3) For the fitting part of the cap or plug, the fitting of the gasket should be done accurately and can be distinguished from the cylinder. When the pressure test is conducted, they are able to withstand the pressure and the fitting is rigid on the fill cap.

(4) When the cap or plug needs to be removed while filling the extinguishing agent, a pressure releasing hole or drain should be included to release the pressure in the cylinder. The cap and the plug should withstand the pressure before pressure starts to decrease.

(5) The gasket should not be corroded by the extinguishing agent. When the fire extinguisher is used at working temperature, it could not affect the performance of the fire extinguisher.

Test Result:

Sample number	Standard requirement	Test result
I	Compliance with the construction. No leakage and deformation during pressure test.	Meet standard requirement

Fire extinguisher Test Report

Test Item: Valve

Test basis: Fire Extinguisher Approval Standard, Chapter One, Section Fourteen ,promulgated by NFA.

Test Method:

(1)The Valve of the fire extinguisher should follow the rules below:

1. Except for the valve mentioned on the Rule (two), no leakage and notable deformation are allowed for the other valves during pressure test.
2. A Hand rotated valve (rotary knob type) shall be constructed to be opened with not more than 1-1/4 turns.
3. When the valve is opened, it shall not detach or fall off.

(2) It shall apply to CNS 12242 (seamless steel high-pressure gas) of the stored pressure extinguishers and pressurized gas fire extinguisher (except actuated closing plate). It shall apply to CNS 11176(cylinder safety valves for carbon dioxide, Halogenated burn and dry powder fire extinguishers and damaging board) standards, to set the cylinder valve and the valve should meet the following requirements:

1. Valve should use CNS4008 (brass rods), CNS11073 (copper and copper alloy sheet, roll film), CNS10442 (copper and copper alloy) or other standard of materials or with equivalent strength and corrosion resistance material.
2. The valve used for CO_2 fire extinguishers or CO_2 expellant cartridges should withstand 250kgf / cm^2 For the others, while undertaking water pressure test, the valve shall be tested with container test pressure. No leakage and notable deformation are allowed after five minutes of water pressure.
3. Test the valve for five minutes with the same pressure inside the cylinder when it is at 40 °C, no leakage and notable deformation of the valve is allowed.
4. Safety valve should be installed.

Test Result:

Sample number	Standard requirement	Test result
I	1. The structure needs to match the drawing. 2. No leakage, parts falling off and cracking during discharging. 3. No leakage and deforming during water pressure test.	Meet standard requirement

Fire extinguisher Test Report

Test Item: Fire Extinguisher hose

Test Basis: Fire Extinguisher Approval Standard, Chapter One, and Section Fifteen, promulgated by NFA.

Test method:

(1) Fire extinguishers should have a hose. But it is applicable when the extinguishing agent of carbon dioxide extinguisher is below 4kgs, the extinguishing agent of dry powder extinguisher below 2kgs and the extinguishing agent of foam extinguisher is below 3 liters.

(2) The hose of the fire extinguisher should follow the rules below:

1. No leakage or deformation of the hose is allowed during pressure test based on Chapter one, Section twelve.
2. It should have enough length and inside diameter. Fire extinguishing agent shall be discharged effectively and it shall comply with Chapter One, Rule Thirty-five.
3. It should be durable and operate smoothly at the working temperature.

Note: The hose of carbon dioxide fire extinguisher shall comply with Rule thirty one, point 4.

Test Result:

Sample number	Standard requirement	Test result
I	1. The structure needs to match the drawing. 2. Effective discharging and no leakage and dysfunctions. 3. No leakage or deformation during water pressure test.	Meet standard requirement

Fire extinguisher Test Report

Test Item: Fire extinguisher nozzle

Test Basis: Fire Extinguisher Approval Standard, Chapter One, and Section Sixteen, promulgated by NFA.

Test method:

(1) The fire extinguisher nozzle could not install retractable and switch device (except wheel rack fire extinguisher). Back pack extinguisher or pressurized dry powder fire extinguishers can be equipped with retractable nozzle

(2) The nozzle of the fire extinguisher should follow the rules below:

1. The inner of the nozzle should be made smoothly.
2. Retractable nozzle or switch nozzle or switching operation shall be made smooth. No leakage or dysfunctions shall occur when the fire extinguishing agent is discharged.
3. For retractable nozzle, no leakage is allowed when taking water pressure test with 3kgf/cm^2 pressure for 5 minutes.
4. For the open nozzle with a plug, there should be no leaking and correct actuation at the working temperature.

Test Result:

Sample number	Standard requirement	Test report
I	1. The structure needs to match the drawing. 2. Effective discharging and no leakage and dysfunctions. 3. No leakage or deformation during pressure test.	Meet standard requirement