



October 1, 2011

SAFETY AND GOATTHROAT PUMPS

While no safety incidents have occurred to our knowledge from the use of GT Pumps with combustible or flammable liquids, OSHA 29 CFR1910.106 requires use of inert gas pressure when dispensing them.

That being said, the standard GoatThroat Pumps have been safely used for years with class 1 and class 2 flammable liquids such as methanol, ethanol, toluene, hexane, hexene, acetone, benzene, gasoline and numerous other flammable liquids. Although the standard GoatThroat Pumps cannot be grounded, users have determined that using these pumps with class 1 and class 2 flammable liquids create an environment which is substantially safe. Here is the reason why.

The materials used to make the standard GoatThroat Pumps are non-conductive and typically do not create or conduct static electricity under typical operating conditions. Ignition can only happen with the correct mixture of fumes and oxygen at the correct temperature with an electrical spark. When properly placed on a container, these safety pumps completely eliminate any VOCs (fumes) because they create a sealed system. Therefore, a GoatThroat Pump properly placed and sealed on a container of flammable liquid eliminates any ignition potential when the pump is not in use. When the pump's tap is opened, fluid can flow at a rate of up to 4.5 gallons per minute. This speed/volume within the pump system is insufficient to cause static buildup adequate to create an ignition potential. Since most fluids are dispensed at room temperature, 65 -75 degrees Fahrenheit, it is very difficult to achieve the perfect ignition situation with GoatThroat Pumps. It is recommended that users ground the metal container and thereby ground the liquid therein. For additional safety, some users have also used the standard pumps in specially built static free rooms.

Although standard GoatThroat Pumps have been safely used for years with class 1 and class 2 flammable liquids (GoatThroat has received no reports of ignition from any customer using these pumps and flammable liquids), some companies' safety programs recently have demanded that GoatThroat Pumps create a pump which meets their strictest safety guidelines for class 1 and 2 flammable liquids. These programs must meet NFPA77, Paragraph 6.4.1.3 which states: "To prevent the accumulation of static electricity in conductive equipment, the total resistance of the ground path to earth should be sufficient to dissipate charges that are otherwise likely to be present. A resistance of 1 megohm (106 ohms) or less is generally considered adequate."

Ensuring worker safety and environmental compliance has never been easier.





GoatThroat Pumps has now created a pump to meet new safety program demands: the SCP-6500. Components of the “6500” pump which come in contact with the liquid and each other are made of conductive plastic which meets the NFPA77, Paragraph 6.4.1.3 requirements. The “6500” pump is sent to customers with an attached 6-foot ground wire with alligator clips at the other end. For safe use, these pumps must be used with the appropriate o-ring seal, must be properly and securely attached to the vessel, and the pump’s ground wire must be grounded.

On the following pages are the test results for the SCP-6500 pump from Ciba Expert Services, the Safety Testing Laboratory of Ciba Geigy.

Regards,

Nancy Westcott
President

Best regards,

Nancy Westcott
President

Ensuring worker safety and environmental compliance has never been easier.



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Title:	Resistance Measurements of GoatThroat Pumps	
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CST Ref.:	105-08	Customer Ref.
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Report By:	M. Oliver	
Date:	October 9, 2009	

1. Summary

Three pump heads and four tubes made from various materials were tested to determine if they are static conductive.

NFPA 77, Paragraph 6.4.1.3: "To prevent the accumulation of static electricity in conductive equipment, the total resistance of the ground path to earth should be sufficient to dissipate charges that are otherwise likely to be present. A resistance of 1 megohm (10^6 ohms) or less is generally considered adequate."

Only the head and tube marked "conductive" met the criteria. With the other materials, only with the leads attached on opposite sides of the same ends of the tube could a resistance less than 100 teraohms be measured.



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2. Samples for testing

Material of construction	Sample Description
Regular	Head and Tube
Containing Irgastat	Head and Tube
Containing other antistat	Tube only
Conductive	Head and Tube

3. Test Equipment

Resistance measurements were made with the following electrometers

1. Fluke 1520 Megaohm Meter: Range =250 kilohms to 4000 megohms
2. Keithley 6517B High Resistance Meter. 200 kilohms to 100 teraohms.
3. Fluke 87 III True RMS Multimeter: Range = 0-40 megohms.

4. Test Results

Three pump heads and four tubes made from various materials were tested to determine if they were conductive. This was accomplished by measuring the resistance across several points. See pictures on the next page for depiction of test points.

Test	Description
A	Resistance from head to ground wire (lead attached to foil wrapped around head)
B	Resistance from ground wire on head to end of tube
C	Resistance across length of tube
D	Resistance across end of Tube

Table 1: Test Results

Test	A	B	C	D
Regular	>4 G ¹	>4 G ¹	> 100 T ²	30 T ²
Irgastat	>4 G ¹	>4 G ¹	> 100 T ²	1.0 T ²
Other Antistat	NA	NA	> 100 T ²	1.9 T ²
Conductive	78 K ³	80 K ³	4.7 K ³	900 ³

1. Fluke 1520 Megohm Meter.
2. Keithley 6517B High Resistance Meter.
3. Fluke 87 III True RMS Multimeter.

$$K = 10^3 \quad M = 10^6$$

$$G = 10^9 \quad T = 10^{12}$$

5. Test Description

Test A



Test C



Test B



Test D

