

**Document Summary**

<b>Detail Type</b>	<b>Detail</b>
IFB DGS	1408-019
Commodity	Fusees, Red, Automatic Ignition, 5 and 10 Minute
Attachment	2
Group-Class	13-01
Bid Specification	1390-2677
Revision Level	B
Revision Date	July 30, 2014
Agency Name	Statewide

**Revision History**

<b>Bid Spec</b>	<b>Rev Level</b>	<b>Revision Date</b>	<b>Author</b>	<b>Summary of Changes</b>
1390-2677	B	July 30, 2014	Wong, N Tarn, J	Bid development

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## 1.0 SCOPE

This specification covers automatic ignition red fusees used as emergency highway warning devices for the purpose of diverting traffic on highways and informing moving vehicle traffic to avoid hazardous traffic areas.

## 2.0 APPLICABLE LAWS and INDUSTRY STANDARDS

Specifications, standards and regulations referenced in this document in effect on the opening of the invitation for bid, form a part of this specification.

### 2.1 LAWS and REGULATIONS

None listed

### 2.2 INDUSTRY STANDARDS

Underwriters Laboratories Standard (UL) 912 Highway Emergency Signals, latest edition Sections 24 through 35 for fusees as well as conform to the additional requirements of this specification.

## 3.0 TECHNICAL REQUIREMENTS

### 3.1 GENERAL

3.1.1 Specified rated time for each fusee shall be either 5 or 10 minutes.

3.1.2 Automatic ignition fusees are dropped from a moving vehicle to mark hazardous traffic areas along the highway for the purpose of controlling and informing traffic to avoid hazardous traffic areas.

3.1.3 The auto-igniter coupler is connected to a vertically mounted drop tube securely mounted to a vehicle. The fusee shall ignite when it is pushed through the auto-igniter coupler that is connected to the vehicle's 12-volt battery. This connection provides electrical current to a pair of conductive bars mounted within the inner wall of the auto igniter coupler.

3.1.4 The fusee must fall freely through the vertical drop tube and remain burning as it hits the deflector and rolls underneath the- moving vehicle. This creates a trail of burning fusees, marking the boundaries for hazardous traffic areas. The fusee must be capable of burning on dry and wet road surfaces and burn for the minimum time for which the fusee is rated.

### 3.2 CONFIGURATION

3.2.1 The base of the fusee shall be closed by means of a disc or plug. Any additional outer plastic wrapping for waterproofing, which must be removed before the fusee can be ignited, is not acceptable.

3.2.2 The head of the fusee shall be fully covered and protected with a tightly fitting cap with anti-roll device and a secured wire extending symmetrical through the cap for ignition. The diameter of the cap shall be less than one and a quarter inches. The entire rim of fusee head shall be free from ignition compound. The fusee cap shall be configured to direct the hot ignition gases and flames downwards while minimizing any back-flame, which could pose a hazard to the user. The fusee and cap shall be

designed so that when the fusee is ignited and dropped from a height of 7 feet, it shall burn for the specified rated time.

### 3.3 MATERIALS

All materials used in the make-up of the fuse shall be new and suitable for the use intended.

### 3.4 POTASSIUM PERCHLORATE

Fusees shall contain no potassium perchlorate.

### 3.5 WORKMANSHIP

The fuse shall be free from defects that will affect safety, appearance, or serviceability.

### 3.6 SPECIAL MARKINGS/REQUIREMENTS

In addition to markings required by UL 912, each fusee shall be marked with date (month and year) of manufacture, instruction for igniting the device, and the California State Office of the State Fire Marshal's seal of approval. Markings should also include, "Does Not Contain Potassium Perchlorate". All markings shall be legible.

### 3.7 HEALTH AND SAFETY CODE SECTION 12683

The fuse shall be approved for sale and use in the State of California by the State Fire Marshall's Office in accordance with the State of California Health and Safety Code Section 12683.

## 4.0 QUALITY ASSURANCE PROVISIONS

Fusees used for each individual test shall not be subjected to subsequent testing.

### 4.1 Anti-Roll Test

The fusee shall be dropped from a height of 30 inches  $\pm$ 3 inches, from the surface and shall not roll or slide more than 24 inches from the point of impact.  
(Requires two fusees for this test)

### 4.2 Water Immersion Test

Immerse the fusee in water at 25°C for 10 minutes. After 10 minutes, remove the fusee and promptly drop it through an auto igniter coupler attached to the vertical drop tube. The fusee shall ignite and burn for the specified rated time.  
(Requires two fusees for this test)

### 4.3 Fusee Ignition Test

Select five fusees and drop them through a truck mounted vertical drop tube with the attached auto igniter coupler while the truck is moving at a slow rate of speed. One hundred percent should ignite and roll toward the center of the traveled way and away from the truck's tires. If any of the fusees fail to ignite, test 10 more randomly selected fusees. Failure of any of these second fusees to ignite will be cause for rejection. Fusee off-spray from ignition shall be minimal with no harm to operator or clothing.

4.4 Burning Time

The fusee when ignited and placed in a horizontal position shall burn for the specified rated time as marked on the fusee and shall be tested in accordance to UL 912 Standard. Burn time shall be within the limit specified in Table 32.2 of the Standard.  
(Requires two fusees for this test)

4.5 Heat Test

The fusee shall withstand 48 hours in a forced draft over at 75°C without ignition or significant decomposition. The fusee shall be ignited and burn for the specified rated time as marked on the fusee upon completion of this test.  
(Requires one fusee for this test)

4.6 Color Test

The flame emitted from a lit fusee shall be red in color when viewed under daylight conditions.  
(Requires one fusee for this test)

4.7 Perchlorate Test

The fusee shall be tested for potassium perchlorate per UL 912, 34A.  
(Requires two fusees for this test)