



STATE OF CALIFORNIA

Bid Specifications Fusees, Red (without spikes) 15, 20, and 30 minute

1390-2677A

1. SCOPE

This specification covers red fusees (without spikes) intended to be carried on automotive vehicles for use as emergency highway traffic warning signals.

2. APPLICABLE SPECIFICATIONS

Specifications and standards referenced in this document in effect on the opening of the Invitation for Bid form a part of this specification.

3. REQUIREMENTS

A. General

- i. Specified rated time for each fusee shall be either 15, 20, or 30 minutes.
- ii. The fusees shall conform in all respects to the requirements of Underwriters Laboratories Standard (UL) 912 Highway Emergency Signals, latest edition Sections 24 thru 35 for Fusees as well as conform to the additional requirements of this specification.
- iii. The fusee shall be approved for sale and use in the State of California by the Office of the State Fire Marshal.
- iv. Fusees shall have an anti-rolling feature that shall meet the test requirements in Section 4 of this bid specification. This feature shall not create excess bulk such as to require additional storage space.
- v. There shall be no metal parts used in the fusees.
- vi. Fusees shall contain no potassium perchlorate.

B. Workmanship

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

C. Special Markings

In addition to marking required by UL 912 Section 35, each fusee shall be marked with instruction for use of the anti-roll device, date (month and year) of manufacture, 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.

4. QUALITY ASSURANCE PROVISIONS:

A. State Anti-Roll Test Requirement

The test surface shall be concrete or asphalt with a road surface roughness range from 0.3 to 0.55 coefficient of friction as determined by the California Department of Transportation Test 342 (Typical Road Surface). The test surface shall not be perceptibly out of flat and shall be at a 10° incline $\pm 2^\circ$ from the horizontal. The fusee

shall be dropped from knee height of twenty (20) inches, ± 3 inches, from the surface, and shall not roll or slide more than 24" from the point of impact.

B. Perchlorate Test: The fusee shall be tested for potassium perchlorate Per UL 912, 34A.

Bid Specifications
Fusees, Red, Automatic Ignition
5 and 10 minute

1. 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. SPECIFICATIONS AND STANDARDS

- A. Specifications and standards referenced in this document in effect on the opening of the Invitation for Bid form a part of this specification.
- B. The fusees shall conform in all respects to the requirements of Underwriters Laboratories Standard (UL) 912 Highway Emergency Signals, latest edition, Sections 24 thru 35 for fusees as well as conform to the additional requirements of this specification.

3. REQUIREMENTS

A. General

- i. Specified rated time for each fusee shall be either five (5) or ten (10) minutes.
- ii. 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.
- iii. 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.
- iv. 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.

B. Configuration: The automatic ignition fusees shall conform to all requirements specified below.

- i. 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.
- ii. 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 1 ¼ 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.

- C. Materials: All materials used in the make-up of the fuse shall be new and suitable for the use intended.
- D. Fusees shall contain no potassium perchlorate.
- E. Workmanship: The fuse shall be free from defects that will affect safety, appearance, or serviceability.
- F. 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.
- G. The fuse shall be approved for sale and use in the State of California by the State Fire Marshal's Office in accordance with the State of California Health and Safety Code Section 12683.

4. QUALITY ASSURANCE PROVISIONS:

A. SAMPLE TESTING

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

- i. Anti-Roll Test: The fusee shall be dropped from a height of thirty (30) inches, ± 3 inches, from the surface and shall not roll or slide more than 24" from the point of impact. (Requires 2 fusees for this test)
- ii. 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 2 fusees for this test)
- iii. Fusee Ignition: Select 5 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.
- iv. 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 2 fusees for this test)

- v. Heat Test: The fusee shall withstand 48 hours in a forced draft oven 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 1 fusee for this test)
- vi. Color Test: The flame emitted from a lit fusee shall be red in color when viewed under daylight conditions. (Requires 1 fusee for this test)
- vii. Perchlorate Test: The fusee shall be tested for potassium perchlorate per UL 912, 34A. (Requires 2 fusees for this test)

