

# Pyrotechnic Compositions

**SIMPSON**  
A Norican Technology

## Simpson Pyrotechnic Muller

The modern Simpson Mix-Muller® is the product of many years of close cooperation with leading pyrotechnic manufacturers worldwide. Typically used in the production of explosive, tracer, pyrotechnic igniter, delay, illuminating and smoke compositions the Simpson Mix-Muller® is available with many optional features in addition to those normally provided, and specified herein.

Please don't hesitate to request or suggest design modifications to the standard equipment. As a longtime supplier to the pyrotechnic industry, Simpson Technologies Corporation desires to continue to supply equipment and services which are the best of their respective kind, and in conformance with modern industry practices.

### **Illuminating Compositions**

These compositions consist of a finely divided metal, an oxidizer and a binder. The usual metals employed are magnesium and aluminum, or any alloy of the two. Sodium nitrate is commonly used as the oxidizer. Paraffin, used as a binder in older formulations, has been largely replaced by synthetic resins. The newer binders used in illuminating compounds usually consist of a synthetic resin, a polymerization agent, and a catalyst. The mixing of illuminants is one area where special Simpson Multi-Mulls have been successfully used to continuously mix pyrotechnic materials prior to pelletizing.

### **Flare Compositions**

Flare compositions are designed to produce white and colored light in various signaling devices. A typical flare formula is that used to produce the red flare. It consists of potassium perchlorate, strontium nitrate, magnesium coated with paraffin, hexachlorobenzene and gilsonite.

### **Smoke Compositions**

These pyrotechnic signal compositions are designed to burn to produce as much smoke as possible. Burning usually take place less energetically than with other types of pyrotechnics because at lower temperatures less of the solid smoke particles are consumed. Smokes are usually mixed in two stages: in a premix of retardant and oxidizers, to which the fuel, dyes and volatile solvents are added.

### **Delay Compositions**

Delay compositions are used to delay the detonation of explosive devices. Delay compositions commonly used are the so-called gasless type, consisting of a metal as a fuel SIMPSON Report (88/01) Page 3 and chromates as the oxidizer. Delay work is normally very hazardous in that very sensitive igniters are usually required. Mixing operations are normally performed using remotely controlled mixers installed behind adequate shielding.