MALLEABLE SOLID EXPLOSIVE AND METHOD FOR OBTAINING IT

The present invention relates to a novel malleable solid explosive, which constitutes an alternative, or even an improvement, to the plastic explosives known to date (see below). The invention also relates to a process for obtaining said novel malleable solid explosive.

The technical field of the invention is that of malleable (pasty) solid (blocks of) explosives, commonly known as plastic explosives, primed with a detonator, for military and civil use. They are generally used in the form of cakes of a few hundred grams. The malleability of these explosive cakes makes it possible to fully adapt their forms to the contours of the objects or structures to be destroyed.

The first plastic explosive known, under the name "gelignite", was invented by Alfred Nobel in 1875. It consisted of nitrocellulose dissolved in nitroglycerine and mixed with wood paste and potassium nitrite.

Plastic explosives composed of an explosive charge and a binder such as wax or mineral oil, which have the drawback of having degraded malleability properties under cold conditions, have also being described in the past. Patent application DE 20 27 ~~209–~~709 described, in 1971, a malleable explosive containing, in order to improve its cold plasticity, from 8% to 15% by weight of silicone oil as binder (said explosive also advantageously contains zinc oxystearate as additive). However, as the rheological qualities of these explosives remained insufficient, it appeared essential to condition said explosives, especially when they are used or stored as elements of a few hundred grams, in packages, in order to avoid their deformation by gravity. Thus, patent application DE 30 46 562 proposes explosives of this type incorporated into metal or plastic sheets.

Nowadays, the most common plastic explosives contain an explosive charge (hexogen (RDX) and/or pentrite, for example), a rubber

CLAIMS

1. A malleable solid explosive, characterized in that it is in the form of a block consisting, for at least 98% of its weight, of a pulverulent explosive charge and of a liquid chosen from polyol polymers of the group of polyisobutylene polyols, polybutadiene polyols, polyether polyols, polyester polyols and polysiloxane polyols, whose number-average molecular mass is between 500 and 10 000, and mixtures thereof.

2. The malleable solid explosive as claimed in claim 1, characterized in that said pulverulent explosive charge represents at least 85% by weight relative to the total weight of said block.

3. The malleable solid explosive as claimed in claim 1 or 2, characterized in that said explosive charge is chosen from octogen, hexogen, pentrite, CL20, TATB, ONTA, HNS, DADNE and mixtures thereof, and advantageously from octogen, hexogen, pentrite and CL20.

4. The malleable solid explosive as claimed in any one of claims 1 to 3, characterized in that said liquid is chosen from said polybutadiene polyols and mixtures thereof~~; in that said liquid advantageously consists of a hydroxytelechelic polybutadiene~~.

5. The malleable solid explosive as claimed in claim 4, characterized in that said liquid consists of a hydroxytelechelic polybutadiene.

~~5.~~6. The malleable solid explosive as claimed in any one of claims 1 to 4~~5~~, characterized in that said block contains up to 2% by weight of at least one additive.

~~6.~~7. The malleable solid explosive as claimed in claim ~~5~~6, characterized in that said at least one additive is chosen from: antioxidants, anti-age-curing agents and chemical detection markers.

~~7.~~8. The malleable solid explosive as claimed in any one of claims 1 to ~~6~~7, characterized in that said block contains:

- from 0 to 2% by weight of at least one additive, and
- for at least 98% of its weight :
  + from 85% to 95% and advantageously from 87% to 90% by weight of said explosive charge,
  + from 3% to 13% and advantageously from 8% to 12% by weight of said liquid.

~~8.~~9. The malleable solid explosive as claimed in any one of claims 1 to ~~7~~8, characterized in that said block ~~or cake~~ has a mass of between 100 g and 5 kg.

~~9.~~10. A process for obtaining a malleable solid explosive as claimed in any one of claims 1 to ~~8~~9, characterized in that it comprises:

- the production of a paste by blending a mixture consisting, for at least 98% of its weight, of a pulverulent explosive charge and of a liquid chosen from polyol polymers of the group of polyisobutylene polyols, polybutadiene polyols, polyether polyols, polyester polyols and polysiloxane polyols, the number-average molecular mass of which is between 500 and 10 000, and mixtures thereof,
- the molding of said paste in one (or more) molds and the removal from said molded paste from the mold(s) to obtain one (or more) blocks of said malleable solid explosive or the cutting of said paste extruded to obtain blocks of said malleable solid explosive.

~~10.~~11. The process as claimed in claim ~~9~~10, characterized in that said blending is performed at room temperature or at elevated temperature, at a temperature of less than or equal to 80°C.

~~11.~~12. The process as claimed in claim ~~9~~10 or ~~10~~11, characterized in that it is performed in continuous or batch mode.