Title (en)

Pyrotechnic millisecond delay charge for industrial detonators with delay time of explosion of 25 to 1,000 ms from initiation and the way of manufacture of the delay charge

Title (de)

Pyrotechnische Millisekundenverzögerungsladung für Industriezündkapseln mit einer Explosionsverzögerungszeit von 25 bis 1.000 ms ab Initiierung und Verfahren zur Herstellung der Verzögerungsladung

Title (fr)

Charge à retard de milliseconde pyrotechnique pour détonateurs industriels avec temps de retard d'explosion de 25 à 1 000 ms d'initiation et procédé de fabrication de la charge à retard

Publication

EP 2589582 A2 20130508 (EN)

Application

EP 12466011 A 20120626

Previously filed application

20110463 20110728 CZ

Priority

CZ 2011463 A 20110728

Abstract (en)

Pyrotechnic delay charge that contains FeSiZr as combustible and Bi 2 O 3 as oxidizer in proportion 50 ± 15 wt. % FeSiZr and 50 ± 15 wt. % Bi 2 O 3 . FeSiZr is an alloy of dominant elements Si, Zr, Fe and Ti with content of trace impurities originating from aluminosillicates. The limit representation of dominant elements in FeSiZr is as follows: Si at least 30 wt. %, Zr at least 10 wt. %, Fe at the most 25 wt. %, Ti at least 1 wt. %. The controller of combustion speed is the additive TiO 2 in the amount of up to 5 wt. % of the total weight. The way of manufacture of the pyrotechnic millisecond delay charge in which FeSiZr with limit representation of dominant elements Si at least 30 wt. %, Zr at least 10 wt. %, Fe at the most 25 wt. % and Ti at least 1 wt. %, are prepared in the physical process of grinding to the particle size in the range of 1-10 µm, Bi 2 O 3 to the particle size in the range of 1- 10 µm, whereupon these two components in proportion 50 ± 10 wt. % FeSiZr and 50 ± 10 wt. % Bi 2 O 3 are mechanically homogenized nad pelletized with pressure of 255 MPa, and after that are crushed to grading of 0.2 - 0.8 mm grain size. Finally, the charge is pressed into the delay tube with pressure of 280 MPa with column height of 5 up to 40 mm. Industrial non-electric detonator has an enclosure in shape of a shell (1) with inserted detonation tube. In the enclosure there is created a space at least for the primary explosive and for the delay charge. The shell (1) closed at the bottom side has in its bottom part created a space (11) for the secondary explosive, which is from above closed with delay tube (12), in the cylindrical box of which there is placed primary explosive (13) and delay charge (14) above it. Over the delay charge (12) in shell (1) is inserted a sleeve (15) with amplifying charge (16) closed with cover (17), and inserted from the upper part into shell (1) there is the detonation tube (19), fitted with insulation (18) against the enclosure of the shell (1). Industrial electric detonator has in shell (2) the fusehead (25) inserted, with in-lead wires (26) fitted with insulation (27) against enclosure of the shell (2).

IPC 8 full level

C06C 5/06 (2006.01); **C06C 7/00** (2006.01)

CPC (source: EP)

C06C 5/06 (2013.01); **C06C 7/00** (2013.01)

Citation (applicant)

- SE 446180 B 19860818 - BOFORS AB [SE]
- SE 457380 B 19881219 - CXA LTD [CA]
- US 5654520 A 19970805 - BOBERG TORE [SE], et al

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 2589582 A2 20130508; **EP 2589582 A3 20160106**; **EP 2589582 B1 20190731**; CZ 2011463 A3 20130220; CZ 306594 B6 20170322; ES 2761302 T3 20200519; HR P20192092 T1 20200529

DOCDB simple family (application)

EP 12466011 A 20120626; CZ 2011463 A 20110728; ES 12466011 T 20120626; HR P20192092 T 20191121