

MINING

EXPANSION SHELL BOLTS

TYPE KE-3W AND KE3-2K

*Certificate of Conformity issued by "INOVA" Technical Innovation Centre Ltd.
No. 63/4/2017*

DESCRIPTION

KE-3W and KE3-2K expansion shells of $\varnothing 36$ mm are the elements which set the bolt in the hole. The KE-3W shell consists of 3 shells and one expander while the KE3-2K shell consists of 3 shells and 2 expanders.

Bolt rods are made of plain AP 600 steel bar of $\varnothing 18,3$ mm according to ZN-97/AP-2 standard. The rods vary in terms of shape and size of forged head.

APPLICATION AND USE

Expansion shell bolts KE-3W and KE3-2K are designed to be used for roof and ribs support in mine working areas as an independent or secondary bolting support system and also to attach various components of mining equipment.



KE-3W (left), KE3-2K (right) and various plate options

ADVANTAGES

- Fast bolting system
- Dimensional diversity of the length of the expansion shell
- Various solutions of bolt forged heads
- Various plate versions available

TECHNICAL DATA

DESIGN DATA

The following rods can be used within KE-3W and KE3-2K expansion bolts:

Bolt type	Rod type						
KE-3W	RS-1SZ	RS-1SZ-Z	RS-1N	RS-1N-Z	KS-1	KS-1N	ES-1
KE3-2K	RS-2SZ	RS-2SZ-Z	RS-2N	RS-2N-Z	KS-2	KS-2N	ES-2

BOLT DATA

Parameter	Value
Rod diameter	ø18.3 mm
Thread	M20
Thread length	80 mm (rod for KE-3W shell) 170 mm (rod for KE3-2K shell)
Rod length	1200 ; 1400 ; 1600 ; 1800 ; 2000 ; 2200 ; 2400 ; 2600 ; 2800 ; 3000 ; 3200 mm
Head diameter KE-3W ; KE3-2K	ø36 mm
Head length	KE-3W - 93 mm
	KE3-2K - 136 mm
Bolt capacity according to regulations	min 100 kN
Useful load	170 kN

All washers are made of 6 mm metal plate. The washers differ in terms of press forming method and thickness.

The washers may have a conical or flat hole. The following washer plates can be used with the bolts:

- Square
- Square with a side hole
- Round
- Triangular
- Octagonal

APPLICATION METHOD

- Drill a hole of $\varnothing 38 \pm 0.5$ mm in diameter and length equal to the length of the bolt.
- Reassemble the bolt by placing the washer and shell on the rod.
- Place the bolt in the hole and push until the washer rests against the rock surface.
- Turn the rod and as a result the shell expands in the hole.
- Tighten the bolt by applying at least 250 Nm torque in order to obtain pretension of at least 30 kN.

Washers with a side hole of $\varnothing 15$ can be used for attaching elements of mining equipment. They should be used if there is no hole in the rod.

PACKAGING AND TRANSPORTATION

As a standard practice, anchor poles are packed in bundles of 10 pcs or in bundles of 100-300 pcs and plates are stapled with 10 pcs of wire.

Other packaging options available on request.

Expansion shells and plates are placed in containers and elements of the bolts can be transported by any means of transport in bundles or in containers.

APPROVALS AND CERTIFICATES

- KE-3W; KE3-2K expansion bolts have a Certificate of Conformity No. 63/4/2017 issued by "INOVA" Technical Innovation Centre Ltd. in Lubin.

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