

**MINING**

**SQUARE ARCHES**

**V-25 SECTION SHAPE**

*Certificate issued by the Central Mining Institute in Katowice  
No B/1025/V/2016*

**DESCRIPTION**

The idea for designing these arches was created thanks to cooperation with the mining industry and is a response to the requirements of a rectangular coal mine to obtain a large width of the excavation.

Square arches consist of elements made of V-25 section shape joined by “overlapping” SD25 or SDO25 clamps.

**APPLICATION AND USE**

Square arches of V-25 section shape are designed to support mining excavations of square shape.

Arches are used for face installation and for bolting roadways in case of crossing worse geological conditions.

**ADVANTAGES**

- Arches successfully used for yeas in coal mines
- Suitable for excavations drilled with the continuous mining method
- Enables two-stage excavation

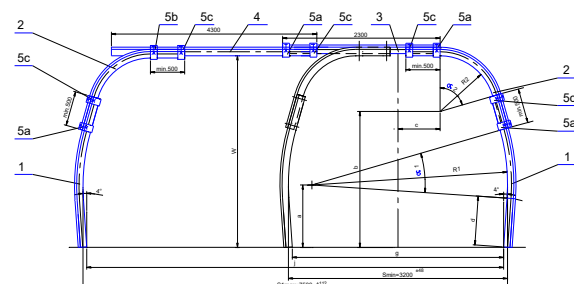


**TECHNICAL DATA**

**CONFIGURATION NO 1**

The configuration shown to the below drawing is to support square mining excavations of the following cross - sections:

- height: from 2200 mm to 4000 mm
- width: from 3200 mm to 7500 mm



**BASIC DIMENSIONS**

S;S1 (mm)	W (mm)	R1 (mm)	R2 (mm)	Angle1 (°)	Angle2 (°)
3200 ± 48 / 7500 ± 112	2200 ±33	1800 ±18	700 ±14	20 ±1	74±1
	2500 ±37	2400 ±24	700 ±14	25 ±1	69±1
	2800 ±42	2800 ±28	800 ±16	19 ±1	75±1
	3100 ±46	3200 ±32	800 ±17	19 ±1	75±1
	3400 ±51	4000 ±40	800 ±18	20 ±1	74±1
	3700 ±55	4500 ±45	800 ±19	20 ±2	74±2
	4000 ±60	5000 ±50	800 ±20	20 ±3	74±3

S;S1 (mm)	W (mm)	a (mm)	b (mm)	c (mm)	d (mm)	g (mm)	j (mm)
3200 ± 48 / 7500 ± 112	2200 ±33	700	1500	730	575	3102 ±47	7402 ±112
	2500 ±37	720	1800	620	540	3101 ±47	7401 ±112
	2800 ±42	1000	2000	640	790	3062 ±46	7362 ±111
	3100 ±46	1200	2300	610	970	3034 ±46	7334 ±111
	3400 ±51	1200	2600	566	924	3046 ±46	7346 ±111
	3700 ±55	1400	2900	546	1088	3026 ±46	7326 ±111
	4000 ±60	1562	3200	527	1216	3006 ±46	7306 ±111

**WEIGHT OF ELEMENTS FOR S=3200 ± 48**

W (mm)	Pos.1 Total (kg)	Pos.2 Total (kg)	Pos.3 (kg)	Pos.5 (kg)	Total arch weight
2200 ± 33	86.2	99.0	57.5	52.0	294.7
2500 ± 37	105.6	95.6			310.7
2800 ± 42	111.8	106.2			327.5
3100 ± 46	127.6	106.2			343.3
3400 ± 51	142.0	105.4			356.9
3700 ± 55	159.0	105.4			373.9
4000 ± 60	174.1	105.4			389.0

**WEIGHT OF ELEMENTS FOR S1=7500 ± 112**

W (mm)	Pos.1 Total (kg)	Pos.2 Total (kg)	Pos.3 (kg)	Pos.4 (kg)	Pos.5 Total (kg)	Total arch weight
2200 ± 33	86.2	99.0	57.5	107.5	65.1	415.3
2500 ± 37	105.6	95.6				431.3
2800 ± 42	111.8	106.2				448.1
3100 ± 46	127.6	106.2				463.9
3400 ± 51	142.0	105.4				477.5
3700 ± 55	159.0	105.4				494.5
4000 ± 60	174.1	105.4				509.6

Quantity of elements for one arch is 5 or 6 depending on height.

The roof beam is made of one or two straight elements. The rib part is made of two elements of different curvature but straight along the overlapping length in order to make joining possible despite different radius. Overlapping for all arches is the same and is 500 mm.

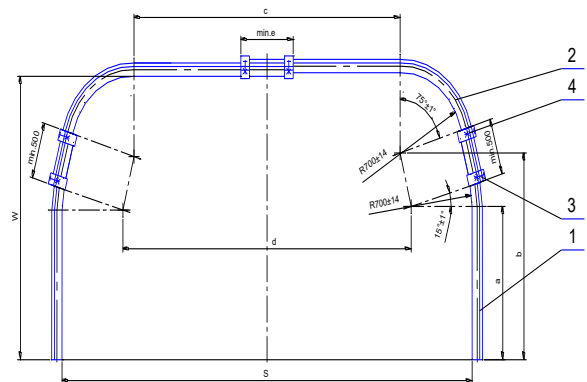
Different arch height is achieved by changing the length and radius of rib element.

Different arch width is achieved by using one or two straight elements of roof beam.

**CONFIGURATION NO 2**

The configuration shown to the below drawing is to support square mining excavations of the following cross - section:

- height: from 2200 mm to 4000 mm
- width: from 3200 mm to 7500 mm



**BASIC DIMENSIONS AND WEIGHT FOR S= 3200 ÷ 4700**

Arch Width S (mm)	Arch Height W (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	Unit Height pos.1	Unit Weight pos.2	Total Arch Weight
<b>3200 ± 48</b>	2200 ±33	1017	1500	1540	1800	600	64	42.9	253.1
	2500 ±37	1317	1800					50.4	268.1
	2800 ±42	1617	2100					57.9	283.1
	3100 ±46	1917	2400					65.4	298.1
	3400 ±51	2217	2700					72.9	313.1
	3700 ±55	2517	3000					80.4	328.1
	4000 ±60	2817	3300					87.9	343.1
	<b>3700 ± 55</b>	2200 ±33	1017					1500	2040
2500 ±37		1317	1800	50.4	280.7				
2800 ±42		1617	2100	57.9	295.7				
3100 ±46		1917	2400	65.4	310.7				
3400 ±51		2219	2700	72.9	325.7				
3700 ±55		2517	3000	80.4	340.7				
4000 ±60		2817	3300	87.9	355.7				
<b>4200 ± 63</b>		2200 ±33	1017	1500	2540	2800	600	76.5	
	2500 ±37	1317	1800	50.4					293.1
	2800 ±42	1617	2100	57.9					308.1
	3100 ±46	1917	2400	65.4					323.1
	3400 ±51	2219	2700	72.9					338.1
	3700 ±55	2517	3000	80.4					353.1
	4000 ±60	2817	3300	87.9					368.1
	<b>4700 ± 70</b>	2200 ±33	1017	1500					3040
2500 ±37		1317	1800	50.4	308.1				
2800 ±42		1617	2100	57.9	323.1				
3100 ±46		1917	2400	65.4	338.1				
3400 ±51		2219	2700	72.9	353.1				
3700 ±55		2517	3000	80.4	368.1				
4000 ±60		2817	3300	87.9	383.1				

**BASIC DIMENSIONS AND WEIGHT FOR S= 5500 ÷ 7500**

Arch Width S (mm)	Arch Height W (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	Unit Height pos.1	Unit Weight pos.2	Total Arch Weight
<b>5500 ± 82</b>	2200 ±33	1017	1500	3840	4100	700	94	42.9	313.1
	2500 ±37	1317	1800					50.4	328.1
	2800 ±42	1617	2100					57.9	343.1
	3100 ±46	1917	2400					65.4	358.1
	3400 ±51	2219	2700					72.9	373.1
	3700 ±55	2517	3000					80.4	388.1
	4000 ±60	2817	3300					87.9	403.1
	<b>6200 ± 93</b>	2200 ±33	1017					1500	4540
2500 ±37		1317	1800	50.4	353.1				
2800 ±42		1617	2100	57.9	368.1				
3100 ±46		1917	2400	65.4	383.1				
3400 ±51		2219	2700	72.9	398.1				
3700 ±55		2517	3000	80.4	413.1				
4000 ±60		2817	3300	87.9	428.1				
<b>7500 ± 112</b>		2200 ±33	1017	1500	5840	6100	1500	129	
	2500 ±37	1317	1800	50.4					398.1
	2800 ±42	1617	2100	57.9					413.1
	3100 ±46	1917	2400	65.4					428.1
	3400 ±51	2219	2700	72.9					443.1
	3700 ±55	2517	3000	80.4					458.1
	4000 ±60	2817	3300	87.9					473.1

The roof beam is made of two elements which are straight along the roof and overlapping part.

The overlapping length between roof and rib elements is 500 mm, whilst the overlapping length between roof elements is from 600 to 1500 mm.

Different arch height is achieved by changing the length and radius of rib element.

Different arch width is achieved by using one or two straight elements of roof beam.

## APPLICATION METHOD

To increase capacity, it is recommended secondary bolting by one or two pair of bolts.

## PACKAGING AND TRANSPORTATION

Housing components packed and sent in packages of 10-20 items.

## APPROVALS AND CERTIFICATES

- Square arches of type V25 section shape have certificate No B/1025/V/2016 issued by the Central Mining Institute 'Główny Instytut Górnictwa' in Katowice.

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