

*We Are, Where Heat Is On...*

# **PRODUCTS DATA SHEETS**



## **JAY CERAMICS**

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## INDUSTRIES WE SERVE

**We supply our products and provide our services to a variety of companies. Some of the Industries we serve include :**

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- \* Cement Industries
- \* Ceramic Industries
- \* Chemicals Plants
- \* Dairy Plants
- \* Electroplating Industries
- \* Fertilizers Plants
- \* Forging Plants
- \* Foundry Industries
- \* Galvanizing
- \* Glass Industries
- \* Heat Treatment Plants
- \* Insulation
- \* Iron & Steel Industries
- \* Oil Refineries
- \* Paints Industries
- \* Paper Industries
- \* Petrochemicals Plants
- \* Petroleum Industries
- \* Plastics Industries
- \* Porcelain Industries
- \* Refractories Industries
- \* Rolling Mills
- \* Rubber Plants
- \* Soap
- \* Sugar Plants
- \* Textiles Plants
- \* Tiles Industries



## Manufacturers of Refractories & Kiln Furniture

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## TECHNICAL DATA JAY AL - 40%

JAY AL - 40% is 40% Alumina Brick based on calcined bauxite of Rotary Kiln with good thermal spalling resistance, medium porosity and good mechanical strength. Applications includes Cement Rotary Kilns, Reheat Furnaces, Metallurgical Furnaces, Boiler Furnaces, Linings for general purpose use in steel plants including Tundish Lining and Ceramic Kilns.

## CHEMICAL ANALYSIS

Alumina $\text{Al}_2\text{O}_3$	38.00 - 40.00%
Silica $\text{SiO}_2$	38.00 - 42.00%
Ferric Oxide $\text{Fe}_2\text{O}_3$	Max . 3.10%
Titania $\text{TiO}_2$	2.90 - 3.50%
Calcia $\text{CaO}$	1.00 - 1.50%

## PHYSICAL PROPERTIES

Pyrometric Cone Equivalent, Ortron	.....	Min. 32 (1743° C)
Reheat change - at 1400° C - 2Hrs, %	.....	Max. (+/-) 0.5%
Refractoriness under Load - ta Value	.....	Min 1400° C
Apparent Porosity %	.....	17.0 - 20.0%
Bulk Density, gm /cm <sup>3</sup>	.....	2.30 - 2.50
Cold Crushing, Strength, Kg/cm <sup>2</sup>	.....	400 - 600
Thermal Conductivity, W/Mok at 650° C	.....	1.70
at 1000° C	.....	1.60

### IMPORTANT NOTE

THE ABOVE TEST DATA are based on average results of Control tests on dry pressed standard size bricks and are subject to normal variation on individual tests, hence these results should not be regarded as absolute limits.



## TECHNICAL DATA JAY AL - 50%

JAY AL - 50% is 50% Alumina Brick based on calcined bauxite of Rotary Kiln with good thermal spalling resistance, low porosity and excellent mechanical strength, Applications includes Cement Rotary Kilns, Reheat Furnaces, Metallurgical Furnaces, Boiler Furnaces, Rosting Kilns, Linings for general purpose use in steel plants including Tundish Lining and Ceramic Kilns.

## CHEMICAL ANALYSIS

Alumina $Al_2O_3$	48.00 - 53.00%
Silica $SiO_2$	38.00 - 42.00%
Ferric Oxide $Fe_2O_3$	Max . 3.10%
Titania $TiO_2$	2.90 - 3.50%
Calcia $CaO$	1.00 - 1.50%

## PHYSICAL PROPERTIES

Pyrometric Cone Equivalent, Ortron	.....	Min. 33 (1743° C)
Reheat change - at 1400° C - 2Hrs, %	.....	Max. (+/-) 0.5%
Refractoriness under Load - ta Value	.....	Min 1400° C
Apparent Porosity. %	.....	17.0 - 20.0%
Bulk Density, gm/cm <sup>3</sup>	.....	2.30 - 2.50
Cold Crushing, Strength, Kg/cm <sup>2</sup>	.....	400 - 600
Thermal Conductivity, W/Mok at 650° C	.....	1.70
at 1000° C	.....	1.60

### IMPORTANT NOTE

THE ABOVE TEST DATA are based on average results of Control tests on dry pressed standard size bricks and are subject to normal variation on individual tests, hence these results should not be regarded as absolute limits.



## TECHNICAL DATA JAY AL - 60%

JAY AL - 60% is high Alumina Brick having 60% Alumina Contents based on Refractory grade bauxite calcined in Rotary kiln, High density and excellent strength, featuring low alkali contents, applications includes Cement and Lime Rotary and Saft Kilns, Re-heat Furnace, Incinerators, Ceramic Kilns, Boiler Furnaces, Reverbertory air or holding Furnaces.

## CHEMICAL ANALYSIS

Alumina $Al_2O_3$	58.00 - 62.00%
Silica $SiO_2$	31.00 - 35.00%
Ferric Oxide $Fe_2O_3$	2.50 - 3.10%
Titania $TiO_2$	2.75 - 3.00%
Calcia $CaO$	0.50 - 1.70%

## PHYSICAL PROPERTIES

Pyrometric Cone Equivalent, Ortron	.....	Min. 35 (1785° C)
Reheat change - at 1400° C - 2Hrs, %	.....	Max. (+/-) 0.5%
Refractories under Load - ta Value	.....	1420° - 1450° C
Apparent Porosity. %	.....	19.0 - 22.0%
Bulk Density, gm/cm <sup>3</sup>	.....	2.45 - 2.60
Cold Crushing, Strength, Kg/cm <sup>2</sup>	.....	400 - 600
Thermal Conductivity, W/Mok at 700° C	.....	1.40
at 900° C	.....	1.20

### IMPORTANT NOTE

THE ABOVE TEST DATA are based on average results of Control tests on dry pressed standard size bricks and are subject to normal variation on individual tests, hence these results should not be regarded as absolute limits.



## TECHNICAL DATA JAY AL - 70%

JAY AL - 70% is dense, low porosity, 70% Alumina Brick based on Refractory grade bauxite calcined in Rotary kiln with excellent resistance to spalling, corrosive slags and hot metals, Successful applications in Burning zone linings of Tunnel Kiln and Hot Air Generators, Electric Arc Furnace Roof Steel Teeming Laddles, Induction Furnace, Sugar Mills, Chemical Plants and many others.

## CHEMICAL ANALYSIS

Alumina $Al_2O_3$	68.00 - 73.00%
Silica $SiO_2$	19.00 - 25.00%
Ferric Oxide $Fe_2O_3$	2.80 - 3.20%
Titania $TiO_2$	3.40 - 3.90%
Calcia $CaO$	1.50 - 2.00%

## PHYSICAL PROPERTIES

Pyrometric Cone Equivalent, Ortron	.....	Min. 36 (1804° C)
Reheat change - at 1400° C - 2Hrs, %	.....	Max. (+/-) 2.5%
Refractories under Load - ta Value	.....	1430° - 1480° C
Spalling Test, Water quench - 1300° C	.....	Min 10 Cycles
Apparent Porosity. %	.....	18.0 - 22.0%
Bulk Density, gm/cm <sup>3</sup>	.....	2.65 - 2.75
Cold Crushing, Strength, Kg/cm <sup>2</sup>	.....	Min 500
Thermal Conductivity, W/Mok at 650° C	.....	1.60
at 1000° C	.....	1.65

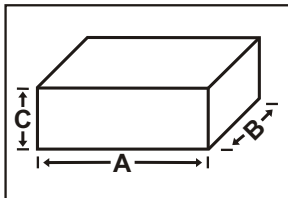
### IMPORTANT NOTE

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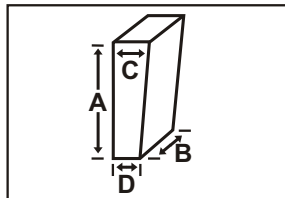


## STANDARD SHAPE AND SIZE OF BRICKS.

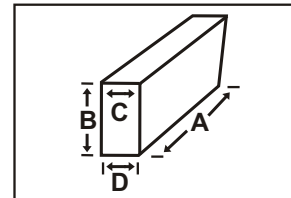
Dimension in Inches			Dimension in Millimetres		
A	B	C	A	B	C
9"	x 4 <sup>1</sup> / <sub>2</sub> "	x 3"	230	x 115	x 75
9"	x 4 <sup>1</sup> / <sub>2</sub> "	x 2 <sup>1</sup> / <sub>2</sub> "	230	x 115	x 65
9"	x 4 <sup>1</sup> / <sub>2</sub> "	x 2"	230	x 115	x 50
9"	x 4 <sup>1</sup> / <sub>2</sub> "	x 1 <sup>1</sup> / <sub>2</sub> "	230	x 115	x 40
9"	x 4 <sup>1</sup> / <sub>2</sub> "	x 1"	230	x 115	x 25



**ARCH BRICKS**

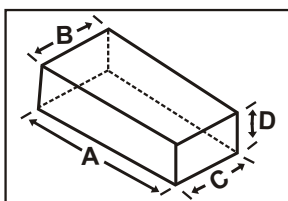


**END ARCH**

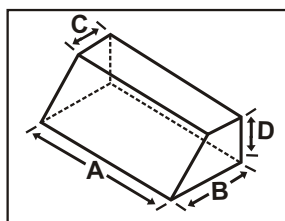


**SIDE ARCH**

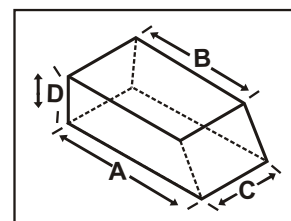
A	B	C	D	A	B	C	D
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 2.75"	230 x 115	x 75 x 70				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 2 <sup>1</sup> / <sub>2</sub> "	230 x 115	x 75 x 65				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 2 <sup>1</sup> / <sub>4</sub> "	230 x 115	x 75 x 55				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 2"	230 x 115	x 75 x 50				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 1.75"	230 x 115	x 75 x 45				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 1 <sup>1</sup> / <sub>2</sub> "	230 x 115	x 75 x 40				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 1 <sup>1</sup> / <sub>4</sub> "	230 x 115	x 75 x 30				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 1"	230 x 115	x 75 x 25				
9" x 4 <sup>1</sup> / <sub>2</sub> "	x 3" x 1/4"	230 x 115	x 75 x 06				



**KEY**



**SIDE SKEW**

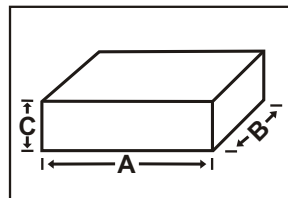


**END SKEW**



## STANDARD SHAPE AND SIZE OF FIRE TILES

Dimension in Inches			Dimension in Milimetres		
A	B	C	A	B	C
9"	x 9"	3"	230	x 230	75
12"	x 12"	3"	310	x 310	75
15"	x 12"	3"	385	x 310	75
18"	x 12"	3"	460	x 310	75
24"	x 12"	3"	620	x 310	75
15"	x 15"	3"	385	x 385	75
18"	x 18"	3"	460	x 460	75
24"	x 18"	3"	620	x 460	75
12"	x 12"	6"	310	x 310	150
18"	x 12"	6"	460	x 310	150
24"	x 12"	6"	620	x 310	150
12"	x 12"	4.5"	310	x 310	115



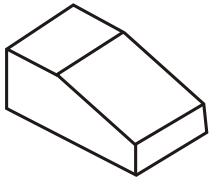
**FIRE TILES**

## STANDARD SHAPE AND SIZE OF BURNER BLOCKS

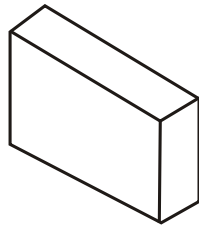
Size	Hole Size	Design
9" x 9" x 9"	6" x 4"	Standard
9" x 9" x 9"	5 <sup>1</sup> / <sub>2</sub> " x 5 <sup>1</sup> / <sub>2</sub> "	Wesman
12" x 12" x 12"	8" x 4"	Standard
14" x 14" x 14"	10" x 4"	Wesman
15" x 15" x 15"	10" x 6"	Standard



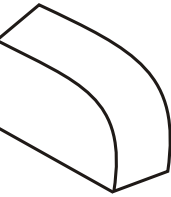
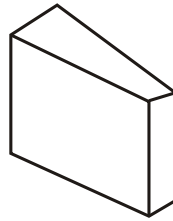
# JAY CERAMICS



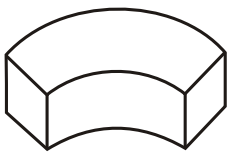
BEVEL BRICK



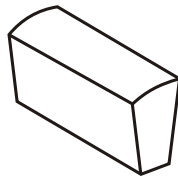
BONDER



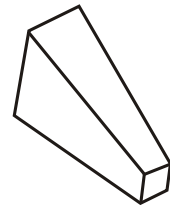
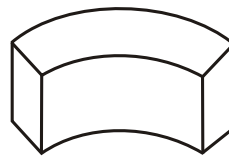
BULLENOSE OR  
JAMB BRICK



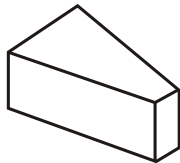
CIRCLE BRICK



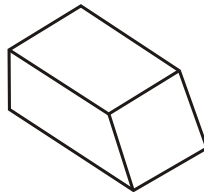
CIRCLE BRICK ONE EDGE



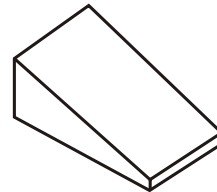
DOMe BRICK



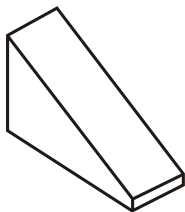
END ARCH



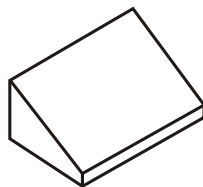
END SKEW ON FLAT



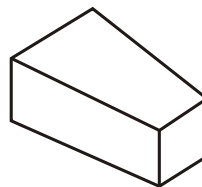
FEADHER END



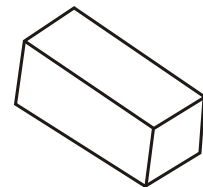
FEADHER END ON EDGE



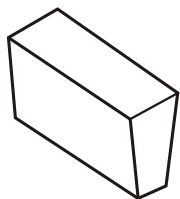
FEADHER SIDE



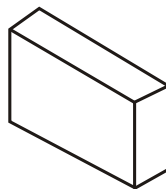
KEY BRICK



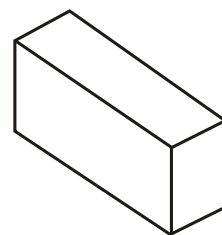
PUP, SOAP OR CLOSER



SIDE ARCH



SPLIT OR SCONE



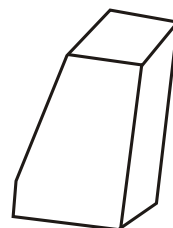
WHELP

LARGE FACE / FLAT

EDGE / SIDE

END FACE

STANDARD SQUARE



SPRINGER / SKEW BACK



## MORTARS

Type	Al <sub>2</sub> O <sub>3</sub> % (Min.)	Fe <sub>2</sub> O <sub>3</sub> % (Max.)	PCE (o.c.) (Min.)	Grain Size (mm.)
Jay - 30	30	2.0	30	0 - .0.5
Jay - 40	40	2.0	32	0 - .0.5
Jay - 50	50	2.5	34	0 - .0.5
Jay - 60	60	3.0	35	0 - .0.5
Jay - 70	70	3.5	37	0 - .0.5
Jay - 80	80	3.5	38	0 - .0.5

## INSULATING BRICK

Analysis	Cold Face	Hot Face
Bulk Density (Max.) (gm/cc)	0.7 ± 0.05	1.0 ± 0.05
Apparent Porosity (Min.) % (Volume)	70	58
Cold Crushing Strength (Min. Kg/cm <sup>2</sup> )	10	30
Al <sub>2</sub> O <sub>3</sub> (Min.) %	35	45
Fe <sub>2</sub> O <sub>3</sub> (Min.) %	2.0	1.5
Service Temperature °C	1250	1400
Permenent Linear Changer ( ≤ 2% at °C for 2 hrs.)	1200	1350
Thermal Conductivity (Max.) (Kcal/mh°C at 350°C ± 10°C)	0.20	0.30



## FURNACE TEMPERATURES

KIND OF FURNACES	DEGREES C	DEGREES F
Boilers.....	1000 to 1600	1800 to 2900
By - Product Coke Ovens.....	1000 to 1500	1830 to 2730
Cement Kilns, Hot Zone.....	1300 to 1600	2400 to 2900
Copper Converters.....	1200 to 1300	2200 to 2400
Copper Refining Furnaces.....	1250 to 1550	2300 to 2800
Copper Reverberatories.....	1300 to 1570	2400 to 2850
Copper Roasters.....	700 to 810	1300 to 1500
Gas Producer.....	1260 to 1370	2300 to 2500
Gas Annealing Furnaces.....	430 to 540	800 to 1000
Glass Tanks-bottle.....	1370 to 1600	2500 to 2900
Glass Tanks-plate.....	1370 to 1650	2500 to 3000
<b>Iron and Steel Furnaces :</b>		
➔ Annealing Oven.....	760 to 980	1400 to 1800
➔ Blast Furnaces, tapping.....	1370 to 1540	2500 to 2800
➔ Bessemer Converter.....	1540 to 1650	2800 to 3000
➔ Electric Furnaces.....	1450 to 1700	2650 to 3100
➔ Heating Furnaces.....	980 to 1310	1800 to 2400
➔ Malleable Furnaces.....	1300 to 1650	2400 to 3000
<b>Open Hearths</b>		
➔ Melting Chamber.....	650 to 1680	1200 to 3050
➔ Checkers.....	200 to 1430	400 to 2600
➔ Soaking Pits.....	1150 to 1370	2100 to 2500

## COLOUR SCALE FOR TEMPERATURES

Lowest Visible Red.....	475	885
Lowest Visible Red to Dark Red.....	475 to 650	885 to 1200
Dark Red to Cherry Red.....	650 to 750	1200 to 1380
Cherry Red to Bright Cherry Red.....	750 to 815	1380 to 1500
Bright Cherry Red to Orange.....	815 to 900	1500 to 1650
Orange to Yellow .....	900 to 1090	1650 to 2000
Yellow to Light Yellow.....	1090 to 1315	2000 to 2400
Light Yellow to White.....	1315 to 1540	2400 to 2800
White to Dazzling White.....	1540 to .....	2800 to .....



## CALCULATION FOR BRICKS REQUIRED PER UNIT VOLUME

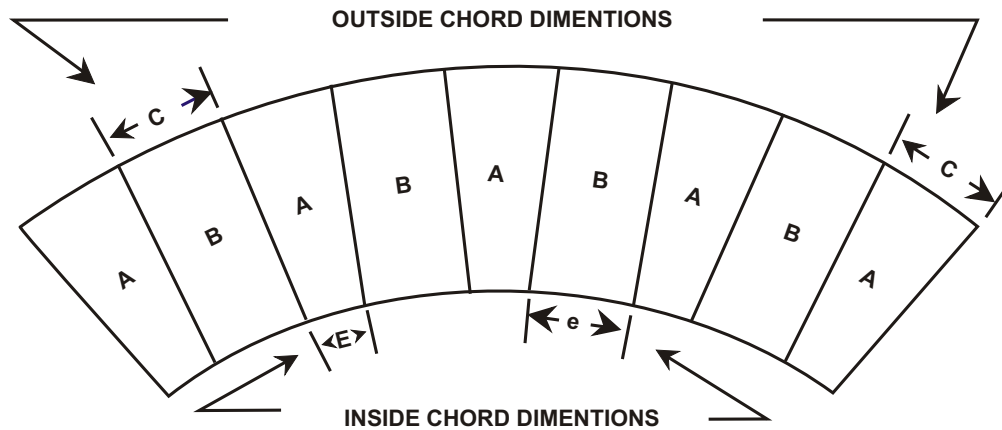
A Cubic Metre Of Brickwork requires	513 Nos. 230 X 115 X 75mm Straights
A Cubic Feet Of Brickwork requires	14.2 Nos. 9" X 4 $\frac{1}{2}$ " X 3" Straights
Volume of 1000 Nos. standard 230 X 115 X 75 mm Straights Closly stacked (approx.)	1.95 Cubic metres
Volume of 1000 Nos. Standard 9" X 4 $\frac{1}{2}$ " X 3" Straights Closly Stacked (approx.)	71 Cubic Feet

## BRICKS REQUIRED PER SQ. FEET OF WALL

Wall Thickness	230 x 113 x 65 mm	230 x 113 x 75 mm
65 mm. (2.5")	3.56	.....
75 mm. (3.0")	.....	3.56
115 mm. (4.5")	6.40	5.30
230 mm. (9.0")	12.80	10.70
340 mm. (13.5")	19.20	16.00
460 mm. (18.0")	25.60	21.30
575 mm. (22.5")	32.00	26.70
690 mm. (27.0")	38.40	32.00



## COMBINATIONS TO FORM A RING WITH TWO SIZES OF BRICK



- A - A radial brick used with a straight or another radial B, which turns a larger circle than A.
- B - A straight brick or a radial brick which turns a larger circle than A, both A and B forming the same thickness of arch T.
- T - The thickness of the arch formed by A and B.
- C - The outside chord of brick A.
- c - The outside chord of brick B.
- E - The inside chord of brick A.
- e - The inside chord of brick B.
- D - Given outside diameter of desired ring.
- d - Given inside diameter of desired ring.
- G - Outside diameter of ring formed by radial brick A alone.
- J - Number of brick A to form a ring of outside diameter G.
- g - Outside diameter of ring formed by brick B alone if it is radial.
- j - Number of brick B to form a ring of outside diameter g.
- x - Number of pieces of brick A, used with brick B to form a ring of outside diameter D.
- y - Number of pieces of brick B, used with brick A to form a ring of outside diameter D.
- S - Total number of pieces of brick A and brick B to form a ring of outside diameter D.



## COMBINATIONS TO FORM A RING WITH TWO SIZES OF BRICK (Contd...)

I. WHEN BOTH BRICK A AND B ARE RADIAL AND OUTSIDE CHORDS ARE EQUAL ( $C = C$ ) BUT INSIDE CHORD ARE UNEQUAL.

$$(1) S = \frac{D}{C} = \frac{D}{C}$$

$$(2) Y = \frac{d - SE}{e \cdot E}$$

II. WHEN BRICK B IS A STRIGHT BRICK AND BRICK A IS REDIAL,  $C = E$  AND

$$(3) x = \frac{2 T}{C \cdot E} = \frac{6.2832T}{C \cdot E}$$

$$(4) y = \frac{D - xC}{c}$$

III. WHEN BRICK A AND B ARE RADIAL AND BOTH CHORD DIMENSIONS OF A DIFFER FROM THOSE OF B.

$$(5) Cx + cy = D$$

$$(6) EX + ey = d$$

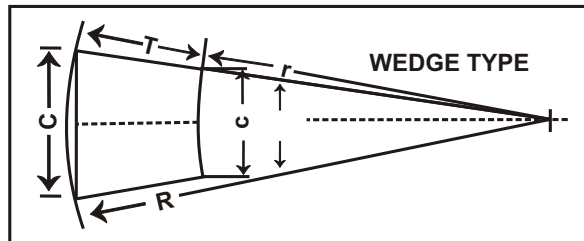
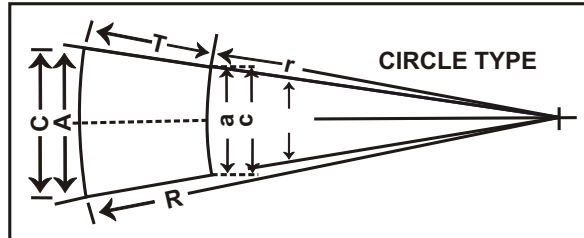
IV. WHEN CALCULATING A SERIES OF COMBINATION THE FOLLOWING FORMULAS ARE CONVENIENT :

$$(1) X = \frac{J(g \cdot D)}{g \cdot G}$$

$$(2) Y = \frac{J(g \cdot D)}{g \cdot G}$$



## RADIAL BRICK FORMULAS



### KEY TO SYMBOLS

- |  |  |
|--|--|
| a - Inside arc of circle type brick                | D - Outside diameter of ring formed by radial brick              |
| A - Outside arc of circle type brick               | T - Radial dimension of brick                                    |
| c - Inside chord of circle or wedge type brick     | $\theta$ - Theta, the included angle of brick                    |
| C - Outside chord of circle or wedge type brick    | $\rho$ - Pi - 3.1416   |
| r - Inside radius of radial brick                  | S - Total number of a given radial brick required to form a ring |
| R - Outside radius of radial brick                 |  |
| d - Inside diameter of ring formed by radial Brick |  |

### FORMULAS :

$$c = \frac{rC}{r+T} = \frac{rC}{R}$$

$$S = \frac{2T}{C-c} = \frac{D}{C} = \frac{d}{c}$$

$$C = \frac{(r+T)c}{r} = \frac{Rc}{r} = \text{Sine } \frac{\theta}{2} = \frac{C}{2R} \text{ or } \frac{c}{2r}$$

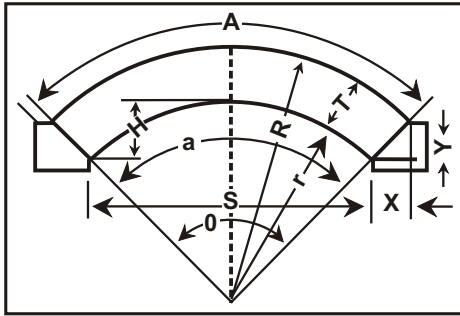
$$= \frac{360^\circ}{S}$$



## TABLE FOR USE IN DESIGNING RADIAL TYPE BRICK

If the outside chord of a radial brick is desired for a given number of pieces per ring, find the number of pieces in column 1 and multiply the corresponding sine of the half angle in column 2 by the outside diameter of the ring. If brick with an outside chord of approximately 9" is desired, find the diameter in column 3 that comes closest to the desired outside diameter. Then multiply the corresponding sine of the half angle in column 2 by the desired outside diameter to obtain the actual chord. The number of pieces to form a ring will be found in column 1.

No. of brick to Circle (1)	Sine of Half Angle (2)	Dia. for 9" Chord in inches (3)	No. of brick to Circle (1)	Sine of Half Angle (2)	Dia. for 9" Chord in inches (3)
5	0.58779	15.312	53	0.05924	151.924
6	0.50000	18.000	54	0.05815	154.772
7	0.43388	20743	55	0.05709	157.646
8	0.38268	23.518	56	0.05607	160.514
9	0.34202	26.314	57	0.05508	163.399
10	0.30902	29.124	58	0.05414	166.236
11	0.28173	31.945	59	0.05322	169.109
12	0.25882	34.773	60	0.05234	171.953
13	0.23932	37.607	61	0.05147	174.859
14	0.22252	40.446	62	0.05065	177.590
15	0.20791	43.288	63	0.04985	180.542
16	0.19509	46.133	64	0.04907	183.411
17	0.18375	48.980	65	0.04832	186.258
18	0.17365	51.681	66	0.04758	189.155
19	0.16459	54.681	67	0.04687	192.020
20	0.15643	57.534	68	0.04618	194.890
21	0.14904	60.386	69	0.04552	197.715
22	0.14231	63.242	70	0.04486	200.624
23	0.13616	66.099	71	0.04423	203.482
24	0.13053	68.950	72	0.04362	206.327
25	0.12533	71.810	73	0.04302	209.205
26	0.12054	74.664	74	0.04244	212.064
27	0.11609	77.526	75	0.04188	214.900
28	0.11197	80.379	76	0.04132	217.612
29	0.10812	83.241	77	0.04079	220.642
30	0.10453	86.100	78	0.04027	223.491
31	0.10117	88.959	79	0.03975	226.415
32	0.09802	91.818	80	0.03926	229.241
33	0.09506	94.670	81	0.03878	232.078
34	0.09227	97.540	82	0.03830	234.987
35	0.08964	100.402	83	0.03784	237.844
36	0.06716	103.258	84	0.03739	240.706
37	0.08481	106.120	85	0.03695	243.572
38	0.08258	108.985	86	0.03652	246.540
39	0.08047	111.843	87	0.03610	249.307
40	0.07846	114.708	88	0.03569	252.171
41	0.07655	117.570	89	0.03529	255.030
42	0.07473	120.434	90	0.03490	257.880
43	0.07299	123.305	91	0.03452	260.718
44	0.07134	126.156	92	0.03414	263.620
45	0.06776	129.014	93	0.03377	266.509
46	0.06825	131.868	94	0.03341	269.380
47	0.06680	134.731	95	0.03306	272.232
48	0.06540	137.615	96	0.03272	275.061
49	0.06407	140.471	97	0.03238	277.949
50	0.06279	143.335	98	0.03205	280.811
51	0.06159	146.199	99	0.03173	283.643
52	0.06038	149.056	100	0.03141	286.533



## ELEMENTS OF ARCHES

### Formulas

To find the rise when radius and span are given :

$$H = r \cdot \sqrt{1 - \frac{S^2}{4r^2}}$$

To find the inside radius when rise and span are given :

$$r = \frac{S^2 + 4H^2}{8H}$$

To find the angle  $\theta$  when the radius and span are given :

$$\sin \frac{\theta}{2} = \frac{S}{2r}$$

To find the lengths when the radius and central angle are given :

Outer arc :

Inner arc :

$$A = \frac{2 R}{360}$$

$$a = \frac{2 r}{360}$$

### KEY TO SYMBOLS

S = Span of arch

H = Rise of arch

R = Outside radius of arch

r = Inside radius of arch

T = Thickness of arch

A = Outer arch length

a = Inner arch length

e = Central Angle

### VALUES FOR GIVEN RISES PER FOOT OF SPAN

Rise in Inches Per Foot of Span	Inside * Arc is Factor xS	Central Angle		Inside * Arc is Factor xS	Diff.of Outer and Ineer Arcs factor xT	Skewback	
		Degrees	Part of Circle			X * is Factor x T	Y * is Factor x T
1	1.5417	37°50.9'	0.1051	0.0184	0.0184	0.3243	0.9460
1 <sup>1</sup> / <sub>4</sub>	1.2521	47°4.4'	0.1308	1.0287	1.0287	0.3993	0.9168
1 <sup>1</sup> / <sub>2</sub>	1.0625	56°8.7'	0.1560	1.0412	1.0412	0.4706	0.8824
1.608	1.0000	60°0.0'	0.1667	1.0472	1.0472	0.5000	0.8660
1 <sup>3</sup> / <sub>4</sub>	0.9301	65°2.5'	0.1807	1.0558	1.0558	0.5376	0.8432
2	0.8333	73°44.4'	0.2048	1.0725	1.0725	0.6000	0.8000
2 <sup>1</sup> / <sub>4</sub>	0.7604	82°13.4'	0.2284	1.0913	1.0913	0.6575	0.7534
2.302	0.7474	83°58.5'	0.2333	1.0954	1.0954	0.6690	0.7433
2 <sup>1</sup> / <sub>2</sub>	0.7072	90°28.8'	0.2513	1.1120	1.1120	0.7101	0.7041
2 <sup>3</sup> / <sub>4</sub>	0.6600	98°29.7'	0.2736	1.1346	1.1346	0.7575	0.6528
3	0.6250	106°15.6'	0.2952	1.1591	1.1591	0.8000	0.6000

\* Inside radius, inside arc, difference of outer and inner arcs, x and y arcs, x and y are obtained by multiplying the factor in respect with S or T, whichever applies.



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