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David Woodhead

A.I.Ceram, A.R.I.C, M.SGT, F.I Ref Eng.

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There are 4 main groups of Refractory Insulation

1) IFB's
2) Insulating Monolithics
3) Ceramic Fibres
4) Microporous

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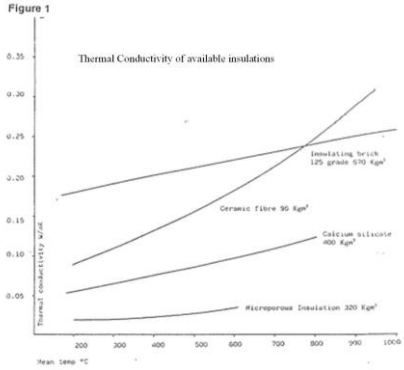
Figure 1



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We have known for a long time that “Still air is a very good insulator”

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With the skin, he made him mittens

Made them with the fur side inside

Made them with the skin side outside

He to get the warm side, inside

Put the inside skin, outside

He to get the cold side, outside

Put the warm side fur, inside

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1) To Reduce Fuel costs
2) To reduce energy usage
3) To reduce the thickness of the structure of the Furnaces
4) More control of temperature or control of the process
5) To reduce the cold face temp, to give a better/safer working area

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Overall heat flow $Q = \frac{K.A.\ 01\text{-}02}{L}$

Where Q = Heat flux

K = Thermal conductivity

A = Cross sectional area

01-02 difference in temp

L= length

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The ideal insulating refractory would have a highly porous structure, with the smallest possible Pores divided and sealed from each other with the thinnest possible walls of low conductivity material

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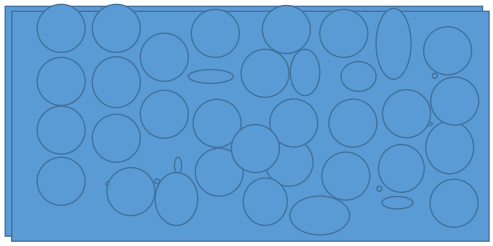

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I have used a word there of classified Temperature which is important, it is not usage temp

But is a measure of temperature at which a brick shrinks by 1% after 12 hours at that temp

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Alumina	38	40	45
silica	49	56	54
Iron	0.8	1.3	1.2
	1	2	3
Bulk density	870	870	790
Ccs	3.5	4.5	3.5
Thermal cond 200c	.22	.28	.26
600	.31	.34	.32
1000	.35	.39	.37
PLC at 1400C %	+1	- 0.6	-0.5
£.each	1.75	2.00	2.25

Which would you choose to use and why?

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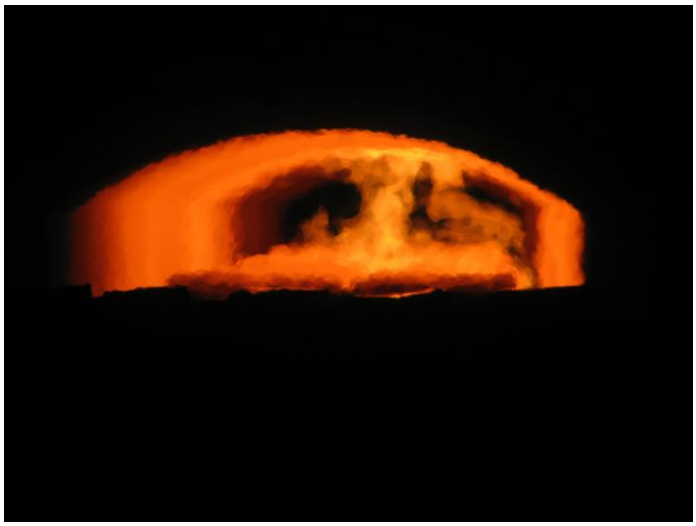

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Figure 3

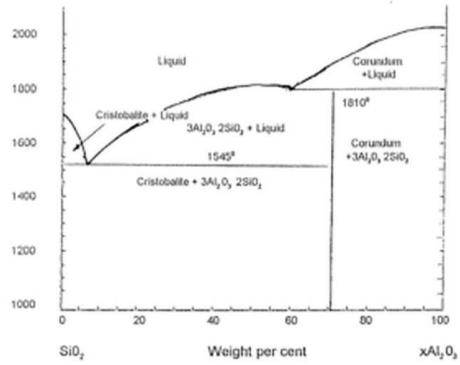

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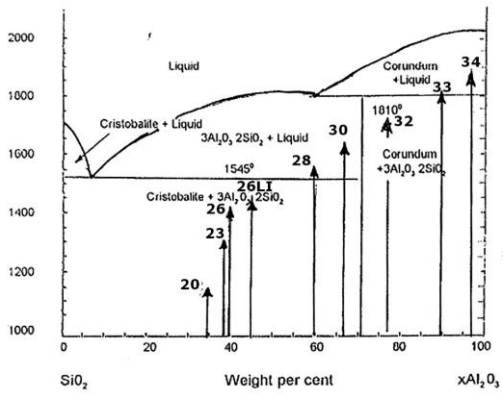
Figure 4



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grade		20	23	26	28	30	32	33	34
Alumina %		35	36	40	60	67	75	91	99
Density		550	550	800	900	1050	1300	1500	1550
Porosity%		85	80	75	72	68	67	64	64
Conductivity									
Mean temp	200	.14	.15	.22	.30	.38	.54	.95	1.2
	600	.22	.21	.31	.37	.42	.58	.90	1.1
	1000	.25	.30	.35	.43	.49	.62	.90	.90
	1200	-	-	-	-	.53	.69	.94	.94