Typical Energy Savings within Kiln Cars using Ultralite™

A comparison of the energy stored and flowing through the kiln car base.

Type of Kiln	industry	Original Construction	Modified Construction	Cavity Dimensions (m) L	W	D	Vol per Car	No of Cars	Total Vol m3	Firing Temp	Original Cold Face Temp °C	Modified Cold Face Temp °C	Original Heat Flow (W/m2)	Modified Heat Flow (W/m2)	% Saving	Original Heat Stored (MJ/m2)	Modified Heat Stored (MJ/m2)	% Saving	% Saving Over Firing Cycle	Weight Saving in Kiln Car Base
Shuttle Kiln	Sanitaryware	Ceramic Fibre with Cordierite Capping Tiles	**Ultralite** with Cordierite Capping Tiles	5.9	1.08	0.2	1.27	6	8	1180	106	103	897	848	**5.5%**	51.25	40.9	**20.2%**	**11%**	**5%**
Tunnel Kiln	Roof Tile	Ceramic Fibre with Dense Cover Slabs and Castable Base	**Ultralite** with Dense Cover Slabs and Castable Base	6.35	4	0.25	6.35	45	286	990	86	79	507	438	**13.6%**	99.32	83.13	**16.3%**	**16%**	**3%**
Tunnel Kiln	Sanitaryware	Ceramic Fibre with Cordierite Capping Tiles	**Ultralite** with Cordierite Capping Tiles	2.29	0.95	0.15	0.33	100	33	1220	141	125	1453	1175	**19.1%**	79.49	68.73	**13.5%**	**16%**	**36%**
Tunnel Kiln	Tableware	Solid Brick (HFK) Construction	**Ultralite** with Cordierite Capping Tiles	1.25	0.3	0.23	0.09	35	4	1300	190	101	2495	827	**66.9%**	213.2	74.95	**64.8%**	**66%**	**56%**
Tunnel Kiln	Brick Manufacturing	Castable Base with Cover Slabs	**Ultralite** with Cover Slabs	3.78	3.848	0.23	3.35	60	201	950	98	73	780	470	**39.7%**	194.8	111.7	**42.7%**	**42%**	**26%**

Cold Face Temperature (°C)
This shows the theoretical temperature underneath the kiln car base at the peak firing temperature.

Heat Flow (W/m2)
This compares the amount of heat flowing through the base of the kiln car in the original construction with that of the modified (Ultralite) construction. The % saving in

Heat Stored W/m2)
This compares the amount of heat stored within the base of the kiln car in the original construction with that of the modified (Ultralite) construction. The % saving in energy through the kiln car base is shown.

% Saving Over Firing Cycle
This shows the combined effect of the savings in energy through the kiln car base over the firing cycle of the kiln.

Recommendations

It is essential that the kiln car bases are constructed to accept the **Ultralite™** loose fill material. Normally a periphery wall would be constructed around the perimeter of each car for retention purposes.

Thermal Calculation Disclaimer

The information provided by Mantec Technical Ceramics Limited within this illustration is an estimation of the potential savings that can be obtained by the adoption of the Ultralite™ technology.
The energy savings stated are theoretical through the kiln car base only. We have used information provided by our industry sector clients where available, and / or have inserted our own information based on "best available data" as a basis on which to run the energy saving program. All cost saving information is provided in good faith, 'without prejudice' but is not guaranteed.

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