Thermal conductivity

Issue: 05/07/2007

Omnia (C.S.) Ltd

Dry freight truck bodies are designed to protect your cargo from the elements. Bodies built according to best practice will indeed protect you cargo for rain, spray, snow, wind etc.

But what about heat?

Heat is transferred through the sheet metal, plywood or sandwich panel. This heat transfer can be specified as the thermal conductivity. Refrigerated truck bodies are built from sandwich panels with insulation foam giving them a very low thermal conductivity. For dry freight the goal is usually not to keep the goods cold. But with the sun shining on the roof the temperatures can get very high and at some point might damage your goods.

Compared to other body building materials for dry freight, the Omnia Panel is an excellent choice to prevent your payload from overheating. The following table shows some comparative values for the thermal conductivity of the material in specific applications.

Body panels	Thermal Conductivity	
	Material coefficient: W/mK	Panel conductivity W/ K per m²
Aluminium (skin 1.5 mm)	200	133,000
Aluminium Cored (10 mm)	(5.2% of 200)	1100
Plywood (18 mm)	0.15	8
Omnia panel (25 mm)	0.10	4

More protection

The coefficient of thermal conductivity is a material property. To calculate the more meaningful thermal conductivity of a sheet or panel (indicated as panel conductivity) you have to divide the coefficient by the thickness of the sheet.

Skin roofs	Thermal Conductivity	
	Material coefficient: W/mK	Panel conductivity W/ K per m²
Aluminium single skin	200	133,000
GRP single skin	6-400 (avg 110)	4000-… (avg 73,000)
Aluminium Cored (10 mm)	(5.2% of 200)	1100
Omnia panel (25 mm)	0.10	4

More protection

So imagine you truck body standing in the sun. The outside skin will get hot very fast. And the higher the thermal conductivity the sooner the inside of the body will be hot as well!

You might think aluminium reflects the light… But actually the protective oxide on the aluminium is an excellent absorber for infrared light (= radiant heat).

The values are based on test results for the core of Omnia panel, Literature values for Aluminium, the conductivity of aluminium core is calculated as a ratio from the density of the core compared to solid aluminium. Values are to our best knowledge and as an indication only.

Source: www.matweb.com

Head Office: Omnia (C.S.) Ltd., PO Box 9455, Nottingham NG1 9EP
Tel +44 (0) 115 937 6666 Fax +44 (0) 115 937 6622 Email: sales@omnia-cs.co.uk Web: www.omnia-cs.co.uk
Registered Office: Charnwood, The Point, Granite Way, Mountsorrel, Loughborough, Leicestershire LE12 7TZ
Reg. Number 05269883 VAT Number 897 7562 45