Institute of Nanoscience and Nanotechnology
Advanced Ceramics and Composites Laboratory
Head: Dr George Vekinis
Tel: +30 210 6503322, Fax: +30 210 6503377
gvekinis@ims.demokritos.gr
http://web.ims.demokritos.gr/Advanced-Ceramics/

NATIONAL CENTER FOR SCIENTIFIC RESEARCH "DEMOKRITOS"
153 10 AG. PARASKEVI ATTIKIS, ATHENS, GREECE POB 60228 TEL. 6503000, FAX 6532649 e-mail: efthi@gel.demokritos.gr

3 March 2016

MONOSI-SYSKEVASIA SA
70km Nat. Road Athens-Lamia
Avlida Chalkidas, Evia
34100
Greece
monosi@otenet.gr

INTERNAL HEATING CURVES IN AN EXPANDED POLYSTYRENE CONTAINER No5

Introduction:

On 25 February 2016, 4 expanded polystyrene containers No5, of external dimensions 370mm x 255mm x 160mm, wall thickness 16.5mm containing 4 x 500g packs ice-packs marked "Plastica" were received from MONOSI-SYSKEVASIA SA for thermal insulation tests over 48 hours.

Method:

The thermal insulation tests were carried out in an environment controlled chamber of internal dimensions about 400 x 350 x 300mm under constant temperature conditions without air circulation.

One expanded polystyrene container was loaded with 2 bottles (500g each) of water at a temperature of 3±1°C and 4 "Plastica" ice packs (2kg in total, gel) at -15±1°C arranged as shown in Figure 1. The container was closed with its cover and placed inside the closed chamber (Figure 2). The temperature of the water in the bottles (T_{water}) and that of the environment inside the chamber, above the container (T_{env}) was monitored using type K thermocouples and the T vs time curves were recorded in a computer over more than 48 hours. Two tests were carried out, at T_{env}=22±1°C and at T_{env}=27±1°C.

Figure 1. The packing arrangement in the expanded polystyrene container. T_{water} was monitored by placing a type K thermocouple directly inside the water, through a small hole in one of the bottles.