



Polg. Ind. San Miguel Nave 7B
Crta Alcalá-Daganzo Km 3,2
Alcalá de Henares – Madrid – España
Telf: 91 888 07 38 Fax: 91 881 49 89
Web: www.optimersystem.com
Email: optimizer@optimersystem.com

Aislamientos Reflectivos

S. MASHIACH, M.Sc.
CONSULTANT IN ACOUSTICS AND ELECTROACOUSTICS

31 EDER ST. HAIFA 34752, ISRAEL TEL. 04-8244856

DATE 22.3.91

To:
POLYON INDUSTRIES
KIBBUTZ BARKAI

Dear Sirs,

Re: Acoustic absorption properties of triple layer Polynum type material

I have reviewed the test results of your triple layer material of the Polynum type, as performed by Dr. Clair at the National Institute of Building Research.

For practical purposes the noise absorption coefficient of material is defined as a single number called N.C.R. (NOISE REDUCTION COEFFICIENT), which is the arithmetical average of acoustic absorption at 250, 500, 1000, 2000 hertz at octave intervals.

Dr. Clair's test results show:

The absorption at 250 hertz is the average at frequencies of 200, 250, 315 - therefore the average absorption is 20.3%.

The absorption at 500 hertz is the average absorption of 400, 500, and 630 hertz - therefore 28%.

The absorption at 1000 hertz is the average absorption of 800, 1000, 1250 hertz or 77.8%.

The absorption at 2000 hertz is the average absorption of 1600, 2000, 2500 hertz or 55.6%.

Therefore the N.R.C. of your material is 0.45, which is a medium noise reduction coefficient but has significant acoustic effect.

Dr. Clair performed the test of absorption qualities of the material in a standing wave pipe, in which the audio waves contact the absorption material perpendicular to the material. The absorption of the absorbing material in actuality, since in fact acoustic energy contacts materials at various angles, is higher by approximately 20%, and it is unclear to me if this relationship functions with your material as well because it is not thick material, yet one can expect that the absorption faculty of the material will be at least 10% more in actuality than in the standing wave pipe.

Therefore it can be written $N.R.C = 0.45$ (in standing wave pipe).

$0.5 = N.R.C$ (provided that it is as composed at site).

By comparison the absorption coefficient of a fiberglass acoustic ceiling is $N.R.C = 0.65 - 0.75$.

Thus your material falls from the absorption of a standard acoustic ceiling by 25 - 30%, yet as stated the acoustic effect obtained by it's installation (in addition to the thermal effect) in sport centers, production areas, etc. is significant.

Sincerely,

S. Mashiach



Polg. Ind. San Miguel Nave 7B
 Crta Alcalá-Daganzo Km 3,2
 Alcalá de Henares – Madrid – España
 Telf: 91 888 07 38 Fax: 91 881 49 89
 Web: www.optimersystem.com
 Email: optimer@optimersystem.com

Aislamientos Reflectivos

Funded by
 MINISTRY OF CONSTRUCTION AND HOUSING
 TECHNION: ISRAEL INSTITUTE OF TECHNOLOGY
 Faculty of Civil Engineering

NATIONAL
 BUILDING
 RESEARCH
 INSTITUTE

Date: 7.16.90
 Document: 4.5(1155)

To:
 Polyon, Ltd.
 Kibbutz Barkai
 M.P. 37860

Dear Sirs,

Re: Absorption Properties Tests of "Polynum" Material

As per your order, measurements of absorption capabilities were done on two types of "Polynum". The tests were performed with the use of a standing wave pipe, in which the material tested was installed at a distance of 50 m"m from the end of the rigid pipe.

The test results were recorded in a table:

Material	100	125	160	200	200	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000
triple layer	10	11	15	18	23	20	26	28	30	63	80	90	65	57	45	37	30
double layer	20	24	25	24	23	14	12	35	44	54	35	35	22	30	50	42	46

Based on an analysis of the measurements the following conclusions can be made:

1. In the low frequency range (100Hz - 500 Hz) the absorption capabilities of the two materials are relatively low, although the six layer material is more effective.
2. In the medium frequency range 630Hz - 1250Hz, the triple layer materials show high absorption qualities. The material, with six layers returns the sound waves that contact the rigid layer, and therefore it's absorption qualities are much lower than those of the triple layer material, which turns to the sound waves with air bubbles wrapped in very thin polyethylene.

Sincerely,

Dr. Yuli Clair

yk/dm

National Building Research Institute, Technion City, Haifa 32000, Israel
 Fax: 972 - 4 - 324534 Tel: 04-292242