

**Intervention n°716/PD completed on October 30, 2003**  
**Purchaser: Pontarolo Engineering s.r.l.**  
**Yard: Via Clauzetto –San Vito al Tagliamento ( PN ) Italy**



Purchaser	Pontarolo Engineering s.r.l.		
Archives	Relazioni/Martinetti/716 Pontarolo.doc		
Executed	30 October 2003	Offer	
Lay out	31 October 2003	Operator	ML
Technical Report done by:	Dr. Ing. Manuel Levorato		
Typology codes of research: MART	Purchaser Responsible: Ezio Giuffrè		

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**ATTACHMENT: Photo Gallery**

### ***1. Introduction***

Present on the 30th of October, 2003 at the yard in Via Clauzetto 1 Industrial Zone Ponte Rosso in San Vito al Tagliamento (PN)

- A. Comisini                      Engineer – Pontarolo Engineering s.r.l.
- M. Levorato                     Engineer– Metralab.

Ezio Giuffrè of Metrolab on request by Pontarolo Engineering s.r.l., performed Loading test on the structure denominated Cupolex, manufactured by Pontarolo.

Through this enquiry the stress of the structure has been tested as well as the breaking load test.

A. Comisini P.Eng has viewed the elements to be tested and the enquiry.

The present technical report is composed of 11 pages and divided into General Index, Introduction, Structure Description, Test Description and a Summary of the Results. Drawing, graphics and other test elaboration are inserted in the attachments .

**General Notes** –*Ezio Giuffrè of Metrolab* assumes all responsibility for the precision of the measurements conducted and guarantees that all equipment is tested periodically .

A copy of this document will be archived on paper and on computer at *Metrolab* under the name of “716 Pontarolo doc.” and will be conserved for at least ten years.

## ***2. Structure Description***

The test structures are elements denominated CUPOLEX® comprised of recycled polypropylene polymers for the creation of an aerated flooring system.

The dimensions of these elements in plan view are 560mm x 560mm in various heights. The elements are joined together to give a self-bearing structure .

The elements tested have a height measurement in the center.

## ***3. Test Description***

The tests have been performed to determine the movement and load breaking strength of each element tested.

The tests have been conducted in two phases: The first by applying gradual loads and increasing the load at intervals in the center of three elements. The second test was conducted by applying the same loading but eccentric.

Between the element to be tested and the testing machine there is a hydraulic jack (model CRM 5/100 with a section 7, 10 cm<sup>2</sup> ) connected with a manometer to read the pressure transmitted to the structure.

The loading test has been done with an application of only one course load until breakage occurred.

## *Observation*

### *1° Cupolex 20 – Load: Central*

Pressure manometer Metralab [bar]	Load Apply [daN]	Down load. In the Application point . [mm]	Pressure manometer Pontarolo [bar]	Time [hh.mm]	Note
0,0	0,0	0	0	13.00	ZERO
3,5	24,9	9	1	13.06	
8,5	60,4	12	2	13.09	
12,5	88,8	13,5	3	13.10	
17,5	124,3	14,5	4	13.11	
23,5	166,9	16	5	13.12	
27,0	191,7	17	6	13.14	
29,5	209,5	19	7	13.17	
37,5	266,3	22	8	13.18	
42,5	301,8	22	9	13.19	
47,5	337,3	23	10	13.20	
50,0	355,0	23,5	11	13.22	
55,5	394,1	24	12	13.23	
59,5	422,5	26,5	13	13.24	
67,5	479,3	28	14	13.26	
71,5	507,7	30	15	13.27	
75,5	536,1	58	> 15	13.30	Break

## *2° Cupolex 20 – Load: Central*

Pressure manometer Metralab [bar]	Load Apply [daN]	Down load. In the Application point . [mm]	Pressure manometer Pontarolo [bar]	Time [hh.mm]	Note
0,0	0,0	0	0	13.41	ZERO
4,0	28,4	12,5	1	13.42	
7,5	53,3	15	2	13.43	
13,0	92,3	16,5	3	13.44	
17,0	120,7	17,5	4	13.45	
23,0	163,3	18,5	5	13.46	
27,5	195,3	20	6	13.46	
31,0	220,1	22,5	7	13.47	
38,5	273,4	24,5	8	13.48	
44,0	312,4	25,5	9	13.50	
48,5	344,4	26	10	13.51	
53,5	379,9	26,5	11	13.51	
57,0	404,7	28,5	12	13.52	
62,0	440,2	29,5	13	13.53	
66,5	472,2	30,5	14	13.54	
70,5	500,6	32	15	13.55	
72,0	511,2	38	> 15	13.56	break

## *3° Cupolex 20 – Load: Central*

Pressure manometer Metralab [bar]	Load Apply [daN]	Down load. In the Application point . [mm]	Pressure manometer Pontarolo [bar]	Time [hh.mm]	Note
0,0	0,0	0	0	14,07	ZERO
6,5	46,2	14	1	14,08	
10,0	71,0	15,5	2	14,09	
14,0	99,4	16,5	3	14,10	
18,5	131,4	17,5	4	14,11	
23,0	163,3	19	5	14,12	
27,0	191,7	20,5	6	14,13	
32,0	227,2	24	7	14,13	
39,0	276,9	25	8	14,14	
44,5	316,0	25,5	9	14,14	
49,0	347,9	26	10	14,15	
53,5	379,9	27	11	14,16	
57,5	408,3	28,5	12	14,17	
64,0	454,4	29,5	13	14,18	
68,0	482,8	31	14	14,19	
73,0	518,3	32	15	14,20	
75,0	532,5	34	> 15	14,22	
90,0	639,0	39	> 15	14,25	break

### *4° Cupolex 20 – Load: eccentric*

Pressure manometer Metralab [bar]	Load Apply [daN]	Down load. In the Application point . [mm]	Pressure manometer Pontarolo [bar]	Time [hh.mm]	Note
0,0	0,0	0	0	16,49	ZERO
1,5	10,7	2	0,5	16,50	
4,5	32,0	6,5	1	16,51	
7,0	49,7	8	1,5	16,52	
8,5	60,4	9	2	16,53	
12,0	85,2	10	2,5	16,53	
13,5	95,9	11,5	3	16,55	
16,0	113,6	12	3,5	16,56	
17,0	120,7	12,5	3,75	16,57	
17,5	124,3	13,5	4	16,58	
19,0	134,9	14	4,25	16,59	
20,0	142,0	14,5	4,5	17,00	
21,0	149,1	15,5	4,75	17,01	
21,3	150,9	16,5	5	17,02	
24,0	170,4	19	5,5	17,03	
26,0	184,6	20	6	17,04	
27,8	197,0	21	6,5	17,05	
30,5	216,6	21,5	7	17,05	
32,5	230,8	22,5	7,5	17,06	
34,0	241,4	23	7,7	17,07	1 break
36,0	255,6	25,5	8	17,08	
38,5	273,4	26,5	9	17,09	
40,0	284,0		10	17,09	Complete break

### *5° Cupolex 20 – Load: eccentric*

Pressure manometer Metralab [bar]	Load Apply [daN]	Down load. In the Application point . [mm]	Pressure manometer Pontarolo [bar]	Time [hh.mm]	Note
0,0	0,0	0	0,00	17,16	ZERO
8,0	56,8	9	1,00	17,17	
9,5	67,5	11	2,00	17,17	
14,0	99,4	12,7	3,00	17,18	
16,0	113,6	13,5	3,50	17,18	
17,5	124,3	14	4,00	17,19	
19,0	134,9	15	4,50	17,19	
21,0	149,1	16	5,00	17,19	
23,0	163,3	17,5	5,50	17,20	
25,5	181,1	20,5	6,00	17,20	
28,5	202,4	22	6,50	17,20	
30,0	213,0	23	7,00	17,21	
31,0	220,1	23,5	7,25	17,21	
32,5	230,8	24,5	7,50	17,21	
33,0	234,3	26	7,60	17,22	break

### *6° Cupolex 20 – Load: eccentric*

Pressure manometer Metralab [bar]	Load Apply [daN]	Down load. In the Application point . [mm]	Pressure manometer Pontarolo [bar]	Time [hh.mm]	Note
0,0	0,0	0	0,00	17,27	ZERO
5,5	39,1	7	1,00	17,27	
9,0	63,9	9	2,00	17,28	
13,0	92,3	12	3,00	17,29	
17,0	120,7	14	4,00	17,29	
22,0	156,2		5,00	17,30	break

## 4. Summary of the Results

Description	Cupolex 1	Cupolex 2	Cupolex 3	Cupolex 4	Cupolex 5	Cupolex 6	u.m.
Type of load	central	central	central	eccentr.	eccentr.	eccentr.	-
Max breaking pressure (Metralab)	75.5	72	90	40	33	22	(bar)
Max load apply at break point	536.1	511.2	639	284	234.3	156.2	(daN)
Down load in the apply point	58	38	39	>26.5	26	>14	(mm)



## *Photo Gallery*





