

Quality by Integrity and Knowledge

## Report of Load Testing on Pipe Plugs

Tested For: Taylor Made Plastics  
203 South Manatee Avenue  
Arcadia, FL 34266  
Attn: Bob Taylor

Lab No. 990209

Date: March 4, 1999

Work Order 99-9110

On February 9, 1999, the NDT Group's Physical Testing Department received the following material to perform load testing on pipe plugs as outlined.

1. 2, 48" diameter pipe plugs, one (1) foam filled
2. 2, 36" diameter pipe plugs, one (1) foam filled
3. 2, 24" diameter pipe plugs, one (1) foam filled
4. 2, 15" diameter pipe plugs, one (1) foam filled
5. 2 pieces of 48" diameter corrugated plastic pipe
6. 2 pieces of 36" diameter corrugated plastic pipe
7. 2 pieces of 24" diameter corrugated plastic pipe
7. 2 pieces of 15" diameter corrugated plastic pipe

We were requested to perform a vertical load test and a vertical/horizontal load test on each of the above pipe plugs.

Following are the results.

### Vertical Load Test

For the testing, a 12" length of pipe for the 15" to 36" diameter plugs was cut and a 30" length was prepared for the 48" diameter plug. A loading device for each size was made to load around the handle and not at the edge (2" from the edge for the 15" diameter; 6" from the edge for the 24"; 12" from the edge for the 36" diameter; and 24" for the 48" diameter).

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The pipe was then placed on the platen of our Tinius Olsen 1.2 million pound testing machine. The plug was placed into the pipe. The loading device was placed on the plug and loaded until fracture.

Following are the results:

Sample ID	Maximum Load-Pounds	Comments
15" No Foam	2500	Plug pushed into pipe
15" Foam Filled	4850	Plug pushed into pipe
24" No Foam	2500	Plug pushed into pipe
24" Foam Filled	5250	Plug pushed into pipe
36" No Foam	4900	Plug pushed into pipe
36" Foam Filled	10100	Plug pushed into pipe
48" No Foam	9500	Plug pushed into pipe
48" Foam Filled	18750	Plug broke

For the non-filled plugs, #10 x 2" long screws were placed at 3; 6; 9; and 12 o'clock.

#### Horizontal/Vertical Load Test

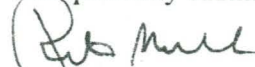
For the testing, a 30" long length of pipe was prepared for each size. The loading devices used for the vertical testing were also used for this testing. The plug was then placed into the pipe and then laid horizontally on the platen of the testing machine between the columns of the machine. The open pipe end beared against the column. A jack assembly was then positioned against the other column of the testing at the center line of the plug. The pipe was then deflected 10% of pipe diameter by using the crosshead of the testing machine. At this point, the jack was used to load the plug.

Following are the results:

Sample ID	Pipe Deflection-Inch	Maximum Load-Pound	Comments
15" No Foam	1.5	1870	Plug pushed in
15" Foam Filled	1.5	2330	Plug pushed in
24" No Foam	2.4	2330	Plug pushed in
24" Foam Filled	2.4	2370	Plug pushed in
36" No Foam	3.6	4350	Plug pushed in
36" Foam Filled	3.6	5800	Plug pushed in
48" No Foam	4.8	11550	Plug pushed in
48" Foam Filled	4.8	17500	Plug pushed in

Note: Plug deformed out as 10% deflection.

Respectfully submitted,



J. Peter Merther, PE

Non-Destructive Testing Group, Inc.

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Sample ID	Outside Dia. Inch	Inside Dia. Inch	Bearing Area Square Inch	Maximum Load Pound	Bearing Stress Psi
15" No Foam	16-3/4	14-1/16	67.04	2500	37.3
15" Foam Filled	16-3/4	14-1/16	67.04	4800	71.6
24" No Foam	26	23	115.45	2500	21.7
24" Foam Filled	26	23	115.45	5250	45.5
36" No Foam	37-1/4	34-3/4	141.37	4900	34.7
36" Foam Filled	37-1/4	34-3/4	141.37	10100	71.4
48" No Foam	51-3/4	46-1/8	432.39	9500	21.9
48" Foam Filled	51-3/4	46-1/8	432.39	18750	43.4