

Laboratory Tests Verify Increased Collapse Strength of Louver Perforated Well Screens

Introduction

Roscoe Moss Company (RMC) manufactures louvered well screen from coiled steel which it spiral-welds to form a tubular pipe (i.e., blank casing) product. After trimming and attaching welding collars (if so requested), the blank pipe is next perforated to create louvered well screen, which is available in three louvered patterns: Standard Flo, Ful Flo, and Super Flo.

In a series of tests conducted by Smith Emery Company (SEC), the collapse strengths of blank casing, and three types of louvered screen: Standard Flo, Ful Flo, and Super Flo were investigated. Subsequently, a second series of tests was conducted to compare the tensile strengths and collapse strengths of Super Flo louvered screen and continuous wire-wrapped screen. The results, as shown here, revealed interesting changes in the collapse strengths as described below.

Louvered Screen Tests

SEC tested the collapse strengths of two samples each of 12.75" OD blank casing and 12.75" OD Standard Flo, Ful Flo, and Super Flo louvered screens. The wall thickness of each sample was 0.188". The tests were conducted using ASTM 3 Edge-Bearing Method, described as a crushing strength test; however it measures the collapse strength equivalent to hydrostatic pressure collapse. The results show that compared to blank casing the collapse strengths of all three louvered screens were greater than that of their "parent" blank casing. Standard Flo screen was 25% stronger. Ful Flo screen was 36% stronger. And, Super Flo was 62% stronger.

Louvered Screen and Continuous Wire-Wrapped Screen Tests

The second series of tests was conducted on two samples of 12.75" OD Super Flo screen with wall thickness of 0.188" and two samples of 12" pipe-size, continuous wire-wrapped screen (CWWS) of "standard construction". Crushing strength tests were performed as per ASTM 3 Method. Table 1 results show that the Super Flo screen is about 10% greater than CWWS. This table also shows that the strengths of Standard Flo, Ful Flo, and Super Flo each exceed that of blank casing. These increases are a direct result of the louver perforating process. It is interesting to note that the increases in collapse strengths that were imparted to the screens are about the same percentage no matter what the wall thickness.

Table 1

	Blank Casing	Standard Flo	Ful Flo	Super Flo	Continuous Wire-Wrapped Screen *
Wall Thickness	Collapse Pressure (psi)				
0.188"	163	203	221	264	237
0.250"	388	485	528		
0.313"	755	943	1040		

*Wall thickness does not apply

The results of the crushing strength tests show that CWWS is 45% stronger than 12.75" OD blank casing. Ful Flo louvered screen collapses at 528 psi, more than double the strength of 12" CWWS. 12.75" OD, 0.313" wall thickness, Ful Flo louvered screen is 4 times stronger than 12" CWWS. The crushing strength of the Standard Flo screen with the same wall thickness (0.313") is slightly less than the Ful Flo.

It should be pointed out that it is only possible to generalize the relationships shown above because the collapse strength of CWWS depends upon the slot size, shape, and size of the material used in its construction. One would expect to see differences in strengths between CWWS and louvered screen due to the diameters. Nevertheless, the considerable superiority of louvered screen always exists.

References

- Roscoe Moss Company, 1990, *Handbook of Ground Water Development*, John Wiley and Sons, New York, NY.
- Internal Memorandum dated July 18, 1990

About the Author

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