

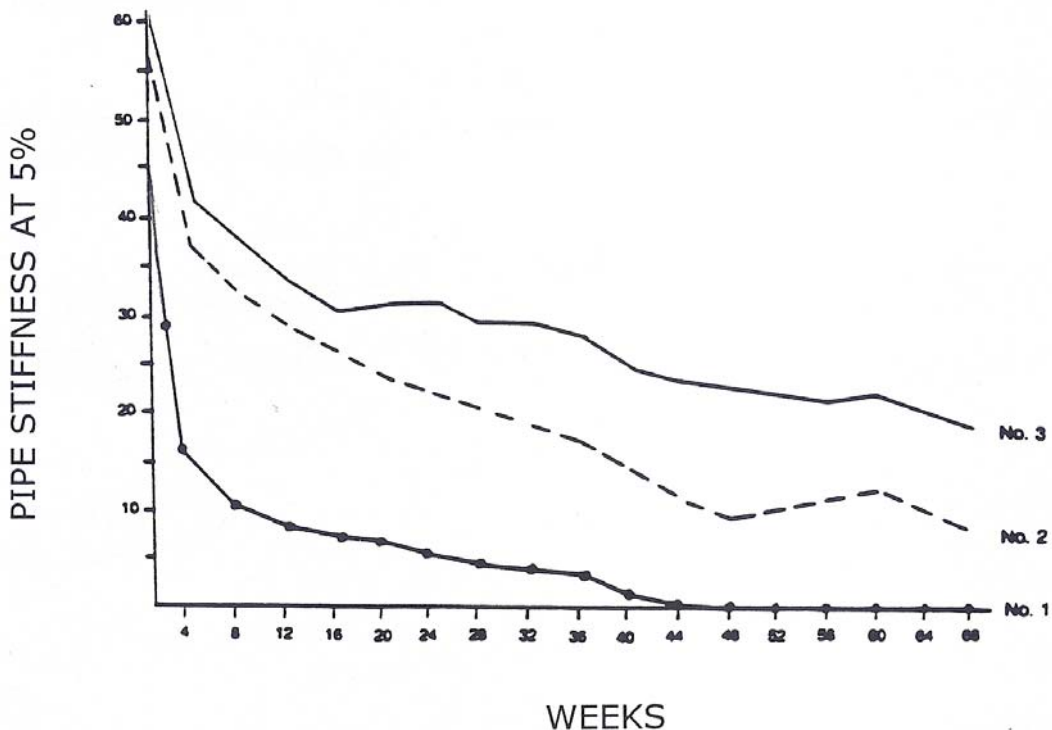
PVC PIPE LOSES STRENGTH AT CONSTANT DEFLECTION

In order to determine the physical performance of Poly Vinyl Chloride (PVC) sewer pipe with moderate to high filler content, a series of long term and short term test were performed.⁽¹⁾

Three samples of each pipe were loaded such to maintain a constant deflection, the load was recorded at different time intervals, and the pipe stiffness at 5% deflection was determined.⁽²⁾ **Results showed that the Pipe Stiffness continued to decrease during the life of the 68 week testing program.**

Specimen Number	Product Name	Pipe Stiffness		Stiffness Decrease
		Start	End	
1	Carlton Prime Z-46	46	0*	100%
2	Certain-Teed SDR 35	57	8.7	84.7%
3	Johns-Manville SDR 35	62	19.0	69.4%

*Pipe Stiffness dropped from 46 psi to 0 psi in 56 weeks.



One of the purposes of the testing program was to evaluate the effect of fillers in PVC resins on long-term pipe stiffness. Specimen No. 1 had 37.4% fillers, Specimen No. 2 had 5.4%, and Specimen No. 3 had 14.3% fillers. It was determined by spectrographic analysis that the filler material was calcium carbonate (limestone).

CONCLUSIONS

Poly vinyl chloride (PVC) pipe strengths are time dependent, **decreasing with time**, and affected by the filler content used in the resin. **Long-term pipe strengths are significantly less than initial strengths.**

Engineers should not assume the long term performance of PVC products are the same, but should require testing of the product to evaluate long term characteristics.

REFERENCES

- (1) NCPI Research Report No. 142, "The Influence of Fillers on the Performance of PVC Sewer Pipe", National Clay Pipe Institute, Edward J. Sikora, September 15, 1985.
- (2) Test samples were from commercially available pipe produced by three different manufacturers. All pipes had a minimum Pipe Stiffness (PS) of 46 psi. Ash content was determined by ASTM D 817 and spectrographic analysis.