



# Certa-Lok® Joint Tensile Strength Testing

## Purpose of Maximum Tensile Force

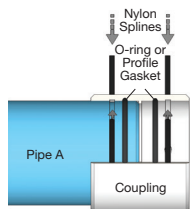
Certa-Lok joints are internally restrained in both directions. Certa-Lok includes the Restrained Joint (RJ) coupled style products and the Restrained Joint Integral Bell (RJIB) bell and spigot style products. Certa-Lok joints are capable of withstanding large axial forces, and are designed and subjected to several industry standard testing procedures including: ASTM D1598 (*Time-to-Failure of Plastic Pipe Under Constant Internal Pressure*), ASTM D1599 (*Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings*), and ASTM D3139 (*Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals*). In addition to these tests, Certa-Lok joints are tensile tested to failure.

## Typical Pull Force Chart

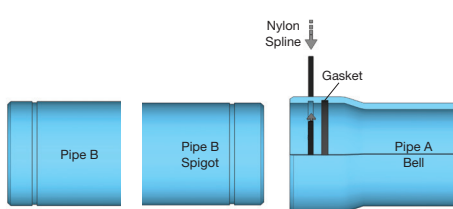
The “Joint Performance Data” can be found in the applicable Certa-Lok Product Specifications.

JOINT PERFORMANCE DATA				
Nom. Size	DR	Pressure Class (psi)	Min. Bend Radius (ft)	Max. Pull Force (lbf)
4"	18	235	100	7,800
	14	305		9,800
6"	18	235	144	16,000
	14	305		18,900
8"	18	235	188	23,100
	14	305		24,300
10"	18	235	232	40,500
	14	305		48,700
12"	18	235	275	50,500
	14	305		53,800
16"	25	165	363	68,500
	18	235		72,000

## Certa-Lok Coupling



## Certa-Lok RJIB



## Tensile Testing Process

Certa-Lok joint assemblies are tensile tested during development and product qualification to quantify their maximum allowable pull force. Certa-Lok RJ coupling and RJIB test assemblies are restrained via internal splines. Once the test assembly is secured, the two ends are pulled apart until failure occurs. The force applied on the assembly is constantly measured; therefore, the force at failure<sup>1</sup> is captured.

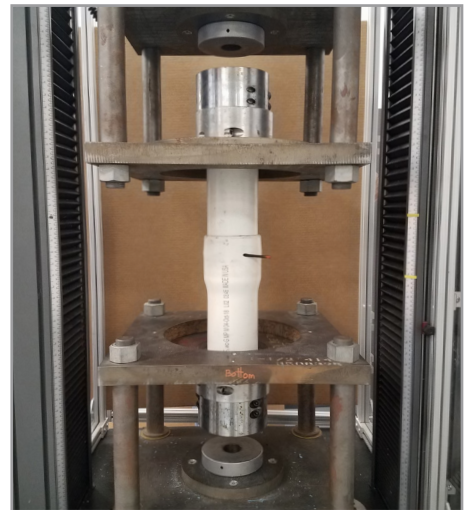
The maximum pull force is determined by tensile testing a sample set of Certa-Lok joints to failure, and dividing the average force

(lbf) at failure by a Safety Factor of at least 2.0<sup>2</sup>. Testing is done by NAPCO and at Third Party Test facilities. There is currently no testing standard for internally restrained joints<sup>3</sup>.

## Certa-Lok Coupling Test Setup – Post Failure



## Certa-Lok RJIB Test Setup



<sup>1</sup> Instances of failure include two ends pulled apart, cracking of the pipe or coupling, failure at a spline, or a catastrophic failure of the pipe or coupling occurs.

<sup>2</sup> The actual force (lbf) at failure value is at least 2.0 times greater than the allowable maximum pull force, unless otherwise noted.

<sup>3</sup> Refer to ASTM D1674 for external joints only.

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