



What is Elongation?

What is Elongation in Industrial Rubber Products?

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Elongation is the percentage a rubber product can stretch beyond its original length before it breaks.

It matters most in dynamic applications, anywhere a rubber part is repeatedly flexed or stretched. Higher elongation generally means better cycle life those applications, which is why you'll see it specified for seals, pump parts, inflatable seals, expansion joints and other products under regular dynamic pressure.

Even a static application can benefit from high elongation if the part gets stretched or contorted during installation, as that stretch resistance is what keeps it from breaking before it ever gets to do its job.

How is Elongation Tested?

An industry standard for testing elongation is ASTM D412. This specification covers the methodology for testing both elongation and tensile strength in industrial rubber products.

The test uses a dog-bone-shaped sample, pulled by a tensiometer until it snaps. At the break point, the machine records both tensile strength and elongation at the same time. This is why elongation specifications are often written as "Ultimate Elongation at Break".

Which Rubber Materials Have High Elongation?

Compounding can push elongation higher or lower across nearly any polymer, but Natural Rubber, Butyl, EPDM, Nitrile, and Neoprene are the materials with an established advantage.

Natural Rubber	Butyl	Neoprene	EPDM	Nitrile (NBR, Buna-N)
500% to 900%	300% to 850%	100% to 800%	100% to 700%	400% to 600%

Looking for Rubber With High Elongation?

Established in 1910, WARCO is a 100% USA manufacturer of high-performance, custom rubber parts for demanding industrial applications, including formulation and manufacturing of high-elongation rubber products.

Our in-house lab covers a wide range of testing to help you select the right material for your application. Questions about elongation for your specific use case? Reach our technical sales team at sales@warco.com or (714) 532-3355.



Commonly Asked Questions about Elongation

- 1. What is the difference between elongation and tensile strength?**
 Elongation measures how far a compound stretches before it breaks; tensile strength measures how much force it takes to break it. One is about length, the other is about force.
- 2. What are potential tradeoffs when working with high elongation rubber?**
 Higher-elongation compounds tend to run softer and have lower tensile strength and modulus. This can make it less resistant to abrasion, tearing, and permanent deformation under load. Be sure to note your full requirements to your rubber manufacturer, so that the chemist can formulate to all relevant factors.
- 3. What is considered high rubber elongation?**

Rubber materials with 500% or greater, at break, is the general industry threshold for "high elongation."

4. Which rubber elastomer has the highest elongation?

Natural rubber is well-known to have one of the highest elongation percentages, with the ability to be compounded to stretch 900% of it's original length.

5. What is the difference between elongation vs compression set?

Elongation measures stretch, Compression Set measures recovery. Elongation typically matters for parts that flex, like seals and diaphragms. Compression set is more relevant for parts that just sit under pressure, like O-rings and gaskets.

6. Which rubber elastomer has the lowest elongation?

Although it has great chemical and heat resistances, FKM/Viton™ is known to not have particularly high elongation, with a percentage range of 125% to 400%.