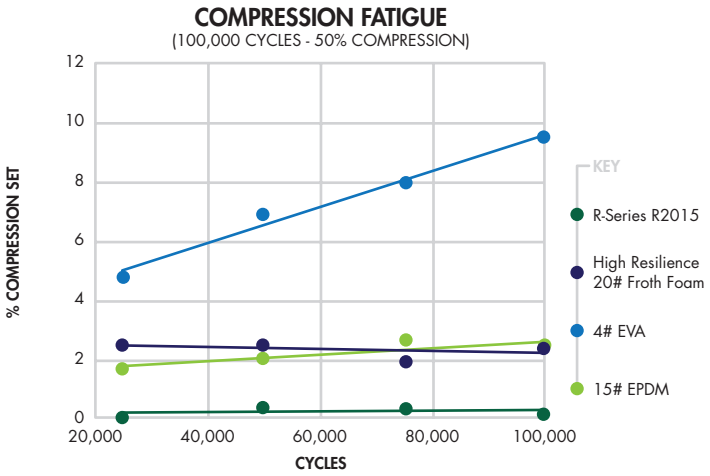
# HyPUR-cel® by Rubberlite R-Series

R-Series is a unique polyurethane foam characterized by low hysteresis loss, high resilience, exceptional compression fatigue and compression set characteristics, and outstanding high energy return performance. These characteristics, along with the breathable nature of open-cell polyurethane, makes R-Series a preferred alternative for high performance athletic insoles, gasketing, die ejection, and other demanding applications where resilient energy return is required.

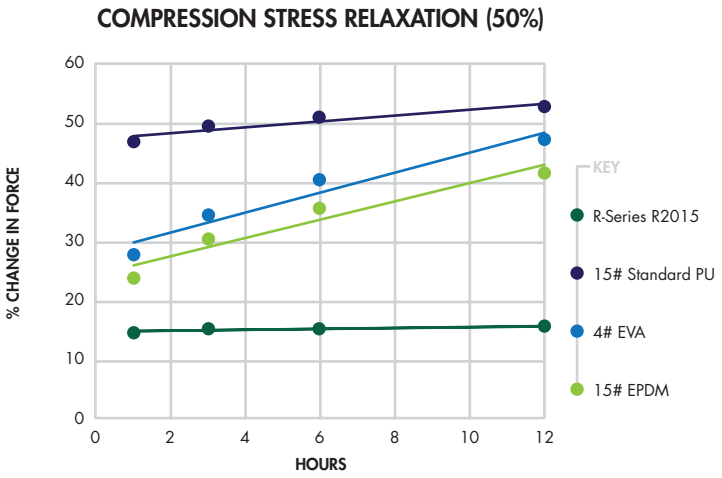
## COMPRESSION FATIGUE

The most visible signature of fatigue is compaction – the material fails to recover to its original thickness after repetitive or long term compression. Compaction is quantified as "compression set", a relationship between the original thickness (T) and the compacted thickness (t), expressed as % loss. Compression set is the result of plastic deformation of cell walls and the reduced resilience of damaged cells. R-Series performance is exceptional with virtually zero compression set or degradation of cellular structure providing a superior alternative for many demanding applications.




## STRESS RELAXATION

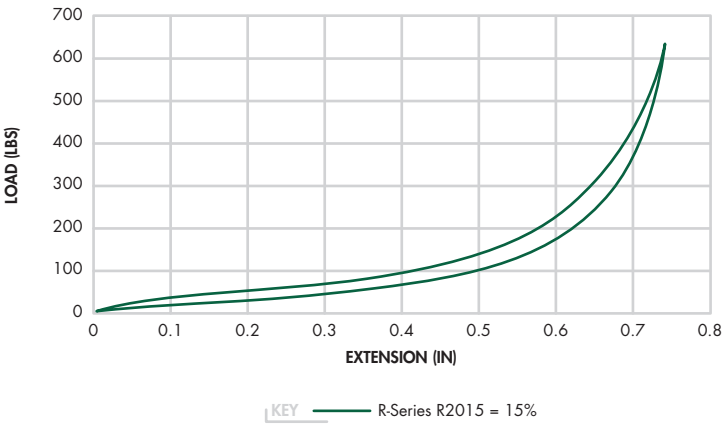
Defined as a gradual decrease in stress with time under a constant deformation or strain. This polymer behavior is studied by applying a constant deformation to the specimen and measuring the stress required to maintain that strain as a function of time. Basically, it quantifies the stress lost by the material over time while maintaining a constant strain. R-Series maintains this stress much longer than standard foams, making it an ideal performance material for demanding gasket and die ejection applications.



## HYSTERESIS LOSS

The measure of the energy lost or absorbed by a foam when deflected by a specified strain and immediately recovered at the same strain rate to its original thickness, it is the area between the loading and unloading curves on a hysteresis loop. R-Series, with a resilience of 50% extraordinary compression resistance properties, exhibits very low hysteresis loss of  just 15% making it an advantaged material for high energy return applications.

**HYSTERESIS LOSS (ASTM D3574)**

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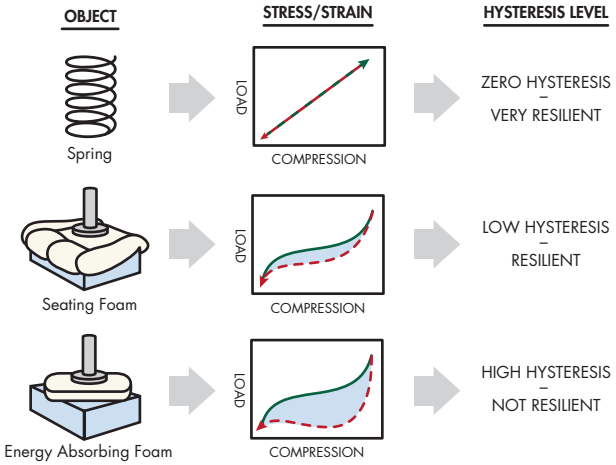


| HYPUR-CEL R-SERIES TYPICAL PROPERTIES | | | | |
|---|---|---|---|---|
| **Physical Property** | **Method** | **R2015** | **R1510** | **R1205** |
| Density (pcf) | ASTM D3574 | 20 | 15 | 12 |
| Compression Deflection 25% | ASTM D1056 | 15 | 10 | 5 |
| CFD 25% (psi) | ASTM D3574 | 15 | 9 | 4 |
| Hysterisis Loss (%) | ASTM D3574 | 15 | 20 | 25 |
| Resilience (%) | ASTM D2632 | 55 | 50 | 42 |
| Compression Set (50%) (%) | ASTM D1056 | 0.5 | 0.5 | 0.5 |
| Compression Set 50% @ 70°C (%) | ASTM D3574 | 2.5 | 3.2 | 3.6 |
| Tensile Strength (psi) | ASTM D3574 | 70 | 57 | 42 |
| Elongation (%) | ASTM D3574 | 130 | 140 | 160 |
| Tear Strength (lb./in) | ASTM D624 | 14 | 9 | 8 |

**Product Availability**
60" wide rolls in 50' and 100' lengths, skived to custom thicknesses.
Available with PSA or laminated fabrics.
Colors and additives, such as anti-microbial, are available depending on volume.

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Rubberlite Incorporated