STRETCH
The percent stretch, usually simply called the stretch, is defined by the diameter of the hardware minus the O-ring inner diameter (ID), all divided by the O-ring ID. The diameter of the hardware value represents the diameter the O-ring is being stretched about. For male designs, this diameter is the groove. For female designs, it is the rod. For face seals, this can be the ID of the groove. This formula can also be used for installation stretch where the hardware diameter is the outer diameter of the installation tool or the maximum diameter that the O-ring must pass over for installation.
NOTE: Face seals are usually designed with the Groove ID equal to the ORing ID (internal pressure) or Groove OD equal to the the ORing OD (external pressure so stretch/shrink only applies if the Groove ID or OD is modified from these conditions.
Ideal: 0-5%

SQUEEZE
To form a robust seal, adequate compression or squeeze is a critical consideration. Compressing the seal energizes it, and the O-ring pushes back on the mating surfaces. This contact force between the O-ring and hardware creates a seal. Squeeze is calculated by the cross-section diameter minus the gland depth, all divided by the cross-section diameter. Note that in this calculation, the gland depth is the distance from the bottom of the groove to the mating surface. This accounts for any clearance gap.
Ideal: 22-32%

VOLUME FILL
The final essential criterion for O-ring design is volume fill, also called gland fill. The compressed O-ring must have extra space within the groove without overfilling the groove. Volume fill is the O-ring volume divided by the gland volume.
NOTE: Since the volume of the gland is calculated by mulitplying the area of the gland by the circumerence of the gland and the volume of the oring is calculated by multiplying the aread of the oring by the circumference of the centerline of the oring and both circumferences are roughly equal when the oring is compressed in the gland, the Volume Fill is roughly the quotient of the areas.
Ideal: 60-90%

$$\text{Stretch}(\text{ORingID}, \text{GrooveID}) = \frac{\text{GrooveID - ORingID}}{\text{ORingID}} \qquad \text{Squeeze}(\text{ORingCS}, \text{GrooveDepth}) = \frac{\text{ORingCS - GrooveDepth}}{\text{ORingCS}}$$

$$\text{ORingAreaRound}(\text{ORingCS}) = \left(\frac{\text{pi}}{4}\right) * \text{ORingCS}^2 \qquad \text{ORingAreaSquare}(\text{ORingCS}) = \text{ORingCS}^2$$

$$\text{GlandArea}(\text{GrooveDepth}, \text{GrooveWidth}) = \text{GrooveDepth} * \text{GrooveWidth}$$

FOR SQUARE O-RINGS, FACE SEAL, INTERNAL PRESSURE

	Nom	Min	Max	min Tol	max Tol			Stretch (0-5%)	Squeeze (22-32%)	Volume Fill (60-90%)		ORing Area	Gland Area
From inPHorm													
ORring ID	2.500 mm	2.370 mm	2.630 mm	-0.13 mm	0.13 mm		min	75.33%	13.04%	60.46%		0.85 mm^2	1.13 mm^2
ORing CS	1.000 mm	0.920 mm	1.080 mm	-0.08 mm	0.08 mm		nom	-40.00%	25.00%	88.89%		1.00 mm^2	1.13 mm^2
Groove ID	1.500 mm	1.500 mm	1.750 mm	-0.00 mm	0.25 mm		max	35.43%	30.56%	103.68%		1.17 mm^2	1.40 mm^2
Groove Width	1.500 mm	1.500 mm	1.750 mm	-0.00 mm	0.25 mm		inPHorm min						
Groove Depth	0.750 mm	0.750 mm	0.800 mm	-0.00 mm	0.05 mm		inPhormMax						
Modified													
ORring ID	2.500 mm	2.370 mm	2.630 mm	-0.13 mm	0.13 mm		min	7.86%	13.04%	60.46%		0.85 mm^2	1.13 mm^2
ORing CS	1.000 mm	0.920 mm	1.080 mm	-0.08 mm	0.08 mm		nom	-2.46%	25.00%	88.89%		1.00 mm^2	1.13 mm^2
Groove ID	2.438 mm	2.438 mm	2.688 mm	-0.00 mm	0.25 mm		max	-11.84%	30.56%	103.68%		1.17 mm^2	1.40 mm^2
Groove Width	1.500 mm	1.500 mm	1.750 mm	-0.00 mm	0.25 mm		inPHorm min						
Groove Depth	0.750 mm	0.750 mm	0.800 mm	-0.00 mm	0.05 mm		inPhormMax						

References
The Parker O-Ring Handbook ORD 5700

Some summaries here
https://www.gallagherseals.com/blog/how-to-design-o-ring-gland-stretch?srsltid=AfmBOopdY2-1nzLdpUIv2eeZ4DyXf6IrnN1HKR_MgUjlhIAMUFkDazwW

https://www.gallagherseals.com/blog/how-to-design-an-o-ring-gland-compression

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