

**V4004-95 (ED) Explosive Decompression Resistant Compound**

No. 5203B1-USA

*Parker V4004-95 offers exceptional explosive decompression resistance at high temperatures.*

**V4004-95 is ideal for Oilfield Applications**

Compound V4004-95 has been developed for explosive decompression resistance in high-pressure gas service. Explosive decompression is caused when high pressure gas is trapped within the seal. A rapid decrease in external pressure causes the trapped gas to expand creating blisters and ruptures. These blisters and ruptures may be evident on the surface of the seal, they may be internal, or only detected by magnification. Explosive decompression of trapped gasses may cause total physical destruction of the seal. This phenomenon accelerates as temperature rises and the pressure differential across the seal increases. Severe environments, such as those found in down-hole oilfield applications where both extreme pressures and high temperatures are commonplace, can cause this type of seal failure.

**Benefits of V4004-95 Include:**

- Excellent resistance to explosive decompression
- Improved resistance to high-pressure gas environments
- High temperature range (400°F) (204°C)

**Physical Properties:**

<b>Hardness:</b>	<b>95 +/- 5 Shore A Durometer</b>
<b>Tensile:</b>	<b>2900 psi</b>
<b>Elongation:</b>	<b>95%</b>
<b>50% Modulus:</b>	<b>1400 psi.</b>



**Outperforms Competition!**

The degree of explosive decompression resistance a seal material exhibits is dependent upon the material's formulation. A seal material compounded to maximize extrusion resistance for example, may not be resistant to explosive decompression. Test data for compound V4004-95 and a competitor's explosive decompression resistant fluorocarbon will be found on the back page. Note that while both materials exhibit similar performance in Test I and Test II which were performed at 75° F. , at elevated temperatures (Test III), there is a marked difference in performance. Notice the detrimental effect on the competitive material as the temperature is further elevated in Test III. The percentage elongation change for example, is -76% for the competitive seal while only -13% for the Parker V4004-95 material.

**Available Geometry:**

- 8400/8500 Series U-cups
- Standard, Type B and Deep PolyPak
- Custom Molded Shapes



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# **Explosive Decompression Testing Autoclave, CO<sub>2</sub> Environment**

## **Test I**

	<b>Competitive Seal</b>	<b>Parker V4004-95 Seal</b>
Hardness change, Shore M	-10	-3
Volume change, %	+29	+24
Weight change, %	+4	+9
Tensile Strength Change, %	-45	-57
Elongation Change, %	+21	-12
50% Modulus Change, %	-58	-53
Rapid Decompression	Good	Good
820 to 0 psi (20 Second Differential)	Medium swell	Medium swell
Visual Appearance	No damage	No damage

**Test Conditions:**  
75° F.  
1000 ml CO<sub>2</sub>  
820 psi for 120 Hours

## **Test II**

	<b>Competitive Seal</b>	<b>Parker V4004-95 Seal</b>
Hardness change, Shore M	-4	-3
Volume change, %	+2	+3
Weight change, %	+1	+2
Tensile Strength Change, %	-16	-59
Elongation Change, %	13	-32
50% Modulus Change, %	-33	-41
Rapid Decompression	Good	Good
820 to 0 psi (20 Second Differential)	Low swell	Low swell
Visual Appearance	No damage	No damage

**Test Conditions:**  
75° F.  
1000 ml CO<sub>2</sub>  
2500 psi for 120 Hours

## **Test III**

	<b>Competitive Seal</b>	<b>Parker V4004-95 Seal</b>
Hardness change, Shore M	-3	-2
Volume change, %	+2	+3
Weight change, %	+1	+2
Tensile Strength Change, %	-29	-36
Elongation Change, %	-76	-13
50% Modulus Change, %	-30	-34
Rapid Decompression	Fair	Excellent
820 to 0 psi (20 Second Differential)	n/a	Low swell
Visual Appearance	Seal had two splits	No damage

**Test Conditions:**  
250° F.  
1000 ml CO<sub>2</sub>  
1000 psi for 72 Hours

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Test Samples: AS568-227 O-Rings  
\* V4004-95 and V1248-95 are equivalent materials

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