



8B1/8B1T

ELASTOMER O-RING SEALS

Applications

Rugged mechanical seals are available in a wide variety of elastomers for handling practically every industrial fluid. All components are held together by a snap ring in a unitized construction design.

- General industrial applications including chemical processing, food and beverage, petrochemical processing, pharmaceutical, wastewater and power generation.
- Mechanical drive design reduces slippage on shaft and sleeve to eliminate galling and premature wear.
- Lapping process results in high precision finish with optimal flatness.
- Compact design permits use in all types of rotating equipment--centrifugal pumps, mixers and agitators.
- Seals can be repaired easily on-site or at any John Crane Seal Repair Center, and/or converted to wedge-type seals for broader service capabilities.

Operating Conditions

- **Temperatures:** -40°C to 260°C/
-40°F to 500°F
depending on materials used
- **Pressures:** **8B1:** 83 bar g/1200 psig
8B1T: 35 bar g/500 psig
For hydrostatic pressure, see Chart 8
- **Speeds:** Up to 25 m/s / 5000 fpm
For applications with speeds greater than 5000 fpm, a rotating seat (RS) arrangement is recommended.

Fluids

Acids
Aqueous Solutions
Chemicals
Corrosives

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INCH RANGE





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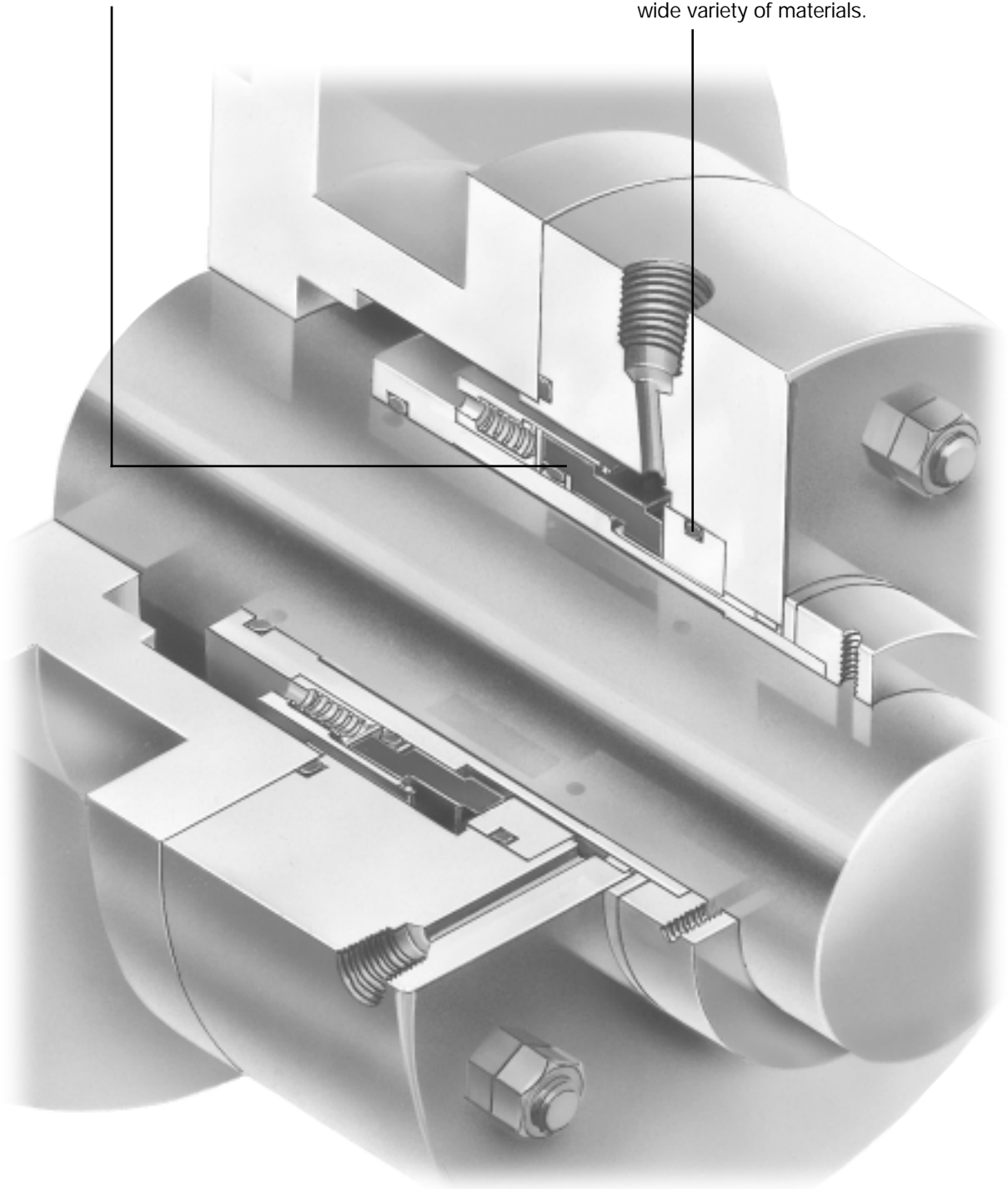
Design Features

Balanced Design

Balanced construction, including anti-extrusion ring, permits use in higher pressures.

O-Ring Design

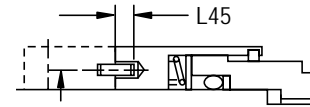
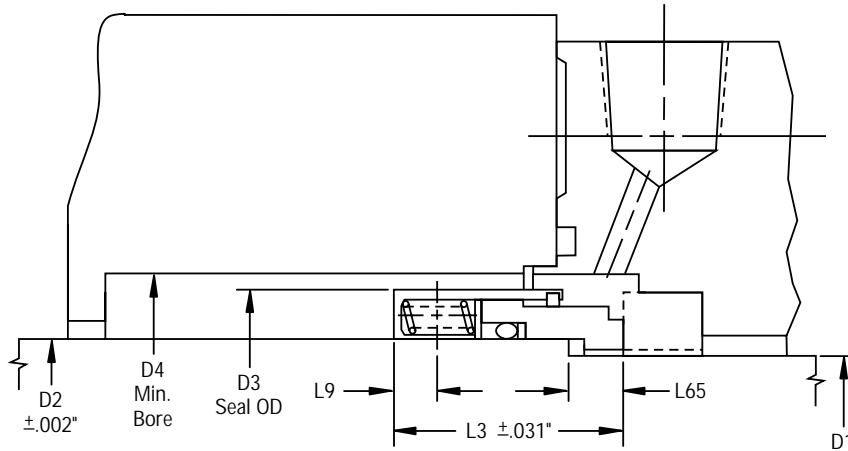
Permits accommodation of many different fluids through use of wide variety of materials.





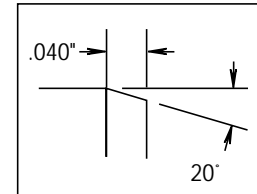
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Type 8B1 Typical Arrangement/Dimensional Data



D11 Pin

(N) number of pins (D12) pin diameter Pin press fit into collar or impeller. Engages holes in retainer. Design option standard on Type 8B1 Seals only.



For ease of installation, the lead-in edge of the shaft or sleeve should be chamfered as shown.

Chart 1. Type 8B1 Dimensional Data (Inches)

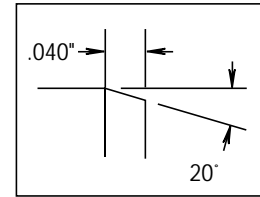
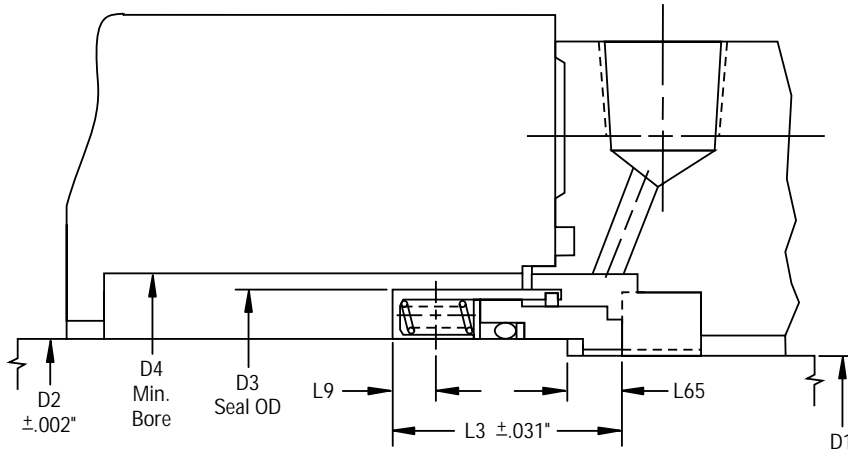
Seal Size (Inches)	D1	D2	D3	D4	D11	D12	L3	L9	L45	L65	N
1.000	.875	1.000	1.562	1.750	1.265	.125	1.312	.187	.125	.343	1
1.125	1.000	1.125	1.687	1.875	1.437	.187	1.375	.218	.187	.343	1
1.250	1.125	1.250	1.875	2.000	1.562	.187	1.375	.187	.187	.343	1
1.375	1.125	1.375	2.000	2.125	1.687	.187	1.437	.187	.187	.343	1
1.500	1.250	1.500	2.125	2.250	1.812	.187	1.437	.187	.187	.343	1
1.625	1.375	1.625	2.375	2.500	2.000	.187	1.750	.281	.187	.437	1
1.750	1.500	1.750	2.500	2.625	2.125	.187	1.750	.281	.187	.437	1
1.875	1.625	1.875	2.625	2.750	2.250	.187	1.750	.281	.187	.437	1
2.000	1.750	2.000	2.750	2.875	2.375	.187	1.750	.281	.187	.437	1
2.125	1.875	2.125	3.000	3.125	2.562	.250	2.062	.343	.250	.500	1
2.250	2.000	2.250	3.125	3.250	2.718	.250	2.062	.343	.250	.500	1
2.375	2.125	2.375	3.250	3.375	2.812	.250	2.062	.343	.250	.500	1
2.500	2.250	2.500	3.375	3.500	2.968	.250	2.062	.343	.250	.500	1
2.625	2.375	2.625	3.500	3.625	3.062	.312	2.062	.343	.312	.500	1
2.750	2.500	2.750	3.625	3.750	3.187	.312	2.062	.343	.312	.500	1
2.875	2.625	2.875	3.750	3.875	3.312	.312	2.062	.343	.312	.500	1
3.000	2.750	3.000	3.812	4.000	3.390	.312	2.062	.343	.312	.500	1
3.125	2.875	3.125	3.937	4.062	3.515	.312	2.062	.343	.312	.562	1
3.250	3.000	3.250	4.125	4.250	3.687	.312	2.062	.343	.312	.562	1
3.375	3.125	3.375	4.250	4.375	3.796	.312	2.062	.343	.312	.562	1
3.500	3.250	3.500	4.375	4.500	3.937	.312	2.062	.343	.312	.562	1
3.625	3.375	3.625	4.500	4.625	4.046	.312	2.062	.343	.312	.562	1
3.750	3.500	3.750	4.625	4.750	4.187	.312	2.062	.343	.312	.562	1
3.875	3.625	3.875	4.750	4.875	4.296	.312	2.062	.343	.312	.562	1
4.000	3.750	4.000	4.875	5.000	4.421	.312	2.062	.343	.312	.562	1
4.125	3.875	4.125	5.000	5.125	-	.312	2.062	.343	.312	.562	1
4.250	4.000	4.250	5.250	5.375	4.781	.187	2.062	.343	.187	.562	1
4.375	4.125	4.375	5.375	5.500	-	.312	2.062	.343	.312	.562	1
4.500	4.250	4.500	5.500	5.625	4.953	.250	2.062	.343	.250	.562	1
4.625	4.375	4.625	5.625	5.750	5.046	.250	2.062	.343	.250	.562	1
4.750	4.500	4.750	5.750	5.875	5.109	.250	2.062	.343	.250	.562	1
4.875	4.625	4.875	5.875	6.000	5.359	.250	2.062	.343	.250	.562	1
5.000	4.750	5.000	6.000	6.125	5.484	.250	2.062	.343	.250	.562	1
5.125	4.875	5.125	6.125	6.250	-	.250	2.062	.343	.250	.562	1
5.250	5.000	5.250	6.500	6.625	5.750	.250	2.375	.312	.250	.625	2
5.375	5.125	5.375	6.625	6.750	-	.250	2.375	.312	.250	.625	2
5.500	5.250	5.500	6.750	6.875	5.984	.250	2.375	.312	.250	.625	2
5.625	5.375	5.625	6.875	7.000	6.109	.250	2.375	.312	.250	.625	2
5.750	5.500	5.750	7.000	7.125	6.250	.250	2.375	.390	.250	.625	2
5.875	5.625	5.875	7.125	7.250	-	.250	2.375	.390	.250	.625	2
6.000	5.750	6.000	7.250	7.375	6.484	.250	2.375	.312	.250	.625	2



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Type 8B1T Typical Arrangement/Dimensional Data



For ease of installation, the lead-in edge of the shaft or sleeve should be chamfered as shown.

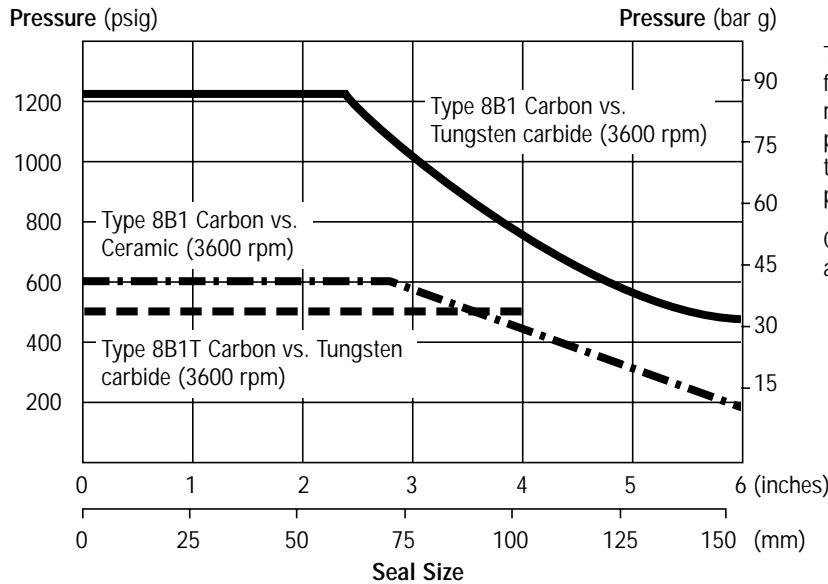
Chart 2. Type 8B1T Dimensional Data (Inches)

Seal Size (Inches)	D1	D2	D3	D4	L3	L9	L65
1.000	.875	1.000	1.437	1.625	1.312	.187	.343
1.125	1.000	1.125	1.562	1.750	1.375	.218	.343
1.250	1.125	1.250	1.687	1.875	1.375	.187	.343
1.375	1.125	1.375	1.937	2.125	1.687	.187	.343
1.500	1.250	1.500	1.937	2.125	1.437	.187	.343
1.625	1.375	1.625	2.250	2.437	1.593	.187	.437
1.750	1.500	1.750	2.312	2.500	1.750	.281	.437
1.875	1.625	1.875	2.500	2.687	1.750	.281	.437
2.000	1.750	2.000	2.625	2.812	1.750	.281	.437
2.125	1.875	2.125	2.812	3.000	2.062	.343	.500
2.250	2.000	2.250	2.843	3.031	1.750	.234	.500
2.375	2.125	2.375	3.000	3.187	2.062	.343	.500
2.500	2.250	2.500	3.125	3.312	1.750	.234	.500
2.625	2.375	2.625	3.250	3.437	2.062	.343	.500
2.750	2.500	2.750	3.375	3.562	2.062	.343	.500
2.875	2.625	2.875	3.500	3.687	2.062	.343	.500
3.000	2.750	3.000	3.625	3.812	2.062	.343	.500
3.125	2.875	3.125	3.750	3.937	2.062	.343	.562
3.250	3.000	3.250	3.875	4.062	2.062	.343	.562
3.375	3.125	3.375	4.000	4.187	2.062	.343	.562
3.500	3.250	3.500	4.125	4.312	2.062	.343	.562
3.625	3.375	3.625	4.250	4.437	2.062	.343	.562
3.750	3.500	3.750	4.375	4.562	2.062	.343	.562
3.875	3.625	3.875	4.500	4.687	2.062	.343	.562
4.000	3.750	4.000	4.625	4.812	2.062	.343	.562



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Chart 3. Pressure/Velocity (PV) Limits



To determine the maximum pressure for the size of Type 8B1 or 8B1T seal required, multiply the maximum pressure by the factors in Chart 4 to obtain the maximum operating pressure.

Consult John Crane Engineering for application outside these limits.

Chart 4. Multiplier Factors

	Selection Considerations	Multiplier
Speed	Up to 3600 rpm	x 1.00
	Above 3600 rpm*	**
Seal Fluid Lubricity	Gasoline, Kerosene or better	x 1.00
	Aqueous solutions	x .60
Sealed Fluid Temperature	Below 79°C/175°F	x 1.00
	Above 79°C to 121°C/175°F to 250°F	x .90
	Above 121°C to 177°C/250°F to 350°F	x .80
	Above 177°C/350°F	x .65

Example for Determining PV Limits:

Seal: 51 mm/2 inches diameter Type 8B1
 Product: Water
 Face Material: Carbon vs. Tungsten Carbide
 Temperature: 16°C/60°F
 Speed: 3600 rpm

Using Chart 3, the maximum pressure would be 83 bar g/1200 psig.

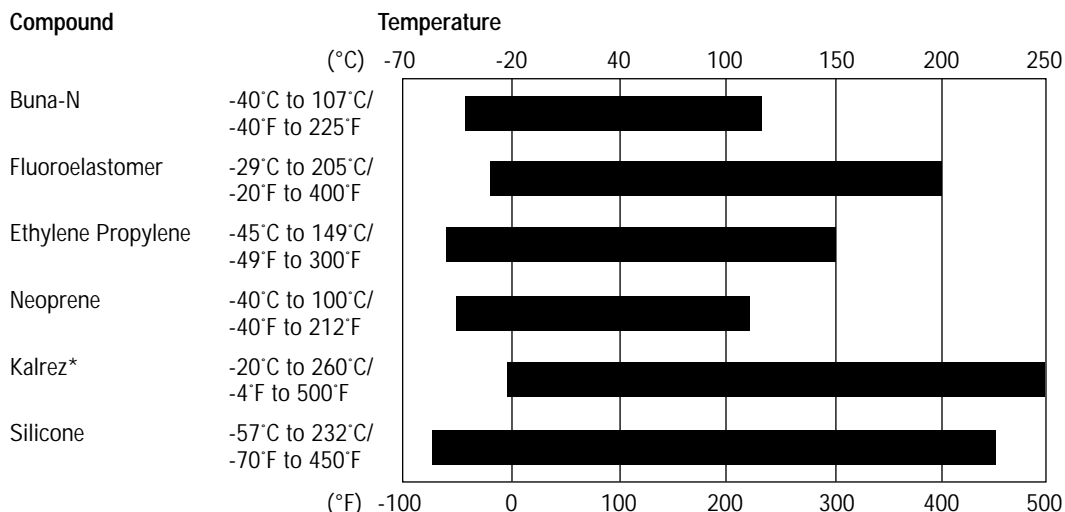
From Chart 4, apply the multipliers for the specific service requirements to determine the maximum operating pressure for the application.

1200 psig x 1 x .67 x 1 = 804 psig/55 bar g

At 3600 rpm with the service conditions noted, a 2 inch diameter Type 8B1 Seal has a maximum operating limit of 804 psig/55 bar g.

* Not to exceed 5000 fpm ** Multiplier = 3600/new speed
 Example: If new speed = 4000 rpm
 Multiplier = 3600/4000 = .90

Chart 5. Elastomer Temperature Limits



* Kalrez is a registered trademark of DuPont.



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Chart 6. Materials of Construction

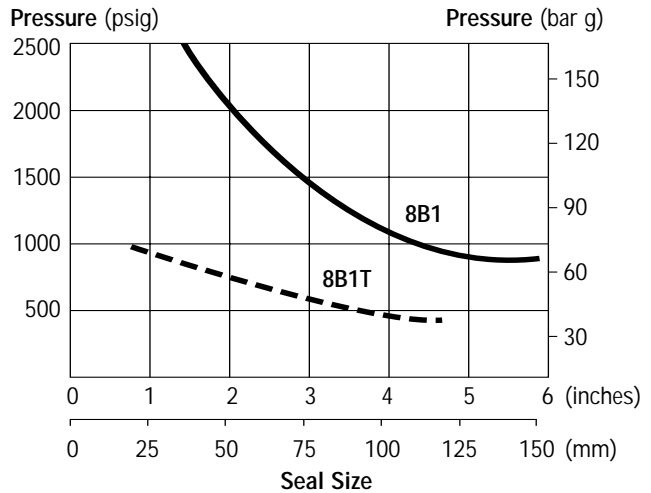
Seal Component Materials		Secondary Sealing Elements O-Rings/Mating Rings	Primary Ring	Hardware Retainer, Disc, Snap Ring, Set Screw	Mating Ring	Mechanical Loading Device Springs
Material	Standard	Buna-N	Carbon	316 Stainless Steel		316 Stainless Steel
		Fluoroelastomer				
		Ethylene Propylene				
		Neoprene				
		Kalrez				
		Silicone				
	Options	Nuclear Service (Radiation Resistant Ethylene Propylene)	Carbon Nuclear Service	Monel		Monel
		Aflas*	Carbon FDA Approved Food Service	20 CB-3 SS Alloy 20		Alloy C-276 (UNS N10276)
		Buna-N FDA Approved	Tungsten Carbide Nickel Binder			
		Fluoroelastomer FDA Approved	Silicon Carbide			
		Ethylene Propylene FDA Approved				
		Neoprene FDA Approved				

* Aflas is a registered trademark of Asahi Glass Co., Ltd.

Chart 7. Criteria for Installation

Shaft/Sleeve	Limits
Surface Finish	16 to 32 Ra
Ovality/Out of Roundness (Shaft)	0.051 mm/0.002"
End Play/Axial Float Allowance	± 0.13 mm/.005"

Chart 8. Hydrostatic Pressure Limits



John Crane Mechanical Seals Engineered Sealing Systems

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1-800-SEALING

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Tel: 52-5-567-4511
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Europe, Middle East, Africa
Slough, UK

Tel: 44-1753-224000
Fax: 44-1753-224224

Asia Pacific
Singapore

Tel: 65-222-9161
Fax: 65-223-5035

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