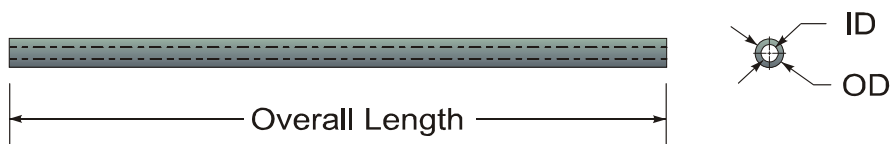


## STARBAR TYPE ESNT PROTECTION TUBES

Starbar type ESNT protection tubes are made of silicon nitride/silicon oxynitride bonded silicon carbide. These tubes are able to survive severe environments, and withstand very high thermal shock.

ESNT tubes are manufactured open both end (OBE) or closed one end (COE) for diameters up to 1.7" (43 mm)



The type, nominal OD x nominal ID x overall length, OBE/COE describes type ESNT tubes. As an example: ESNT 1.7 x 1.15 x 48 COE is a tube 1.7" OD x 1.15" ID x 48" overall length, closed at one end. (ESNT 43 x 29 x 1219 mm, COE)

Typical properties	
Density (g/cc)	2.28
Porosity (%)	31
Permeability	Permeable
Thermal Conductivity ( $W \cdot m^{-1} \cdot K^{-1}$ )	32 @ 20°C
	16.4 @ 1200°C
Coefficient of Thermal Expansion	$4.8 \times 10^{-6} / ^\circ C$
Suggested Max Use Temperature	1427°C (2600°F)

### SIZES AVAILABLE

ESNT protection tubes are available in diameters of 3/4" (19 mm) to 4" (103 mm). The maximum recommended overall lengths are shown below.

Protection Tubes – Type ESNT							
Nominal OD x ID		Outside Diameter		Inside Diameter		Maximum OAL	
mm	in	mm	in	mm	in	mm	in
19 x 12	0.75 x 0.50	19.0 ± 1.0	0.75 ± 0.03	12.0 ± 1.0	0.47 ± 0.03	1524	60
25 x 15	1.00 x 0.63	25.4 ± 1.0	1.00 ± 0.03	15.2 ± 1.0	0.60 ± 0.03	1524	60
30 x 18	1.25 x 0.75	30.5 ± 1.5	1.20 ± 0.04	18.0 ± 1.5	0.71 ± 0.04	1524	60
43 x 29	1.70 x 1.15	43.0 ± 1.5	1.70 ± 0.04	29.2 ± 1.5	1.15 ± 0.04	1829	72
62 x 50	2.45 x 2.00	62.2 ± 1.5	2.45 ± 0.05	49.5 ± 1.5	1.95 ± 0.05	1829	72
88 x 70	3.45 x 2.75	87.6 ± 1.5	3.45 ± 0.05	87.6 ± 1.5	2.75 ± 0.05	1829	72
103 x 81	4.00 x 3.20	103 ± 3.0	4.05 ± 0.10	81.2 ± 3.0	3.20 ± 0.10	1829	72



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