C-SEALS

Designers and manufacturers of high temperature metal seals for the aerospace and associated industries.

Although not shown in this pdf, we are approved suppliers for C-Seals to specification NSA 8620.

Non-standard C-Seals can be manufactured:

- To special diameters
- To special free heights
- Non circular
- From special material

For details of non-standard or help with standard C-Seals please consult us.

Other Seal types available include**:**

Corruseal **Corruplus** **Ellipseal** **Sigma Seal**

Production meets with CAA approval.

This pdf details our standard range of metallic C-Seals.
Throughout these pages imperial dimensions are in inches, metric dimensions are in millimetres and are shown on a pale blue background (see below), except where otherwise stated.

INCHES .006 MILLIMETRES .152

There are various factors which have an effect on the performance of a C-Seal; these should be taken into account when specifying a seal and are discussed below.

The flange should apply load as near as possible to the sealing line of the seal.

The flange surface finish should ideally have circular lay and be N7 (63 microinches, 1.6 micrometres) or smoother. The smoother the finish, the better the sealing. High temperature/high pressure applications and vacuum applications require smoother flange surface finishes. Plating or coating can help by filling the voids and irregularities in the flange sealing surfaces.

Standard material for C Seals is Inconel X750, other materials are available (see seal specification section).

The resilience or ‘springback’ of a C-Seal allows the seal to accommodate flange separation during operation. Generally, the larger the free height, the greater the seal resilience.

The seating load is dependent on the free height, material type and thickness, heat treatment and cavity depth.

Seating loads are given in table A. Figures are for short cycle precipitation heat treated Inconel X750 seals. These figures are for guidance only; tolerances and variations in material thickness, properties, coatings and platings along with seal diameter will have a significant effect on these values.

TABLE A

NOMINAL SEAL FREE HEIGHT		**MATERIAL THICKNESS**		**SEATING LOAD**	
				ilf/in of circumference	N/25 mm of circumference
1/16	1.58	.010	.254	240	1068
3/32	2.36	.015	.381	400	1779
1/8	3.18	.015	.381	240	1068
3/16	4.75	.020	.508	300	1334
1/4	6.35	.025	.635	400	1779

C-SEAL TYPES

CI SERIES – INTERNAL PRESSURE

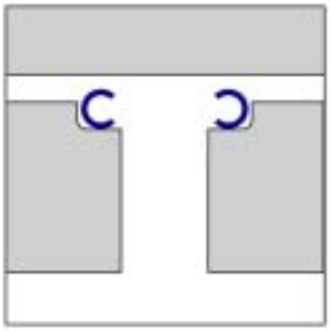
CE SERIES – EXTERNAL PRESSURE

CA SERIES – AXIAL PRESSURE

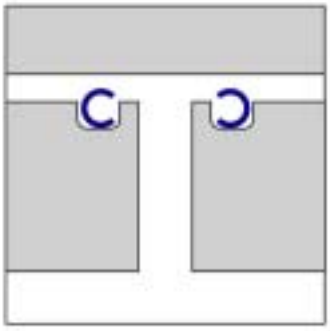
BOSS SEALS

Face type C-Seals can be used in:

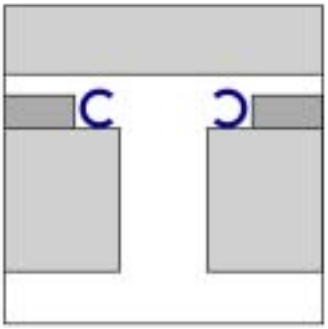
1. Counterbore



2. Groove



3. Retaining Plate



SEAL SPECIFICATIONS

The part number system enables the selection of the correct seal for each application and installation using the permutations of size, material, plating etc.

PART NUMBER

1	2	3	4	5	6
CE 0020	06	12	2	SP	A

1 Seal type and diameter
2 Free height & material thickness
3 Material type
4 Heat treatment
5 Plating or coating
6 Plating or coating thickness

SEAL TYPE AND DIAMETER

CE 0020	06	12	2	SP	A

The first six characters of the part number give the seal type along with the seal and cavity diameters for each available free height.

Three types of C-Seal are available:

I. Internal pressure face seal, see pages 6-22 for details of sizes.
II. External pressure face seal, see pages 23-38 for details of sizes.
III. Axial pressure seal - sealing on the OD and ID, see pages 39-44 for details of sizes.

FREE HEIGHT AND MATERIAL THICKNESS

CE 0020	06	12	2	SP	A

The seventh and eighth digits give the seal free height and material thickness.

Table 1 lists seal free heights and cavity depths.
Table 2 lists seal free heights and material thickness.

Decide on required seal free height using Table 1. Then using chosen value, go to Table 2 and decide on material thickness from the options available. You can now establish Part No. Code from column 1.

TABLE 1

NOMINAL SEAL FREE HEIGHT		ACTUAL SEAL FREE HEIGHT		CAVITY DEPTH		CAVITY CORNER RADIUS R (MAX)	
1/16	1.58	.063 .061	1.600 1.549	.051 .049	1.295 1.245	.020	.508
3/32	2.36	.094 .092	2.388 2.337	.077 .073	1.956 1.854	.030	.762
1/8	3.18	.126 .124	3.200 3.150	.104 .099	2.642 2.515	.045	1.143
3/16	4.75	.189 .185	4.801 4.699	.155 .149	3.937 3.785	.070	1.778
1/4	6.35	.253 .247	6.426 6.274	.205 .199	5.207 5.055	.090	2.286

TABLE 2

PART NO. CODE	NOMINAL SEAL FREE HEIGHT		MATERIAL THICKNESS		
01 02*	1/16	1.58	.006 .010	.152 .254	Thin Wall Standard
03 04*	3/32	2.36	.010 .015	.254 .381	Thin Wall Standard
05 06 07	1/8	3.18	.010 .015 .020	.254 .381 .508	Thin Wall Standard Thick Wall
08 09	3/16	4.75	.015 .020	.381 .508	Thin Wall Standard
10 11	1/4	6.35	.020 .025	.508 .635	Thin Wall Standard

For Seals CI 0007, CA 0007, CE 0007, and smaller, standard material thickness is:
.006 .152 for 1/16 1.58 free height
.010 .254 for 3/32 2.36 free height

MATERIAL TYPE

CE 0020	06	12	2	SP	A

The ninth and tenth digits give the material type used to manufacture the seal.

Table 3 lists material types.

TABLE 3

PART NO. CODE	MATERIAL	COMMENTS
11	Nimonic 80A	
12	Inconel X750	Standard Material for C-Seals
13	Stainless Steel	
14	Inconel 718	

HEAT TREATMENT

CE 0020	06	12	2	SP	A

The eleventh digit gives the heat treatment applied to the seal.

Table 4 lists heat treatments.

Not all heat treatments are applicable to all materials. If in doubt please consult us.

TABLE 4

PART NO. CODE	HEAT TREATMENT	COMMENTS
1	Work Hardened	Standard for Axial Pressure C-Seals
2	Short Cycle Precipitation Heat Treatment	Suitable for most Face C-Seals
3	Long Cycle Precipitation Heat Treatment	Consider these Treatments for very High Temperature and/or very Arduous Applications
4	Solution and Long Cycle Precipitation Heat Treatment	
5	Customer Specification	

PLATING OR COATING

CE 0020	06	12	2	SP	A

The twelfth and thirteenth digits give the plating or coating applied to the seal.

Table 5 lists platings and coatings.

TABLE 5

PART NO. CODE	PLATING OR COATING	COMMENTS
OP	None	
SP	Silver	Suitable for most applications
NP	Nickel	
CP	Copper	
GP	Gold	Very Expensive
LP	Lead	Soft, Max Temp 150°C/300°F
PP	PTFE	Max Temp 220°C/430°F
IP	Indium	Very Soft, Low Temp Only

Plating may be incomplete inside C section.

PLATING OR COATING THICKNESS

CE 0020	06	12	2	SP	A

The fourteenth digit gives the plating or coating thickness.

Table 6 lists thickness of plating or coating.

TABLE 6

PART NO. CODE	PLATING OR COATING THICKNESS		COMMENTS
A	.0010 .0005	.0254 .0127	Standard for Silver
B	.0015 .0010	.0381 .0254	
C	.0025 .0015	.0635 .0381	
D	.0030 .0020	.0762 .0508	
E	Customer Specification		
O	None		Use with Unplated Seals

All sizes in this brochure are prior to plating or coating. For plated or coated seals the OD and free height of the seal will increase by twice the plating or coating thickness. The ID will decrease by twice the plating or coating thickness. Do not change the cavity depth.