

Hub Outer Diameter Calculation

Doc No: N-DD-HODC-230721

Issue Date: 28-07-21

Rev No: 01

Rev Date: 31-07-21

Page | 1

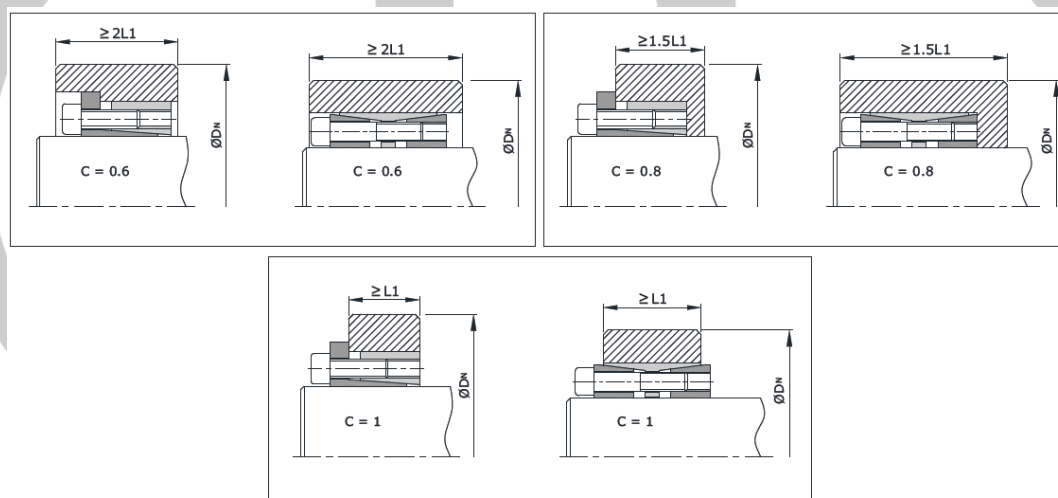
❖ Product Name: Locking Assembly

The external diameter of hub D_N required depends on the hub geometry, yield strength of the hub material and surface pressure between clamping element and hub.

❖ Input Values

- D_N = Minimum hub OD Require, mm
- D = Inside diameter of hub bore, mm
- P = hub Pressure, N/mm^2 (at Mb Max.)
- $\sigma_{0.2B}$ = Hub material yield point, N/mm^2
- C = Hub geometry factor
- L = Locking assembly Outer Race Length, mm
- $C = 0.6$, Hub Length $\geq 2L$, For Hubs which are twice as wide as the locking unit
- $C = 0.8$, Hub Length $\geq 1.5L$, For Hubs which are 1.5 times as wide as the locking unit
- $C = 1$, Hub Length $\geq L$, For Hubs which are as wide as the locking unit

❖ Calculation Procedure:



According to Thick walled cylinder theory,

Determining Hub Diameter,

$$D_N \geq D \times K \quad \text{Where, } K = \sqrt{\frac{\sigma_{0.2B} + (CxP)}{\sigma_{0.2B} - (CxP)}}$$

❖ Technical Information for Shaft & Hub:

- N7515 - Maximum allowable Surface finish for shaft $R_a \leq 1.6 \mu m$ & for Hub $R_a \leq 3.2 \mu m$.
For other models - a good Surface finish by Machine tool is sufficient. Maximum allowable Surface finish $R \leq 3.2 \mu m$
- N7515 / N7015.0 - Maximum Permissible Tolerance for Shaft is h8 & for Hub bore is H8.