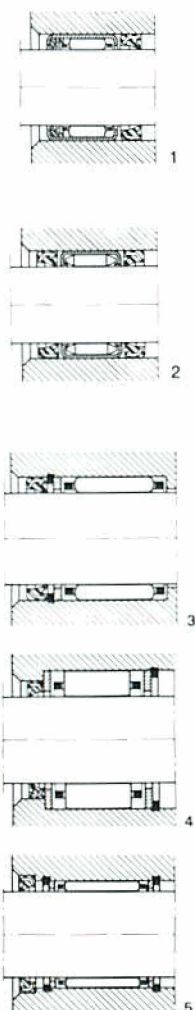


## SEALING RINGS



NADELLA sealing rings type ET, made in synthetic rubber and incorporating a metal insert, have the same inner and outer dimensions as NADELLA needle bushes and the radial portion of the combined bearings type RAX 700. The recommended housing and shaft tolerances for these bearings ensure a tight fit of the sealing ring in the housing bore and the optimum friction between lip and shaft. The simple installation of this low-cost seal, requiring no special machining, provides a very economical seal within a minimum space. A caged needle bush, type DB...E (or HK...E) incorporating a sealing ring at one end, may also be used with a type ET sealing ring installed adjoining the other end of the bearing, thus creating a completely sealed bearing (Fig. 1).

In the case of grease lubrication, the seal should be installed with the lip facing away from the bearing (Fig. 1) to enable expulsion of old grease when replenishing by means of a pump. For oil lubrication, installation the opposite way is recommended (Fig. 2). If the prevailing conditions are particularly dirty, it may be necessary to protect the seal additionally by means of a labyrinth.

ET sealing rings may also be used with NADELLA needle cages having the same shaft and housing diameters (Fig. 3) or with those having larger or smaller housing diameters than that of the seal (Fig. 4 and Fig. 5).

The hardness and surface finish required for the raceway on the shaft enable these sealing rings to operate at circumferential speeds of 10–12 m/s, providing lubrication is adequate (for higher speeds – please consult NADELLA Technical Department).

Standard type ET sealing rings will operate satisfactorily at temperatures from  $-20^{\circ}\text{C}$  to  $+120^{\circ}\text{C}$ . For conditions outside this temperature range, please consult NADELLA.

### INSTALLATION

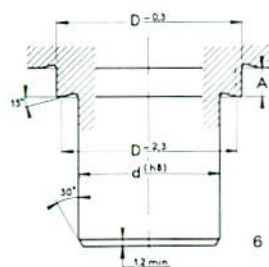
Type ET sealing rings should be smeared with grease before mounting – on the outside diameter (to facilitate assembly and avoid damage) and on the inside (to prevent dry operation when starting from rest).

The edge of the housing bore should be chamfered to prevent damage to the seal and to facilitate assembly. A small press should be used for this purpose – such as that used to install needle bushes, in order to guide the sealing ring parallel to the axis of the housing bore.

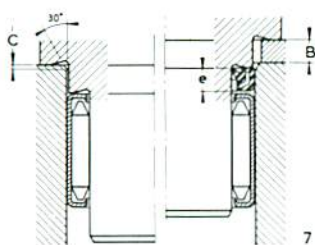
The needle bush and the sealing ring must be installed separately in two distinct operations. The same mandrel (Fig. 6) may be used for both operations: the seal installation being effected by limiting the mandrel stroke with a spacer (Fig. 7).

In order to prevent the risk of damage to the seal lip, the shaft end must be chamfered.

# SEALING RINGS



$$A = e + 1,2 - 1,4$$



$$B = e + 0,3 - 0,5$$

$$C = 0,5 - 0,7$$

| Shaft Dia.<br>mm | Designation | d<br>mm | D<br>mm | e<br>mm | Speed limit<br>r.p.m. | Weight approx.<br>g |
|------------------|-------------|---------|---------|---------|-----------------------|---------------------|
| 5                | ET 5 9      | 5       | 9       | 2       | 45 000                | 0,37                |
| 6                | ET 6 10     | 6       | 10      | 2       | 37 500                | 0,43                |
|                  | ET 6 12     |         | 12      | 3       | 37 500                | 0,67                |
| 7                | ET 7 11     | 7       | 11      | 2       | 32 000                | 0,45                |
| 8                | ET 8 12     | 8       | 12      | 3       | 28 000                | 0,70                |
|                  | ET 8 14     |         | 14      | 3       | 28 000                | 0,80                |
| 9                | ET 9 13     | 9       | 13      | 3       | 25 000                | 0,85                |
|                  | ET 9 14     |         | 14      | 3       | 25 000                | 1,15                |
| 10               | ET 10 14    | 10      | 14      | 3       | 22 500                | 0,90                |
|                  | ET 10 16    |         | 16      | 3       | 22 500                | 0,95                |
| 12               | ET 12 16    | 12      | 16      | 3       | 19 000                | 1,06                |
|                  | ET 12 18    |         | 18      | 3       | 19 000                | 1,12                |
| 13               | ET 13 19    | 13      | 19      | 3       | 17 500                | 1,20                |
| 14               | ET 14 20    | 14      | 20      | 3       | 16 000                | 1,25                |
| 15               | ET 15 21    | 15      | 21      | 4       | 15 000                | 1,70                |
| 16               | ET 16 22    | 16      | 22      | 3       | 14 000                | 1,40                |
| 17               | ET 17 23    | 17      | 23      | 3       | 13 200                | 1,50                |
| 18               | ET 18 24    | 18      | 24      | 4       | 12 500                | 1,80                |
| 20               | ET 20 26    | 20      | 26      | 4       | 11 200                | 2,10                |
|                  | ET 20 28    |         | 28      | 4       | 11 200                | 2,90                |
| 22               | ET 22 28    | 22      | 28      | 4       | 10 200                | 2,20                |
| 24               | ET 24 32    | 24      | 32      | 4       | 9 400                 | 3,25                |
| 25               | ET 25 32    | 25      | 32      | 4       | 9 000                 | 2,95                |
|                  | ET 25 33    |         | 33      | 4       | 9 000                 | 3,30                |
| 28               | ET 28 35    | 28      | 35      | 4       | 8 000                 | 3,30                |
|                  | ET 28 36    |         | 36      | 4       | 8 000                 | 3,80                |
| 30               | ET 30 37    | 30      | 37      | 4       | 7 500                 | 3,40                |
|                  | ET 30 38    |         | 38      | 4       | 7 500                 | 3,90                |
| 35               | ET 35 42    | 35      | 42      | 4       | 6 500                 | 4,90                |
|                  | ET 34 43    |         | 43      | 4       | 6 500                 | 5,40                |
| 40               | ET 40 47    | 40      | 47      | 4       | 5 600                 | 5,30                |
|                  | ET 40 48    |         | 48      | 4       | 5 600                 | 6,05                |
| 44               | ET 44 52    | 44      | 52      | 4       | 5 100                 | 6,55                |
| 45               | ET 45 52    | 45      | 52      | 4       | 5 000                 | 5,80                |
| 50               | ET 50 58    | 50      | 58      | 4       | 4 500                 | 7,50                |
| 55               | ET 55 63    | 55      | 63      | 4       | 4 000                 | 8,40                |