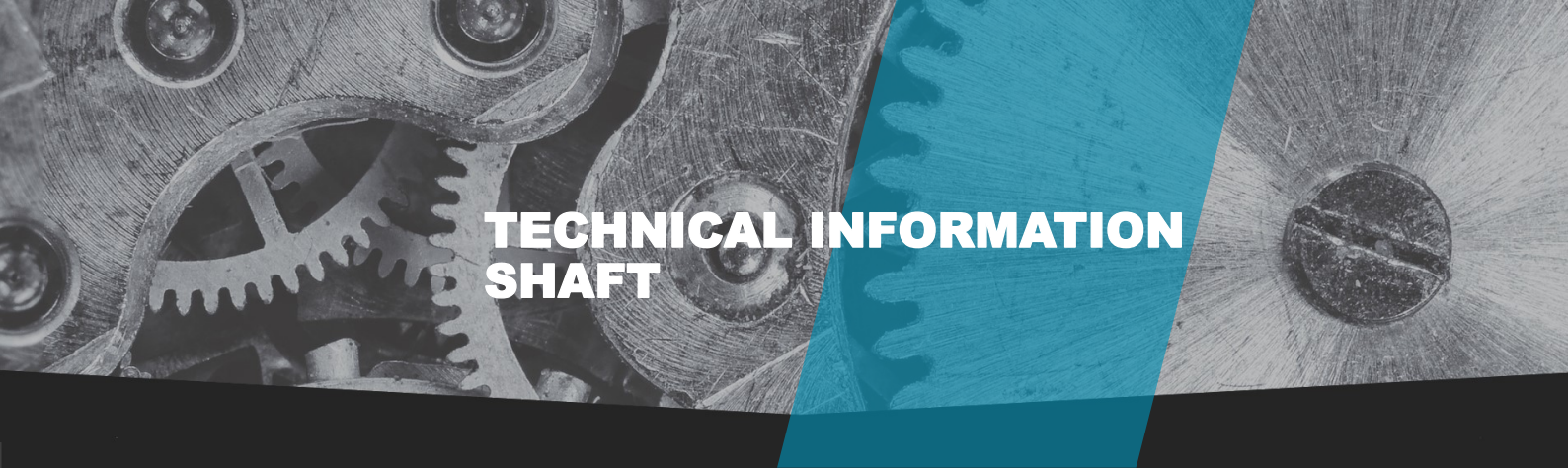


# TECHNICAL INFORMATION
# SHAFT

## Shafts

For optimum seal performance we must consider the shaft material, hardness, roughness, eccentricity and tolerance according to the following points.

### Shaft Material

Seals perform best on a medium carbon steel or stainless steel shaft. Heat treatment or nitriding is especially recommended. To seal water at low surface velocity, stainless steel is more suitable

### Shaft Hardness

In the area where the sealing lip contacts the shaft we recommend that the minimum hardness is 45 HRc. Where lubrication is doubtful, abrasive matter is present or the shaft speed is greater than 14 m/sec 55 HRc is preferred.

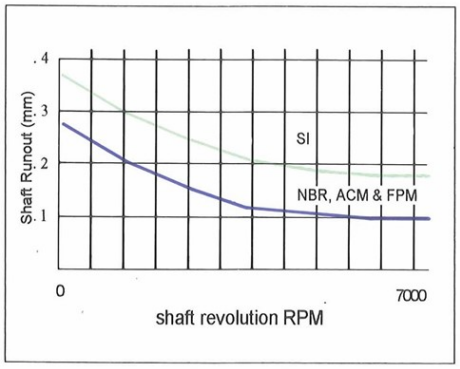
### Shaft Roughness

We recommend the shaft be machined, preferably plunge ground, to a surface roughness of Rt = 1 to 4 mm (Ra = 0.2 to 0.8 mm), in the area of the contact surface, any machine lead are not permitted.

### Shaft eccentricity

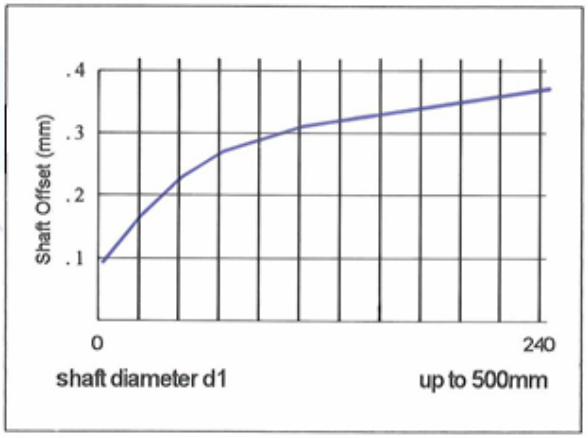
Two types of shaft eccentricity affect seal performance. They are dynamic runout (double dynamic eccentricity) and offset (shaft to bore misalignment or static eccentricity). The allowable eccentricity is referred to in the following graphs

### Shaft Runout



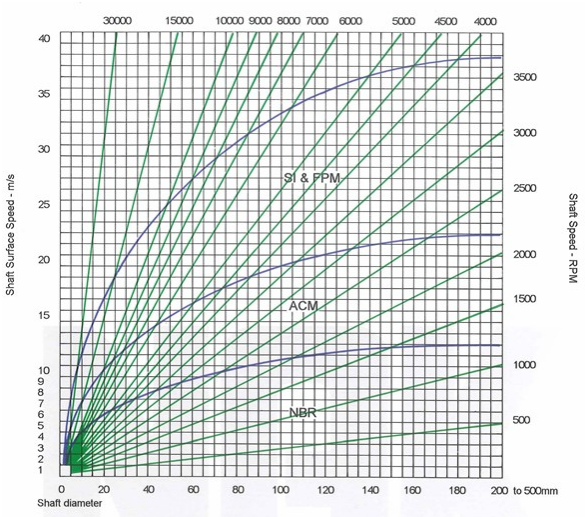
# TECHNICAL INFORMATION
# SHAFT

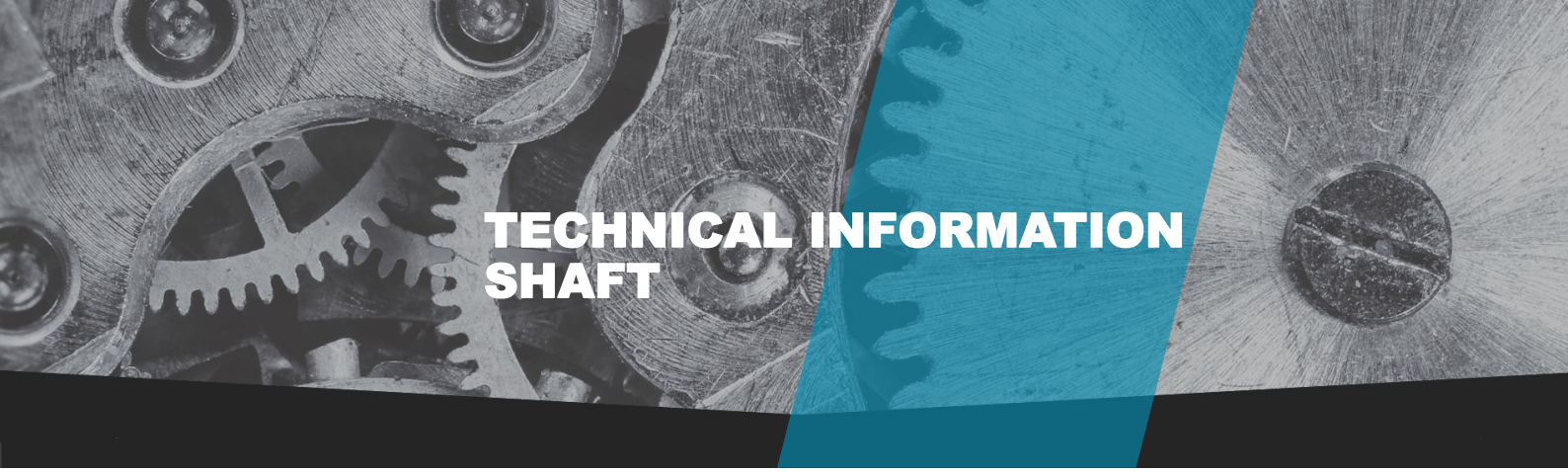
## Shaft Offset




## Shaft Speed

For non-pressurised conditions the shaft speed corresponding to lip material is referred to below.





# TECHNICAL INFORMATION
# SHAFT

## Shaft Tolerance

The recommended tolerances are in tables below.

| Shaft Diameter $d_2$ (inch) | Tolerance |
|---|---|
| Up to 4.000 | +/- 0.003 |
| 4.001 to 6.000 | +/- 0.004 |
| 6.001 to 10.000 | +/- 0.005 |
| 10.001+ | +/- 0.006 |

| Shaft diameter $d_1$ (mm) | Tolerance in mm (ISO/h11) | |
|---|---|---|
| | Lower | upper |
| Over 0 to 3 | 0 | -60 |
| Over 3 to 6 | 0 | -75 |
| Over 6 to 10 | 0 | -90 |
| Over 10 to 18 | 0 | -110 |
| Over 18 to 30 | 0 | -130 |
| Over 30 to 50 | 0 | -160 |
| Over 50 to 80- | 0 | -190 |
| Over 80 to 120 | 0 | -220 |
| Over 120 to 180 | 0 | -250 |
| Over 180 to 250 | 0 | -290 |
| Over 250 to 315 | 0 | -320 |
| Over 315 to 400 | 0 | -360 |
| Over 400 to 500 | 0 | -400 |