



ISO-9001/14001  
ISO/TS-16949  
OHSAS-18001

# Product Information

## N Type Pressure Seal

**NAK N TYPE SEALS** are pressure resistant shaft seals that offer excellent sealing function at medium to high pressures applications. They are designed for the sealing of pressurized media without the need of additional back-up rings. Applications include: hydraulic pumps, hydraulic motors, hydrodynamic clutches, etc. With proper material selection, they carry out excellent performance under different mineral and synthetic oils and have excellent temperature capability.



# N TYPE SEAL

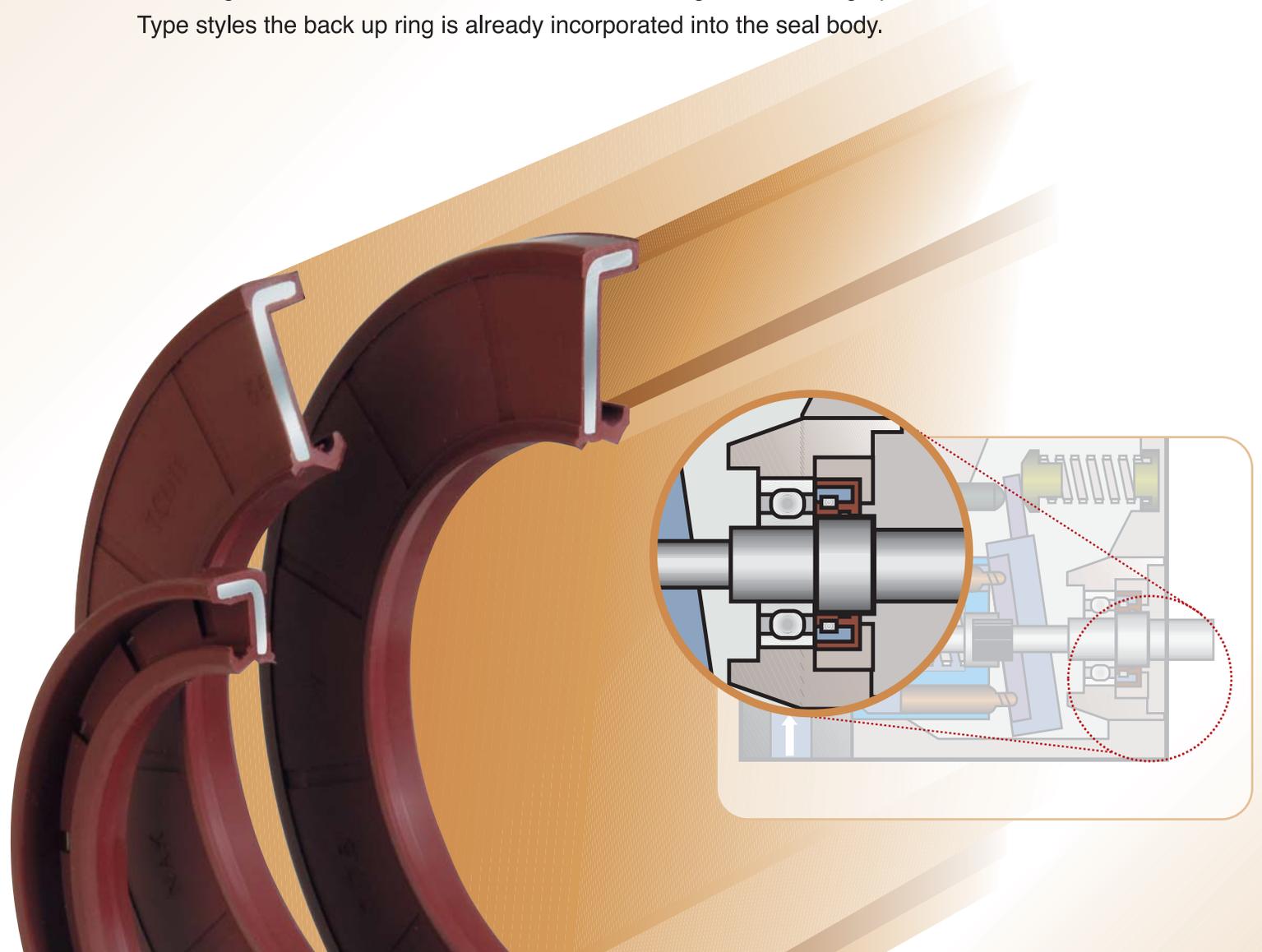


# Product Description

## NAK N Type Seals for Sealing at Medium to High Pressures without Additional Back-up Rings

**NAK N Type Pressure Seals** are specifically designed for use in pressurized operating conditions. Typical oil seals such as TC type seals normally function under pressures below 0.3 bars. When the operating pressures go beyond 0.3 bar, the sealing lip will be compressed dramatically that result in large contact width with the rotary shaft. That will increase friction and heat generation, and the sealing function and service life might be reduced. In some high-pressure applications, back-up ring is required to reinforce the supporting of sealing lip. However, this may present inconveniences for installation and replacement and increase cost.

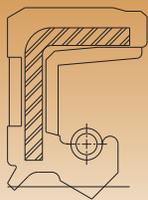
With improved seal design, N Type Seals offer excellent sealing function and long service life in high-pressure applications. N Type Seals are made with a spring-loaded primary sealing lip, reinforced metal shell, and a shorter flex section design. Combined with the use of high performance materials, the design ensures that the seal has sufficient strength to resist high pressure. In addition, some N Type styles the back up ring is already incorporated into the seal body.



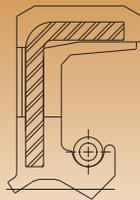
# Technical Information

## Standard Range Plus Variations and Custom Designs

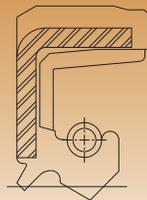
The N Type Pressure Seals Family comprises standard range as well as variations to suit a wide range of high-pressure operating conditions. TCN1/TCN11 for medium pressure application, and TCN2 for high pressure application. -PL type with low friction PTFE bonded on the sealing element design can reduce shaft abrasion. Innovation design of TCN4 incorporated with a back-up ring into the seal body to reinforce the supporting of sealing lip. Other types of N pressure seal, TDN, TDN1, TAN-Series etc. are also available, please contact with NAK for more information.



TCN1



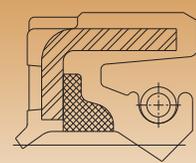
TCN11



TCN2



TCN2-PL

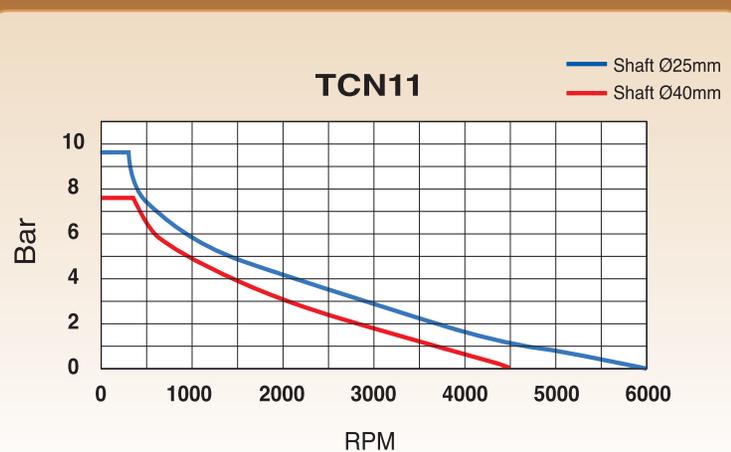


TCN4

### Pressure Ranges

TCN1	≤	5 Bar
TCN11	≤	5 Bar
TCN2	≤	10 Bar
TCN4	≤	10 Bar

### P-V Curve of TCN11



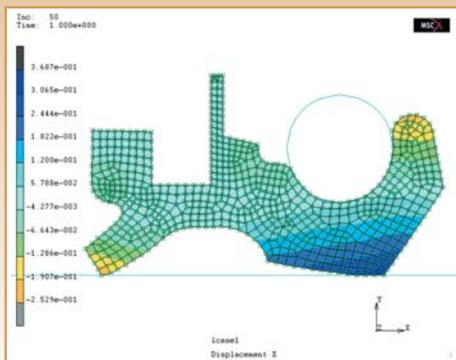
*The above technical data and information is for reference only. The selection of the proper pressure resistant seal is dependent upon the requirement of each individual application. Please contact us for more information.*

# CAE Program and Dynamic Testing Laboratory

In the design of pressure seals, NAK utilizes specialized CAE (Computer-Aided Engineering) programs, such as Finite Element Analysis (FEA) and Seal CAD (SCAD) System to ensure high performance design.

FEA have the ability to analyze sealing lip deformation and stress distribution. By this way, traditional try-and-error developing process can be reduced.

In order to ensure the good quality and collaborate developing with OEM customers, NAK set-up a seal dynamic testing laboratory for different kinds of tests. As to pressure seal, NAK are able to test for medium and high-pressure applications. The maximum pressure testing ability can up to 120 bar.



## Disclaimer

1. NAK product is prohibited to use, install or apply in or on any aerospace related instrument and equipment.
2. NAK has no liability under any express or implied Warranty if NAK Product:
  - is modified or tampered;
  - is misused, abused or misapplied;
  - is used in a critical environment or specific equipment without NAK prior written acknowledgement;
  - is not used in accordance with the printed user instruction materials
  - is damaged owing to natural deterioration, decomposition or transformation of chemical structure
3. If NAK's product to be applied in critical environment or specific equipment, it is only allowed to launch into mass production when the sample has been passed the testing conducted by the user.



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