

# Mechanical expansion shaft

## Series 416

with individual expansion lugs

The Vorwald expansion shafts of the Series 416 are the standard models with individual expansion lugs that may be used in all applications. The simple construction ensures long service life.

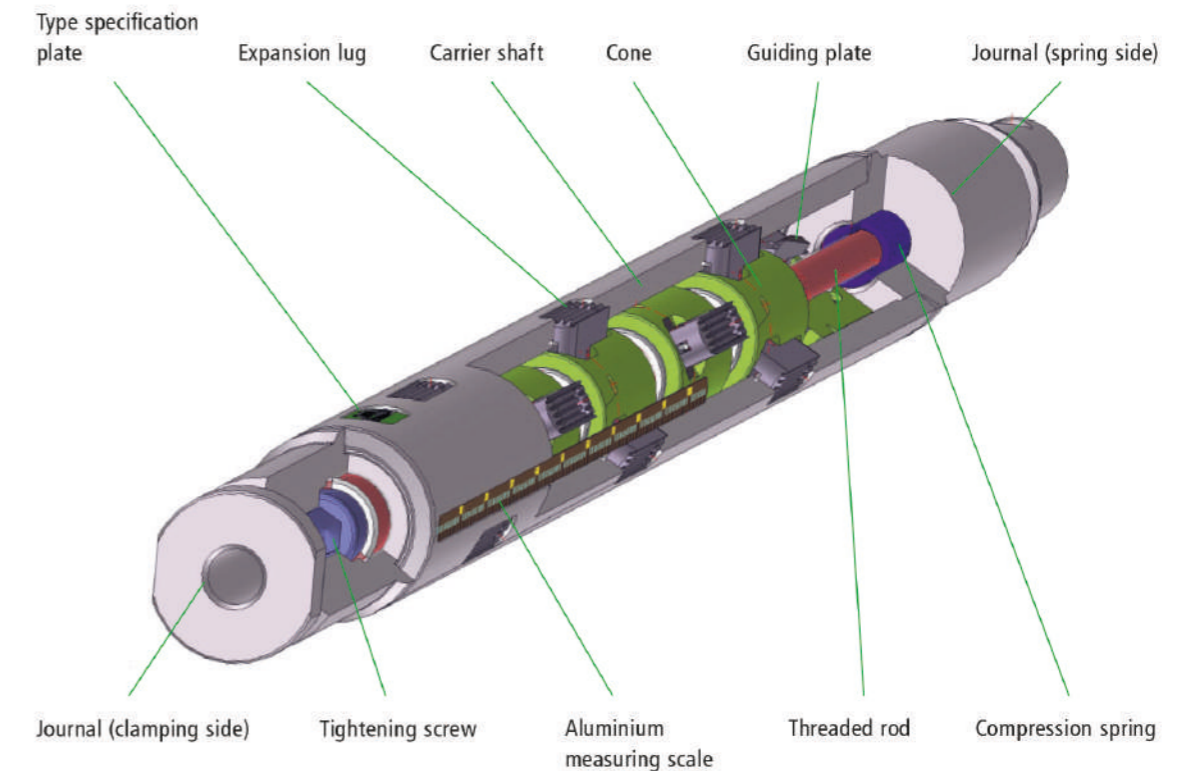
Two expansion lug types are available in order to cover all requirements: Lengthwise grooved expansion lugs made of steel and expansion lugs with smooth surface made of polyurethane. The number and positioning of the expansion lugs in the shaft body are determined by the customer specifications. The lengthwise grooved and hardened surface of the steel lugs permits greatest possible torque transmission with cardboard cores. The smooth surface of the polyurethane lugs permits this force transmission with steel and plastic cores.

All expansion lugs are equipped with a leg spring to ensure slide-back into the shaft body. This makes simple push-on and push-off of the material cores possible.

Expansion shafts with expansion lugs are available for cores with internal diameters in the range from 50 to 500 mm.

The functional principle is based on the inclined plane. By actuating the tightening screw the cone is pushed via a threaded rod under the expansion lugs like a wedge. The cone and the expansion lug have the same bevel, so that a radial movement is produced from an axial movement. By this means the expansion shaft acquires a very large clamping force. A further very important advantage of this method is the absolutely concentric clamping of the cores, since all expansion lugs expand to the same extent. This makes very high winding speeds possible. The shaft bodies can be made of numerous materials with numerous wall thicknesses – depending on the application by the customer.

Based on the Vorwald standard, the expansion shafts are customised according to the modular design principle. The clamping mechanism can be actuated in various ways by various means: e.g. with an internal clamping screw, an external clamping nut or a radial clamping screw.



### Options

- Expansion screw mounted axially in the journal
- Radial expansion nut / expansion screw
- Also available as cantilevered version with bearing on only one side
- Special dimensions are possible on inquiry

### Advantages

- + Very high weight bearing capability for heavy reels
- + Absolutely concentric clamping, thus very high web speeds possible
- + High torque transmission
- + Simple handling
- + Very little maintenance required

Available shaft diameters  
from 50 to 500 mm



# Mechanical expansion shaft

## Series 401

with individual expansion lugs

The Vorwald expansion shafts of the Series 401 are the standard range of models with individual expansion lugs that may be used in nearly all winding processes. The simple construction ensures long service life.

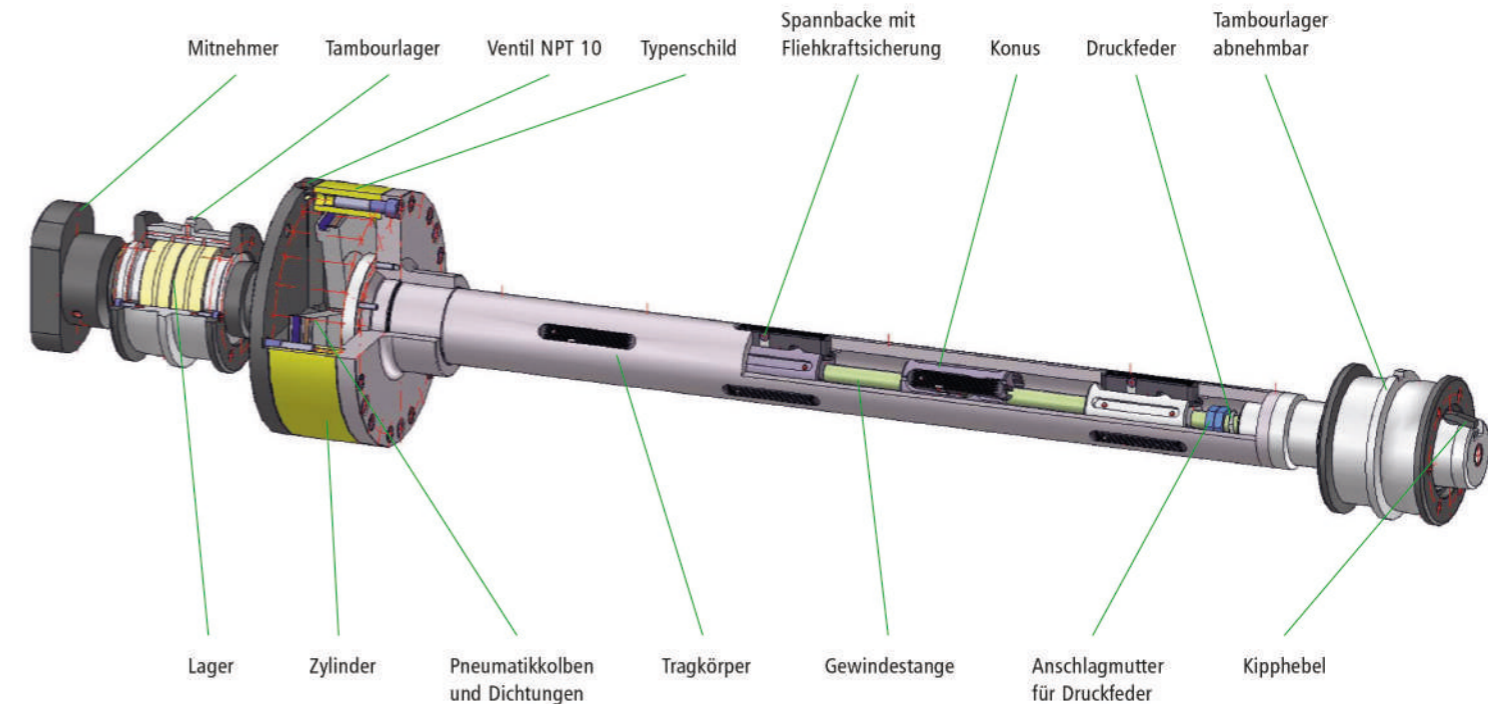
Two types of expansion lugs are available to cover all requirements: Lengthwise grooved expansion lugs made of steel and expansion lugs with smooth surface made of polyurethane. The number and positioning of the expansion lugs in the shaft body are determined by the customer requirements.

The lengthwise grooved and hardened surface of the steel lugs permits greatest possible torque transmission with paper cores. The smooth surface of the polyurethane lugs makes this force transmission possible with steel and plastic cores. All expansion lugs are equipped with a leg spring ensuring slide-back into the shaft body. This makes simple push-on and push-off of the material cores possible. Expansion shafts with expansion lugs are available for cores with an inside diameter in the range from 50 to 500 mm.

The functional principle is based on the inclined plane. By feeding compressed air into the pneumatic chamber the cone is pushed via a threaded rod under the clamping lug like a wedge. The cone and the expansion lug have the same bevel. This produces a radial movement from an axial movement. By this means the expansion shaft acquires a very large clamping force.

A very important further advantage of this method is the absolutely concentric clamping of the cores, since all expansion lugs expand to the same extent. This makes very high winding speeds achievable. The shaft bodies are made of numerous materials with numerous wall thicknesses – depending on the application by the customer.

Based on the Vorwald standard, the expansion shafts are customised according to the modular design principle. The clamping mechanism is actuated via a pneumatic piston that can optionally be equipped with a hydraulic booster for further increasing the clamping force.



### Options

- inflation axially, radially or as combination
- With and without hydraulic booster
- Also available as cantilevered version
- Special dimensions are possible on inquiry

### Advantages

- + Very high weight bearing capability for heavy reels
- + Absolutely concentric clamping, thus very high web speeds possible
- + Very large torque transmission
- + Journal version on customer request
- + Simple handling
- + Very little maintenance required

Available shaft diameters  
in the range from 50 to 500 mm



# Mechanical expansion shaft

## Series 745

with continuous expansion leaves

The Vorwald expansion shafts of the Series 745 are mechanical expansion shafts with continuous expansion leaves that are suitable for very narrow or thin-walled cores. The simple construction ensures a long service life. The surface of the outer leaf is available in lengthwise grooved or in polyurethane coated versions. The lengthwise grooved surface of the aluminium or steel leaves permits greatest possible torque transmission with paper cores. The smooth surface of the polyurethane leaves makes this force transmission possible with steel and plastic cores. All expansion leaves are bolted to expansion lugs underneath them. These expansion lugs in turn are equipped with a leg spring ensuring reliable contraction of the leaves. This makes simple push-on and push-off of the material cores possible. Further assistance is provided by the push-on and push-off ledges bolted onto the carrier tube.

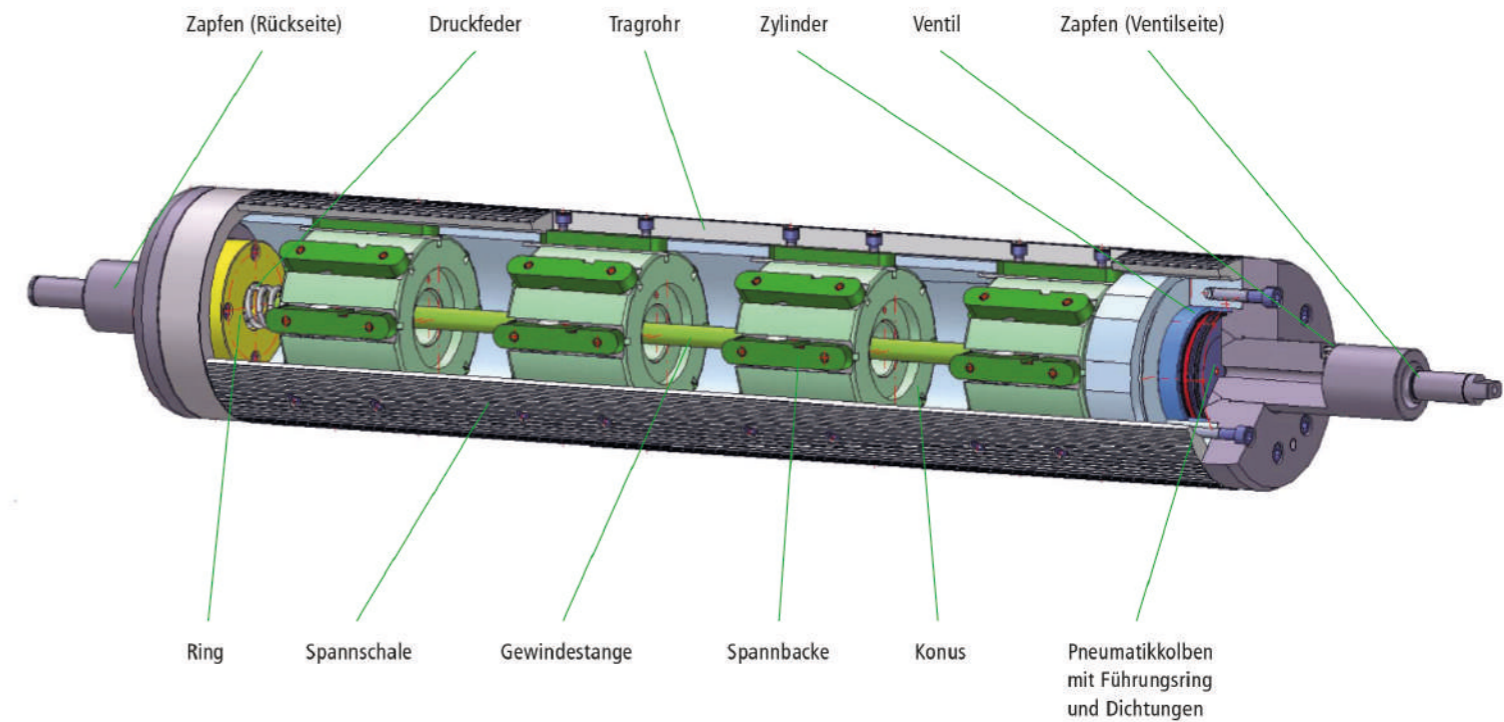
Expansion shafts with expansion leaves are available for cores with an internal diameter in the range from 68 to 600 mm.

The functional principle is based on the inclined plane. By feeding compressed air into the pneumatic chamber the cone is pushed via a threaded rod under the expansion lug like a wedge. The cone and the expansion lug have the same bevel. This produces a radial movement from an axial movement.

By this means the expansion shaft acquires a very large clamping force. A further very important advantage of this method is the absolutely concentric clamping of the cores, since all expansion leaves expand to the same extent. This makes very high winding speeds achievable.

The shaft bodies are made of numerous materials with numerous wall thicknesses – depending on the application by the customer. Based on the Vorwald standard, the expansion shafts are customised according to the modular design principle.

The clamping mechanism is actuated by a pneumatic piston that can be optionally equipped with a hydraulic booster for further increase of the clamping force.



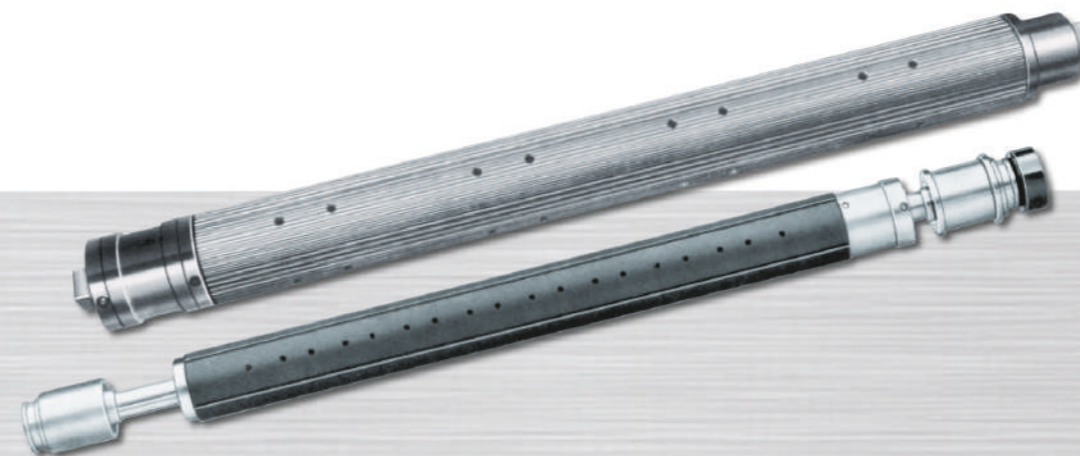
### Options

- Compressed air inflation axially, radially or as combination
- Expansion leaf available made of steel, aluminium and with PU-coated surface
- With and without hydraulic booster
- Also available as cantilevered version
- Special dimensions are possible on inquiry

### Advantages

- + Very high weight bearing capability for heavy reels
- + Absolutely concentric clamping, thus very high web speeds possible
- + Very high torque transmission
- + Journal design according to customer specification
- + Simple handling
- + Very little maintenance required

Available shaft diameters  
in the range from 68 to 600 mm



# Mechanical expansion shaft Series 410 Multicore®

with continuous expansion and centering ledges

The multicore expansion shaft is suitable for safe take-up of many narrow individual cores without being confined to fixed subdivision patterns. At the same time it achieves maximum possible moments of inertia, thus minimised bending values.

The centering ledges expand purely mechanically to centre and round the cores optimally on the expansion shaft. Even with increased loads the ledges remain "fixed" in position by virtue of the self-blocking mechanics, thus ensuring steady running and good reel build-up.

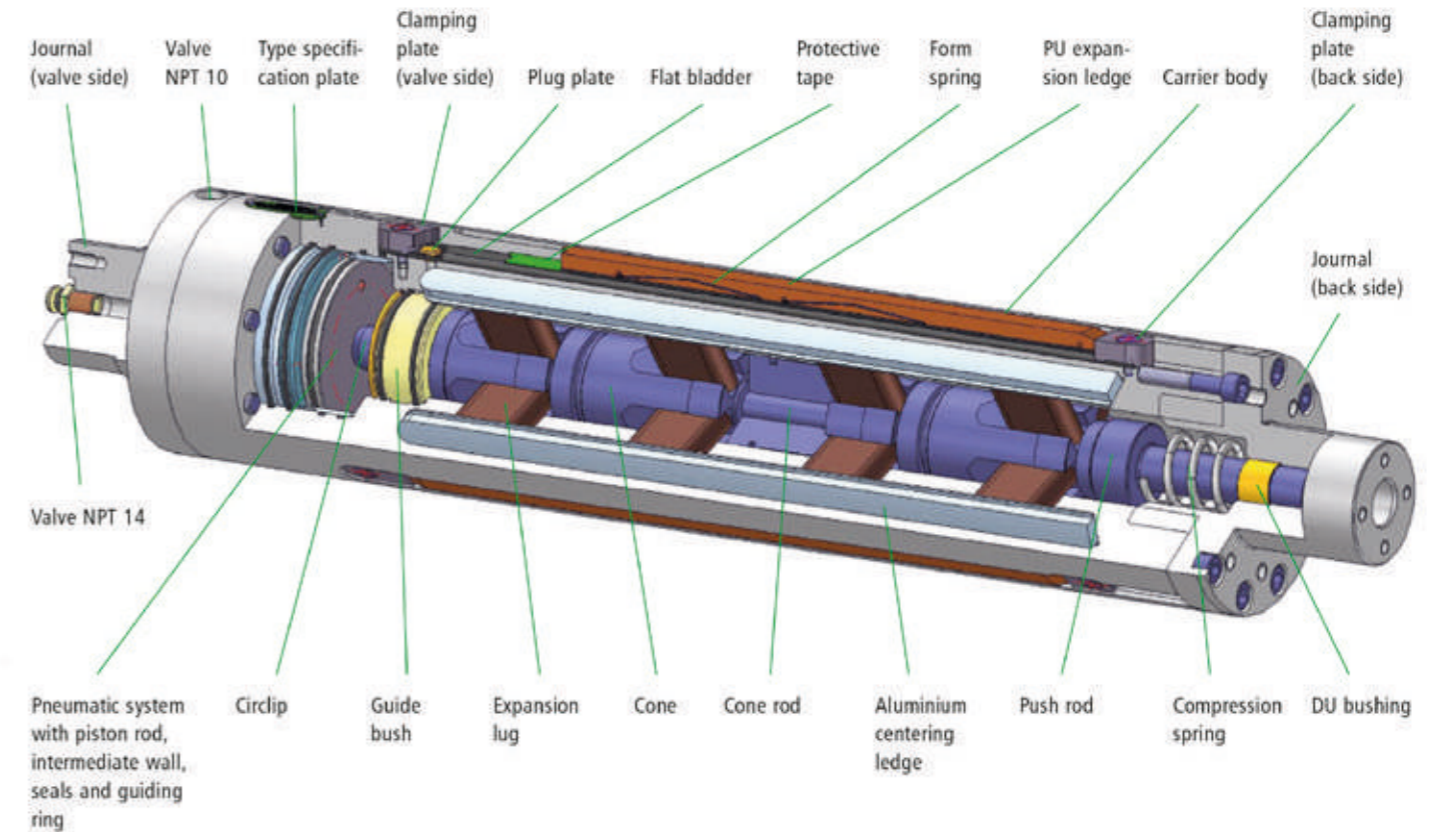
The expansion ledges expand purely pneumatically and thus ensure dependable torque transmission to every core. Expansion shafts with expansion ledges are available for cores with an internal diameter in the range from 150 to 600 mm.

By feeding compressed air into the pneumatic chamber the pneumatic piston is moved axially in the cylinder and displaces the internal cone driving rod.

The uniform centering ledge expansion resulting therefrom ensures concentric clamping of the cores. When compressed air is fed into the cylinder chamber, the expansion ledges on the circumference of the shaft expand.

The expansion takes place with time delay produced by the flat bladders under the expansion ledges. These flat bladders ensure uniform torque transmission into every core, however narrow it may be.

After termination of the working procedure, the expansion and centering ledges are retracted to their initial position either by internal springs or by pressure application to the piston back side, so that the shaft can be taken out of the core.



## Features and advantages

- Concentric clamping of even the narrowest cores by proven mechanical Vorwald expansion system, thus ensures steady running of the reels, even with heavy reels and high web speeds
- Transmission of highest torques by pneumatic expansion ledges
- Special dimensions possible on inquiry
- Simple pneumatic actuation of the expansion mechanism

- Quick expansion and release, because only small amounts of air are required
- High true running accuracy
- Minimised bending by maximised moments of inertia
- Very little maintenance required

Available shaft diameters  
in the range from 148 to 600 mm

