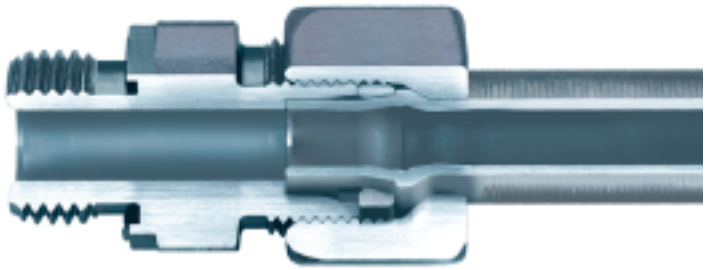
EO2-FORM



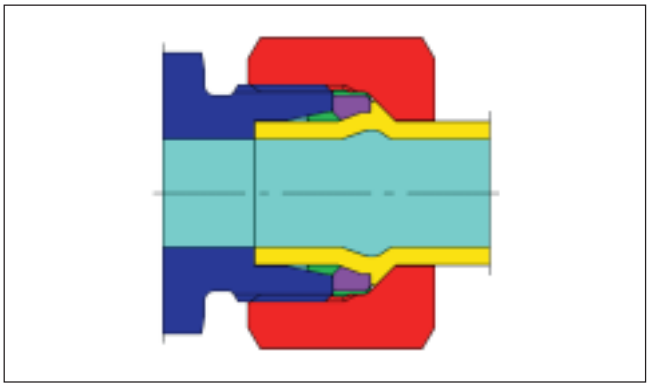
Introduction

EO2-FORM is the new high pressure formed tube Generation of the Tube Fittings Division Europe. As with EO2-Plus, it is designed in to eliminate leakage in all fluid systems, by using elastomeric sealing systems.

The common feature of all EO2-FORM connections are the EO2 seal elements (Dry Technology) as well as the new cold forming process, that gives extreme rigidity and low tightening torques. The seals are now also available in FKM (e.g. Viton®) for applications with higher temperatures or aggressive media.

Through EO2-FORM, elastomeric sealing technology is made available even where bite-type connectors are not popular, like in hydraulic presses, cranes, lifts or ship canal locks. Compared to welding or brazing, the EO2-FORM process is faster and easier. It does not require special tube treatment, heating or chemicals.

EO2-FORM is designed for metric tube and fully interchangeable to the complete Ermeto Original product range according to ISO 8434-1 / DIN 2353. EO2-FORM is available in “L”- and “S”-Series.



**The new EO2-FORM connection:
Extreme rigidity and low tightening torques**

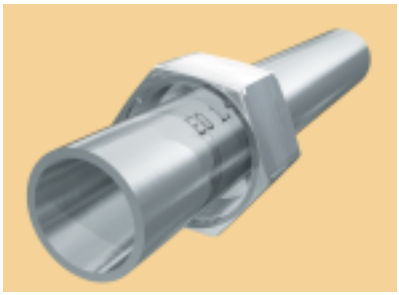
The EO2-FORM F2 machine

Function of EO2-FORM

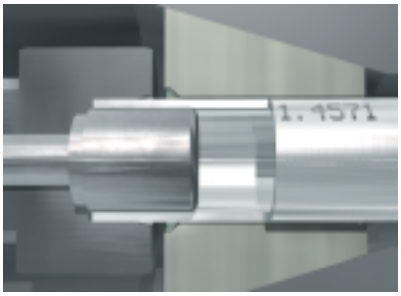
EO-2/EO2-FORM system

EO2-FORM is not a stand-alone product. It has been developed as an extension of the proven EO2-Plus system product range. All EO2-FORM components like nuts, seals and fitting bodies come from the EO2-Plus program. The only investment needed is the forming machine, which pays off quickly as it reduces assembly time and effort. Assembly characteristics of EO2-FORM are similar to

The EO2-FORM process

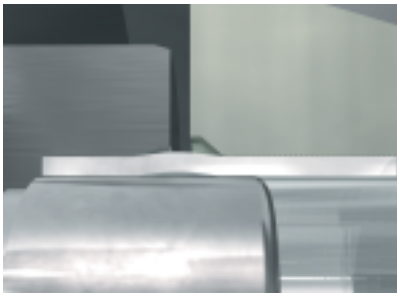


Tube end is prepared and equipped with EO nut



Tube is inserted into the tools until it firmly touches the stop at the end

After starting the process, the dies clamp the tube and the forming pin starts to move forward

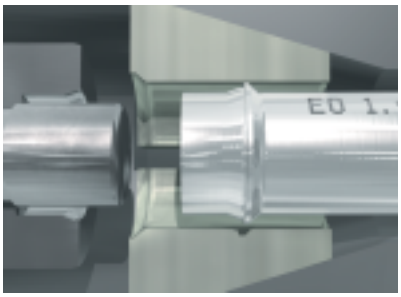


While moving, the pin is continuously forming the tube wall and compressing the material

The tool shape defines the outer contour of the formed tube wall

The inner contour also gets slightly deformed but remains smooth and unrestricted for good flow characteristics

As soon as the moving pin touches the clamping jaws, the forming process is completed



The tube end is released and ready for attaching the EO-2 seal

Installation is made in the fitting body

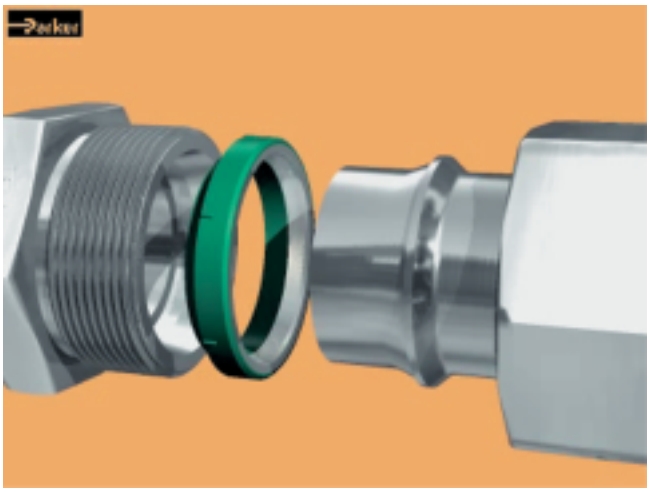
EO2-Plus too. This allows the customer to use both products for his hydraulic pipework without increasing stock or confusing workfloor engineers with new components.

Elastomeric sealing
For EO2-FORM, the same sealing ring “DOZ” is used as for EO2-Plus. The high volume elastomeric seal assures a hermetically sealed tube joint. It is located in between the inner cone of the fitting body and the tube surface, thus blocking the only possible leak path. Due to its large cross section, the seal effectively compensates for all manufacturing tolerances between the tube and fitting cone.

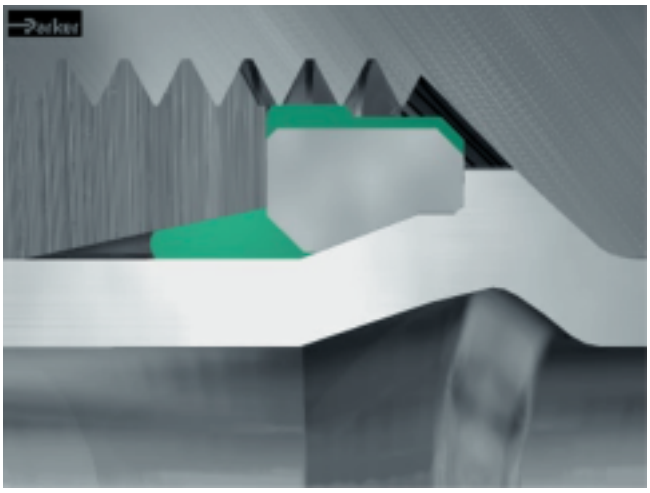
The sealing effect is pressure supported which makes the EO2-FORM fitting ideal for high pressure applications. The static compression also eliminates air-ingress into the fluid system in vacuum conditions.

Elastomerically sealed EO2-FORM fittings do not require any retightening even in heavy-duty applications. Seal extrusion is prevented by proper housing without gaps or dead volume areas. The sealing lip is bonded to a metallic support ring.

Cold-formed tube
The cold-forming of the tube is carried out by the EO2-FORM machine. Machine operation and tool setup are optimised for short cycle times, which makes the process easy and fast. The tube is connected when the sealing ring is fixed and the nut is tightened.
The working contact area of the EO2-FORM connection is the flat front surface of the metallic support ring which is made of heat-treated, high-strength steel. This provides superior mechanical strength without settling, loosening or need for re-tightening.



Before tightening the nut

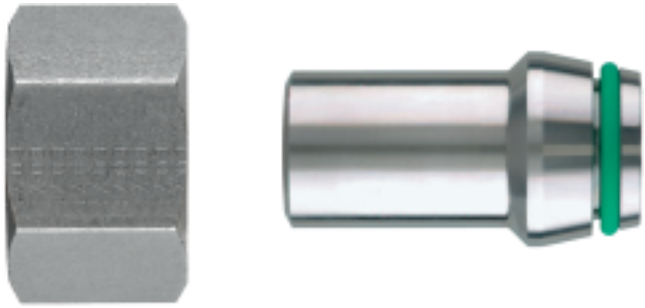


After tightening the nut

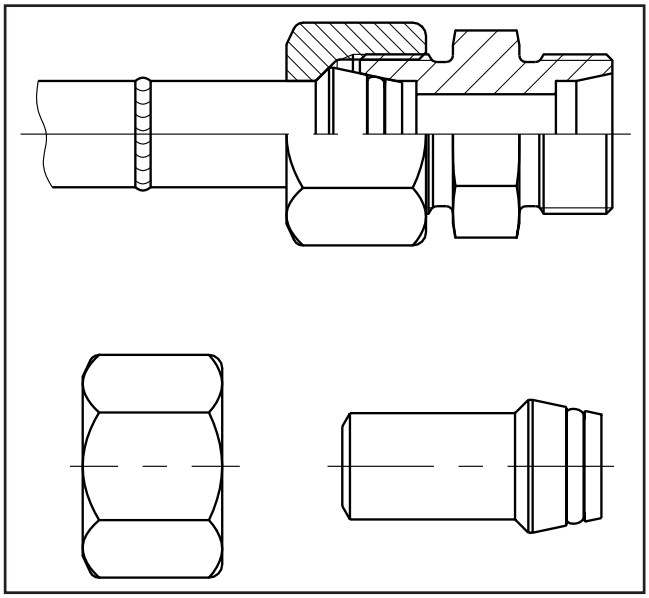
Features, advantages and benefits of the EO2-FORM fitting system

- **System solution** – No additional items need to be purchased or stocked on top of the existing EO-2 product range. Assembly characteristics of EO-2 FORM are similar to EO2-Plus, too. Therefore, EO2-FORM can be introduced with minimum effort.
- **Flexible concept** – The product family of EO-2 and EO2-FORM allows the application of the optimum product within a complex hydraulic system or a whole manufacturing facility. EO2-FORM can be used for heavy duty applications like presses, EO-2 is ideal for general hydraulic and pneumatic pipework. This allows maximum total system performance with minimum component, assembly and stocking cost.
- **No risk** – EO2-FORM technology is based on the proven EO-2 technology. All components and the assembly technology are approved. The customer does not have to test a new system.
- **Highest pressure performance** – Due to the application of even better materials combined with the special processing of individual components, EO2-FORM can be used in applications of up to 800 bar (S series) and 500 bar (L series). EO2-FORM considerably exceeds the DIN/ISO requirements and guarantees a 4-fold design factor. Thanks to the higher pressure levels, less expensive “L” series fittings can now be used instead of the heavier “S” series, which also is a benefit in limited or tight space applications.
- **Sealing capability** – The high volume elastomeric seal forms the primary sealing element, thus assuring leak-free sealing. Even low-viscosity media such as water or gas are hermetically sealed. Hydraulic systems therefore do not “sweat” at the fitting joints.
- **No phantom leaks** – Lubrication is not mandatory for the assembly of steel EO weld nipples. The machine operator will not be irritated about lubricant coming out of the fittings once the hydraulic system gets hot.
- **Universal** – The EO2-FORM machine can cold-form all common steel tubes used in hydraulic systems (the EO2-FORM process also allows the use of stainless steel and exotic materials such as CuNiFe; please ask for separate catalogue). EO2-FORM tools cover metric tube from 6 to 42 mm OD. Thin wall tube of 1 mm wall thickness can be formed, too.
- **Superior vibration resistance** – The new EO2-FORM process achieves a smooth structural transformation of the tube wall allowing superior vibration resistance.
- **Durability** – The elastomeric seal does not require any re-tightening even after years of operation under extreme working conditions.
- **Efficient** – Compared to welding or brazing, EO2-FORM is much less time consuming. Special tube preparation and finishing are not necessary. Forming uses only a fraction of the energy needed for brazing or welding.
- **Quality** – Tube clamping and tooling are fully automated. Therefore, high and consistent quality is achieved without manual adjustment.
- **Noise reduction** – Compared to other forming methods, the EO2-FORM process results in a smooth inner contour of the tube that does not allow the accumulation of air, dirt or other sources of trouble. Less pressure drop, heat and noise is created.
- **Re-usability** – EO2-FORM connections can be disassembled and reassembled many times. There is no wear or widening of the vulnerable fitting inner cone.
- **Approved** – Both, EO-2 high pressure tube fittings and the EO2-FORM process are tested and approved by independent organisations such as Germanischer Lloyd and Det Norske Veritas (DNV).
- **Small bending radii** – The compact clamping device and special dies are suitable for forming short tube ends.
- **Clean** – The EO2-FORM process is environmentally clean and safe. As no heat is used, hazards from chemicals, fumes or heat do not occur.

EO weld nipple



The leakfree performance of EO Weld nipples is assured by an O-ring seal.



EO-Weld Nipples match to all fittings of the wide EO-range.

Introduction

EO-weld nipples have been introduced to the market in the late 60's. The simple bite ferrules off the 60's were designed for hydraulic applications of pre-war time and did not match growing market demands on high pressure performance, impulse and vibration resistance. Also, the single bite ferrule was easy to over- or undertighten. Most assembly workshops could not afford assembly machines so that large size fittings often failed due to underassembly. Still, European customers preferred to stay with the established EO fitting body range, as it provides unbeaten advantages like: full metric system, repair possible with just two wrenches and 3 series of different design and pressure performance.

EO weld nipples provide all these benefits based on replacing the bite type ring by a welded connection. Today, modern solutions like EO2-FORM and O-Lok® provide the same performance without the effort of welding.

Applications

EO weld nipples are used for applications where the advantages of the EO program are appreciated and the rigidity of a solid weld connection is required. EO weld nipples are traditionally used for heavy duty applications such as hydraulic presses, mining, steel mills and shipbuilding.

Today, many users of weld nipples are switching to modern "Dry Technology" fittings using reliable assembly methods such as O-Lok®/Parflange® or EO-2/EOMAT.

Function of the EO weld nipple

The wide EO fitting range allows welded tube connections. Therefore, the EO weld nipple has to be welded onto the tube end.

Using the standard EO nut, this weld nipple can then be connected to the tube joint of any EO tube fitting.

EO weld nipples are available for L and S-series tubes of 6–38/42 mm diameter. A broad range of weld nipple fittings including reducers or elbows covers most applications.

The use of EO weld nipples allows remakeable pipe systems based on rigid weld connections.

Features, advantages and benefits of the EO weld nipple

EO weld nipples feature most advantages of the attractive EO fitting program. The specific benefits of the EO weld nipple program are:

- **Low quality tube** – Unlike bite-type or flared fittings, dimensional tolerances and rough tube surface are not very critical. Therefore weld nipples are suitable for countries where only poor quality tube is available.
- **Sealing capability** – An elastomeric seal forms the primary sealing element, thus assuring leakfree sealing. Even low-viscosity media such as water or gas are hermetically sealed. Hydraulic systems therefore do not "sweat" at fittings.
- **Durability** – The O-ring seal is assembled with a high initial compression. It does not require any retightening

even after years of operation under extreme working conditions.

- **Failure mode –** Unlike bite type fittings there is little danger of tube blow off if the fitting is not properly tightened. A loose joint shows excessive leakage before total failure.

- **Reusability/Remakeability** – EO weld nipples can be disassembled and reassembled many times. There is no wear or widening up of vulnerable inner fitting cone. Damaged O-rings can easily be replaced.

- **Smooth edge** – Under extreme working conditions, weld nipples are most likely to crack at the dimensional step just under the nut. In an additional rolling process this critical edge is smoothened for increased vibration strength.

- **Stress-free** – By welding, little deviations on tube cutting or bending can be compensated. Tension-free pipework is not likely to break even under extreme working conditions.

- **Welding process** – EO weld nipples are designed to be used for most popular welding processes.