

Leading joining technology



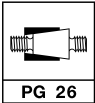
ExpaTen

The ideal connecting bolt

Free from backlash – Powerful – Reusable



ExpaTen – more
than just a bolt.



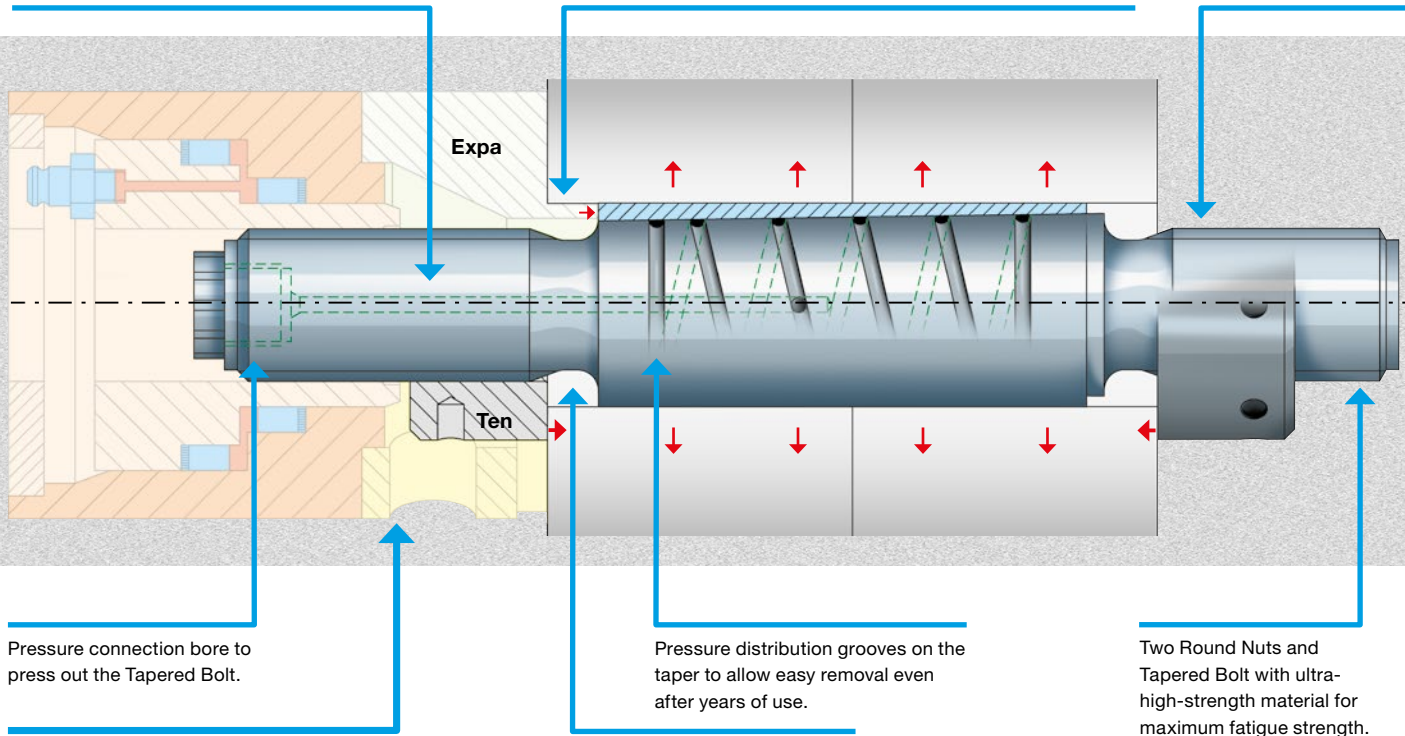
ExpaTen

Expa = Expansion = 100% positive locking in the flange bore
Ten = Tension = frictional connection for the joint

Tapered Bolt made of high-strength quenched and tempered steel to absorb radial shear forces and a high axial pre-tensioning force.

Positioning ring to hold the Conical Sleeve in position while the Tapered Bolt is being pulled into the Conical Sleeve. This results in expansion (Expa) of the sleeve and produces a press fit in the bore.

Conical Sleeve of high tensile and ductile steel for maximum shear strength.



Pressure connection bore to press out the Tapered Bolt.

SCHAAF Bolt Tensioner (SSV) up to 4000 bar hydraulic pressure.

Pressure distribution grooves on the taper to allow easy removal even after years of use.

Guaranteed reusability even after years of use. Again and again.

Two Round Nuts and Tapered Bolt with ultra-high-strength material for maximum fatigue strength.

Advantages

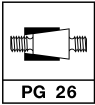
Expansion and pretensioning result in the following advantages compared to conventional bolts:

- 100% positive locking and frictional connection all the time after mounting, no slipping between the flanges
- Simple and quick installation and removal of **ExpaTen** even after years of use – nearly unlimited times
- Reusable after removal, again and again – no sparebolts required
- Torsionally and flexurally rigid connection even with sudden changes in the rotational speed, the torque, direction of rotation or direction of load
- No jammed or oversized bolts any longer
- High torque transmission, completely free from backlash
- Reduction of flange dimensions possible due to fewer number of bolts
- Maximum torque and shear force transmission in minimum space
- Tolerance for mounting is 0.05 to 0.2 % of the bore diameter
- Simply machining of the flange holes is sufficient
- Additional standard bolts can be tightened with the same Bolt Tensioner

Areas of Application

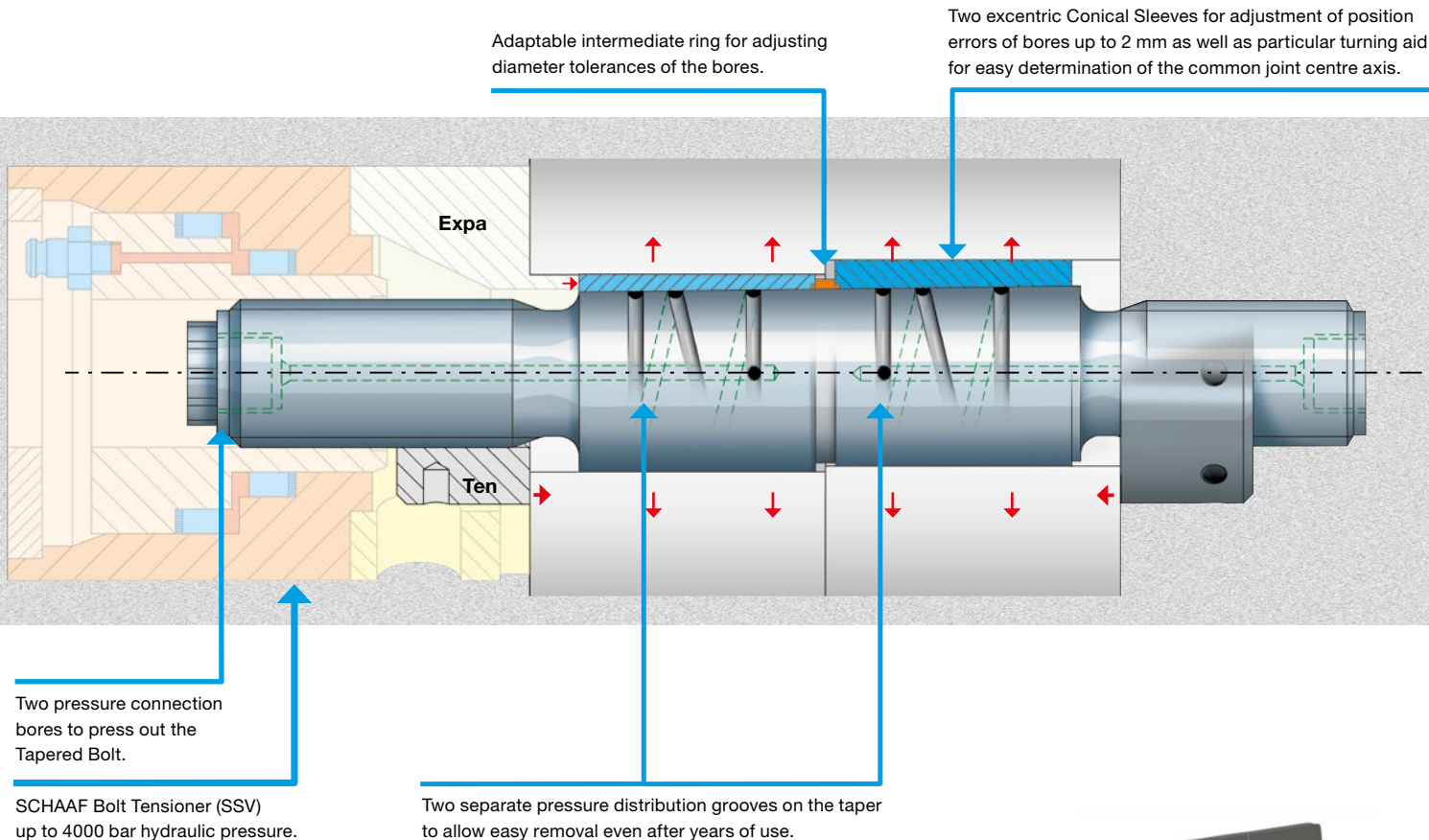
SCHAAF **ExpaTen** Bolts are the optimum solution wherever high forces (torques) must be transmitted and, at the same time, easy removal must be ensured.

For example ship drive shafts, powerplants, crushers, steel and non steel mills and windturbines.



ExpaTen 2

Ideal flange connection for misaligned flange bores and / or unequal bore diameters



Advantages

ExpaTen 2 is the further development of ExpaTen and thus offers all the advantages for the ideal flange connection and additionally:

- Adjustment of position errors of bores up to 2 mm
- Adjustment of diameter tolerances of bores up to 0.5 mm
- No need for combined bore adaption of both flange bores when mounting
- Cost-saving due to reduced mounting and dismounting time
- Simple and quick installation and removal of **ExpaTen 2**, as well, even after years of use - nearly unlimited times
- Reusable after removal, again and again is also warranted with **ExpaTen 2** - no sparebolts required

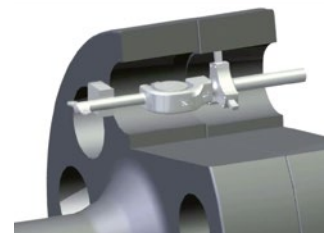
ExpaTen 2 can be used for:

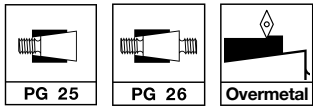
- Inner bores which are exactly centric to another
- Maximum misalignment of 2 mm
- Different bore diameters in the flanges
- Different diameters and misalignment of the bores in the flanges

Areas of Application

SCHAAF **ExpaTen 2** is the optimum solution wherever flange bores can or shall not be refinished and a centric misalignment or a bore diameter difference is given. A 100 % positive locking is achieved e. g. with ship drive shafts, powerplants, crushers, steel and non steel mills and windturbines.

Software-supported calculations of the turning angle and the mounting process, including documentation.





Variations

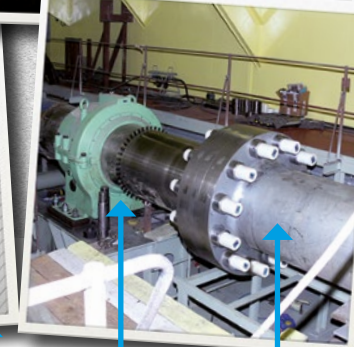
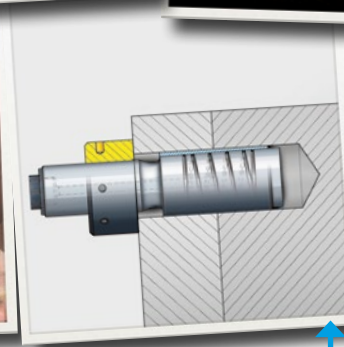
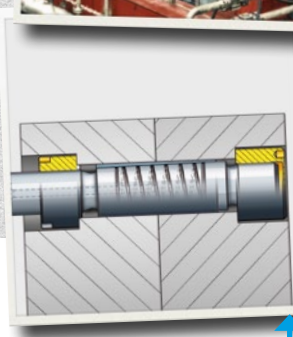
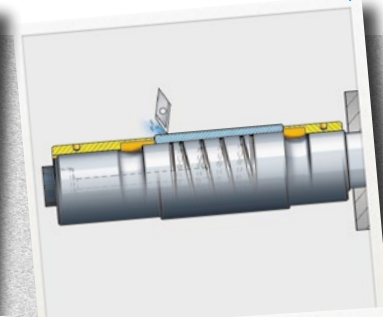
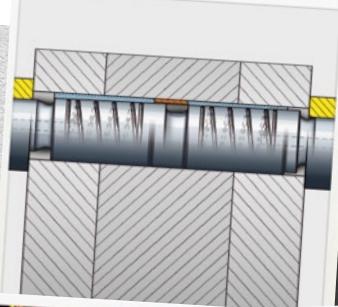
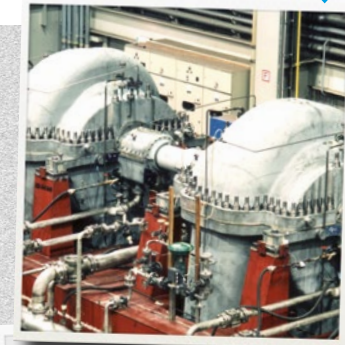
for customised industry solutions

ExpaTen at a steam turbine shaft line.

ExpaTen 2 with 2 conical sleeves for force transmission in 2 shear areas.

ExpaBolt at a wind power plant. Pure shear force transmission (torque) for higher safety.

Overmetal for optimum sleeve correction for deviant flange bores - directly in situ while mounting.



ExpaTen ETC for turbine-generator connection. Flat front surface for high-speed applications in order to avoid turbulences.

ExpaTen in Ø 270 x 6700 mm for a threeparted open - die forging press table.


ExpaTen with 2 Conical Sleeves for ship shaft drive.

ExpaBolt for flange-component-connection. Full expansion for pressfit.

ExpaBolt to fasten bearing seat for shear force transmission.

Overmetal ExpaTen at a three-parted open - die forging press table.

Overmetal ExpaTen for ship shaft flanges, being bored up together.

 This ExpaTen and accessory equipment is a milestone in the research and development of SCHAFF hydraulic high-pressure equipment and shows the world leadership in that field.

Quality Assurance

All **ExpaTen** Bolts are checked for material quality, dimensional accuracy, correct functioning and load-resistance. During order execution, they are subject to continuous quality assurance measures and are supplied together with detailed technical documentation.

Services

ExpaTen Bolts are, of course, supplied packaged, ready for installation and use.

SCHAAF **ExpaTen** Bolts are user-friendly, reliable, and manufactured in accordance with the highest level of technical know-how. Our highly-motivated staff would be pleased to train your personnel, in situ or at our works, in mounting and dismantling the bolts.

Versions

The standard version of the SCHAAF **ExpaTen** comprises the following components:

- Tapered Bolt and Conical Sleeve of high-strength quenched and tempered steel for maximum shear strength and axial load capacity
- Two ultra-high-strength Round Nuts
- Fine thread for maximum fatigue strength
- Pressure connection bore and pressure distribution grooves on the taper for easy removal of the Tapered Bolt

Complete solution from SCHAAF

The accessories for the **ExpaTen**, such as Bolt Tensioners, high-pressure pumps, hydraulic hoses and connection couplings, are aligned to the functions = 100 % system solution.

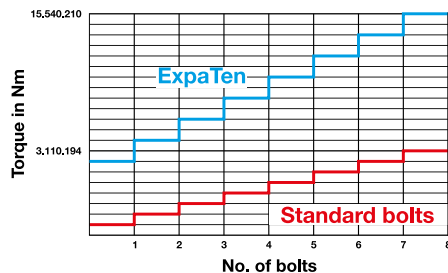
Accessories and additional product groups

- Bolt Tensioners (SSV)
- High-pressure generators: manually operated, electric, or air-operated
- High-pressure hydraulic hoses
- Couplings, nipples, adapters and distributor blocks for pressures up to 4,000 bar
- TTG Nuts and Bolts, ShrinkNut
- MSN – Multiple Stud Nuts
- GripCon
- GripLoc, GripLoc - MSN
- Mounting aids such as centering pin and lifting devices, or as requested by the customer
- Protection caps

Certificates and Acceptance Tests

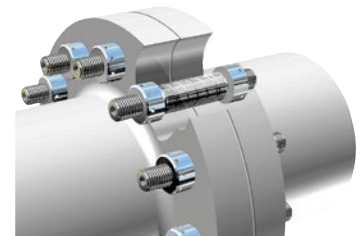
- Approvals from classification societies
- Material test reports
- Specific test reports
- Certificates as per special customer requirements

Example: Possible torque transmission with $\varnothing 95$ mm bolts on a $\varnothing 870$ mm pitch circle:



SCHAAF **ExpaTen** Bolts provide 5 times higher safety than standard bolts.

SCHAAF is certified in accordance with DIN EN ISO 9001 and, in addition, fulfils all requirements of all classification societies.



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