Tender Specification for large tolerance fittings for use in fluids like potable water and sewage & waste water; Georg Fischer WAGA MULTI/JOINT® 3000 Plus or equal.

Scope:
This tender specification specifies the requirements for large tolerance couplings, flange adaptors and other fittings (hereinafter called mechanical joints), restraint or non restraint, sized DN50 up to and including DN1025, for conveying fluids like potable water, waste water and cooling water, suitable for fluid temperatures between -5˚C and 50˚C, suitable to be installed under and above ground, and inside and outside buildings.

The mechanical joints shall be constructed and certified in conformity with **EN 14525**.

Ranges:
The mechanical joints shall be suitable **for all pipe materials**, both metal and non-metal, like PE, PVC, GRP, PB, asbestos cement, copper, steel, galvanized steel, stainless steel AISI 304 and AISI 316, grey cast iron, (ductile) cast iron and concrete.

Mechanical joints shall be designed to cover following pipe outside diameters per nominal diameter:

DN-size	Minimum range (mm)	Maximum range (mm)	Minimum length coupling (mm)	Minimum length flange adaptor (mm)
DN50	**46**	**71**	206	165
DN65	**63**	**90**	215	170
DN80	**84**	**105**	218	170
DN100	**104**	**132**	228	173
DN125	**132**	**155**	240	192
DN150	**154**	**192**	278	211
DN200	**192**	**232**	303	221
DN225	**230**	**268**	350	216
DN250	**267**	**310**	377	264
DN300	**315**	**356**	384	293
DN350	**352**	**393**	380	291
DN400	**392**	**433**	380	297
DN425	**432**	**464**	460	330
DN450	**450**	**482**	460	330
DN475	**481**	**513**	460	360
DN500	**500**	**532**	460	332
DN550	**548**	**580**	460	330
DN600	**605**	**637**	480	339
DN625	**630**	**662**	657	446
DN675	**665**	**697**	660	509
DN700	**709**	**741**	667	434
DN750	**745**	**777**	667	434
DN800	**799**	**831**	667	431
DN825	**837**	**869**	667	455
DN900	**899**	**931**	730	474
DN925	**939**	**971**	730	517
DN1000	**994**	**1026**	730	474
DN1025	**1042**	**1074**	730	517

Separated bolt sets:

Couplings shall have **separate bolt sets (misaligned DN50-DN200)** for each socket end, enabling connecting 1 pipe end at a time and ensuring optimal bolt torque at each pipe end.

Possibility of changing configuration on the spot
The mechanical joint shall offer **the possibility of changing the configuration** from restraint to non restraint or vice versa at the time of installation, by either inserting or removing gripping elements on the spot.

Material specifications:

Body & clamp(ing) rings:	All metal parts, except the gripping elements, shall be made of ductile iron in conformity with **EN-GJS-450-10-HB200.**
Coating:	Coating shall be a **Resicoat® RT9000R4 epoxy powder coating** or equal, with a **minimum layer thickness of 250 micron** and chemical resistance of pH 2 up to pH 13. **Coating shall be approved by an internationally accepted institute for potable water or other fluids (e.g. WRc, KIWA, DVGW) and shall be certified according the requirements of GSK (Association for Excellent Corrosion Protection with Epoxy resin powder coating) in accordance with DIN 3476 (P), DIN 30677-2 and EN 14901.**
Bolts, Nuts and washers:	- Bolts, nuts and washers shall be made of stainless steel A2-70 (AISI 304) or A4-80 (AISI 316). - Bolts shall have a **non-chemical dry anti-friction coating to prevent cold- welding due to fretting.** - Nuts are galvanized and passivated to prevent galling
Rubber gasket:	- EPDM according to **EN 681-1**, for the **type WA** for cold potable water supply up to 50°C. - NBR according to **EN 682** for cold (non) potable water supply, drainage, sewerage and rainwater pipes (continuous flow up to 45°C) with oil resistance.
Gripping elements:	- Gripping elements shall be made of stainless steel.
Flanges:	- Flanges shall be constructed in such a way that they can be attached to flanges from which the dimensions and tolerances comply to **EN 1092-2.** - Flange face shall have concentric grooves. For optimal seal positioning and sealing.
Pressures:	- Non restraint: Max. working pressure: 25 bar / 16 bar - Restraint: Max. working pressure: 16 bar / 10 bar Depending on DN-size and/or pipe material.
Angular deflection:	8º per side, based on middle of range

Ambient temperature at installation:
The mechanical joints with EPDM gasket shall be suitable for installation at ambient temperatures between -20°C and +50°C.

Marking requirements:
All mechanical joints shall be legibly and durably marked. **Marks shall be cast on the body** and shall bear at least the following information:

- The manufacturer's name or mark
- Identification of the year of manufacture
- Identification of ductile cast iron
- Identification of DN size
- Identification of the range of external diameters that the mechanical can connect.

Marking requirements on rubber gasket:
All rubber gaskets shall be legibly and durably marked. The rubber gasket shall bear at least the following information:

- The manufacturer's name or mark
- Identification of the year of manufacture
- Identification of the range of external diameters over which the mechanical joint works.
- The type of gasket (EPDM or NBR)
- The EN-standard

Additional information to be supplied with the mechanical joint:
The following information shall be supplied **on or with** each mechanical joint:

installation instructions
maximum joint gap
maximum allowable angular deflection (8º per side, based on middle of range)
pipe materials for which the mechanical joint is intended to be used with
non restrained and restrained joints.
need for supporting sleeves (inserts)
bolt torque
information about reusability of the mechanical joint
code for traceability

Quality assurance:
The manufacturer's quality system shall conform to **ISO 9001:2015.**
The manufacturer's environmental system shall conform to **ISO 14001:2015.**
The manufacturer's international occupational health and safety management system specification shall conform to **ISO 45001:2018**

Technical support:
Product training and technical information

The manufacturer or the sales representative shall provide a specialized theoretical and active practical product training given by qualified instructors to enable installers of the above mentioned products to be able to understand and use the products and associated tooling correctly and efficiently under site conditions.

In addition to the main subject matter all training courses shall additionally cover other associated distribution pipeline products as well as routine repair and maintenance procedures.

Additional training courses for inspectors, group leaders and teaching staff are to be provided upon request.

The manufacturer has to provide accurate and easy-to-understand operating instructions in at least one internationally recognized language, which can be used at any subsequent time for reference purposes.

The manufacturer must have in-house test facilities to execute basic tests.

Hygienic packaging / protection from production to point of use:
The manufacturer shall supply the product with a hygienic packaging / protection. The hygienic packaging / protection will be applied during the production / assembly process. The hygienic packaging / protection shall protect the product from dirt, dust and other contaminants during transport and storage till point of use where the hygienic packaging / protection will be removed.

Certification:
Products shall bear the EN 14525 certificate of KIWA (BRL-775), ÖVGW (QS-W 503) and SVGW.
Products shall bear the NSF 61 certificate of NSF.
Products with NBR gasket shall bear the Watermark of KIWA for use in potable water.