

Position Paper of the EHEDG SubCom Certification:

Easy Cleanable Pipe Couplings and Process Connections

(Version 6, January 2024)

When integrating hygienic process components or equipment into a production line, it is crucial to ensure that these elements are connected in a way that not only maintains hygiene, but also facilitates easy cleaning. This approach is essential to maintain process integrity and ensure product safety. Process connections or pipe couplings with good hygienic and easy-to-clean design are specified according to EHEDG Guidelines 8 (Hygienic Design Principles), 10 (Equipment in Closed Processes), 16 (Pipe Couplings) and 48 (Elastomeric Seals) and their performance in cleaning in place can be assessed according to EHEDG Guideline 2.

Critical to the design and connection are:

- the avoidance of any crevices or protrusions of the seal greater than 0.2 mm,
- provision of an axial stop with controlled compression of the seal, and
- a means of centering of the flanges.

This list is not intended to be exhaustive and may be subject to revision at any time. If additional connections have been successfully tested for in-place cleanability, they may be used and added to the following list.

Avoidance of dead legs is important when installing parts of equipment or sensors with process connections in closed equipment for the processing of liquid food (see EHEDG GL. 10).

Pipeline connection

In pipelines, the length of a dead leg must be less than the inner diameter of the dead leg. If the sensor protrudes into the dead leg, the length (L) of the dead leg must be $L \leq (D - d)$ (see Figure 1). The relevant diameter d of the sensor will vary depending on the design.

If the calculation of $L/(D - d)$ for a particular connection size results in a ratio greater than 1, then this size does not meet the requirements for certification and will be excluded from the range of sizes considered for EHEDG certification.

The orientation must allow for self-draining of liquids and should promote the evacuation of air to prevent the accumulation of air bubbles.

Tank connection

Sensors mounted in tanks should be flush with the inside of the tank wall. If there is a dead leg for technical reasons, it must be ensured that the spray from the cleaning device can reach all surfaces. The above criteria for $L \leq (D - d)$ still apply.

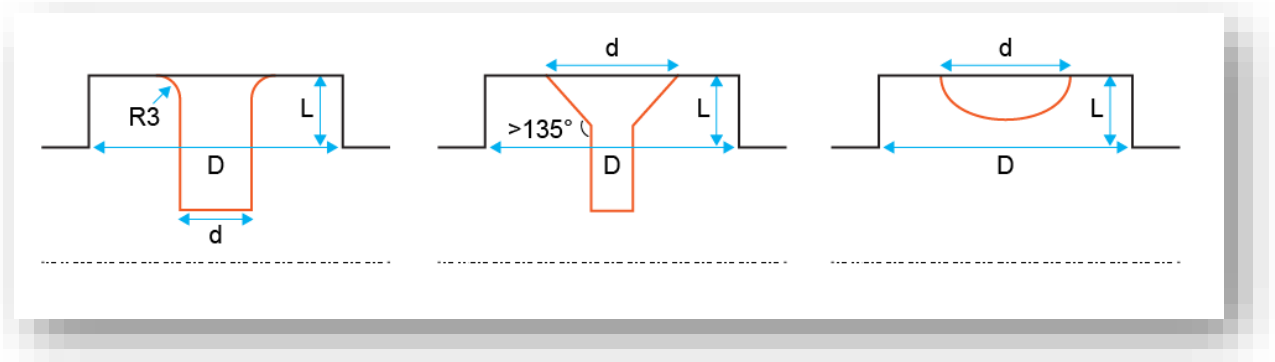


Figure 1: Different sensor designs (orange) and dimensions when placed in T-piece

Note: SubCom Certification is comprised of EHEDG Authorised Evaluation Officers, linked to the Authorised Testing Laboratories, involved in the testing, evaluation and certification of components and equipment for food processing.

Pipe couplings

DIN 11853-1:2017, Hygienic screwed pipe connection with O-ring
DIN 11853-2:2017, Hygienic flanged pipe connection with O-ring
DIN 11853-3:2017, Hygienic clamp pipe connection with O-ring

DIN 11864-1:2017, Aseptic screwed pipe connection with O-ring
DIN 11864-2:2017, Aseptic flanged pipe connection with O-ring
DIN 11864-3:2017, Aseptic clamp pipe connection with O-ring

DIN 11851 in combination with ASEPTO-STAR k-flex upgrade gaskets made of PEEK
Kieselmann GmbH, *Germany*

DIN 11851 in combination with SKS gasket set EHEDG with EPDM or FKM inner gasket
Siersema Componenten Service (S.K.S.) B.V., *The Netherlands*

DIN 32676, BS 4825 Part 3, ASME BPE Clamp, ISO 2852 (withdrawn) in combination with special Tri-Clamp seals from Combifit International B.V., *The Netherlands*

BS 4825 Part 4 (IDF joint), ISO 2853 (withdrawn) in combination with special T-seals from
Combifit International B.V., *The Netherlands*

HP-Sealcon with EPM gasket in size DN25 - DN125
GEA Tuchenhausen GmbH, *Germany*

BioConnect® with EPDM O-ring
Neumo GmbH & Co. KG, *Germany*

Process connections

In-line ball-shaped housing with EPDM gasket,
APV a SPX Brand, *Germany*

Sensor connection type BHC 3A DN38 and DN76 with EPDM O-ring,
Baumer, *Denmark*

Sensor connection type G1/2" hyg. connection with VMQ O-ring,
Baumer, *Denmark*

Process connection type CPA842 without sensor guard (Code "NB") and EPDM or FKM gasket for EHEDG certified sensors with diameter 12 mm
Endress+Hauser Conducta GmbH+Co. KG, *Germany*

Retractable assembly type CPA875 with EPDM gaskets for EHEDG certified sensors with diameter 12 mm
Endress+Hauser Conducta GmbH+Co. KG, *Germany*

Thread ISO 228 G1", 316L with EPDM O-ring
Endress + Hauser SE+Co.KG, *Germany*

Thread M24, 316L with EPDM, FKM, FFKM O-ring
Endress + Hauser SE+Co.KG, *Germany*

Pipe Connection, flush mount for M24 process connection with EPDM O-ring
Endress + Hauser SE+Co.KG, *Germany*

VARINLINE® System housing with EPDM O-ring in size N, G
GEA Tuchenhagen GmbH, *Germany*

VARINLINE® tank flange type T and P with EPDM O-ring in size B, F, N, G
GEA Tuchenhagen GmbH, *Germany*

Hygienic Socket with EPDM O-ring
Hamilton Bonaduz AG, *Switzerland*



Aseptoflex Vario process adapter for G1” pressure, flow, level and temperature ifm sensors with EPDM O-ring or PEEK sealing ring
ifm electronic GmbH, *Germany*

Process connection code 997 JUMO PEKA for sensors with FKM O-ring
JUMO GmbH & Co. KG, *Germany*

HWT2X0 weld-in process adapter with PEEK sealed sensors
Krohne Messtechnik GmbH & Co., *Germany*

InTrac pH-Holder with EPDM seals
Mettler-Toledo GmbH Process Analytics, *Switzerland*

InFit761/NC/0070/4435/D00/Si9- straight sensor probe insertion arrangement with EPDM seals
Mettler-Toledo GmbH Process Analytics, *Switzerland*
