

# INDUSTRIAL FITTINGS - couplings

## Stainless steel hygienic couplings

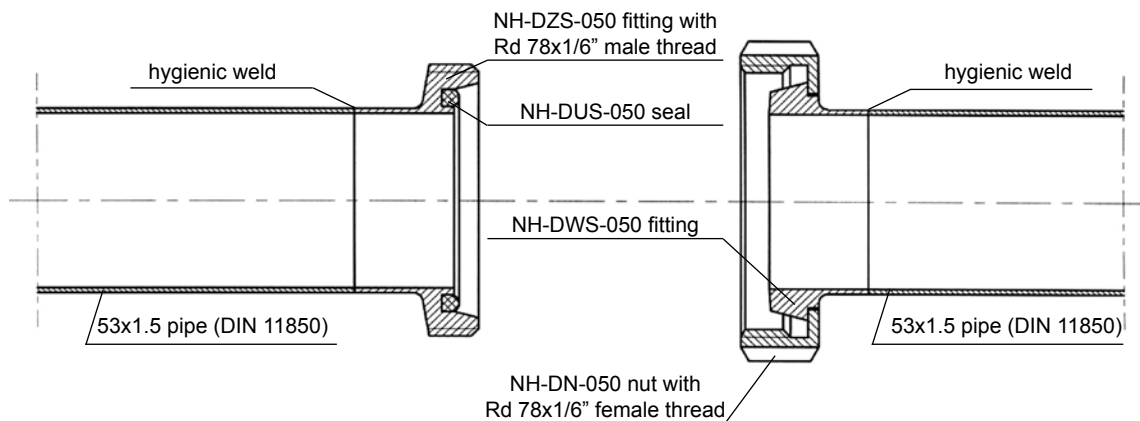


Stainless steel hygienic couplings are intended for food, pharmaceutical, cosmetics and chemical industries as well as for biotechnology. At first the couplings were primarily used in dairy and brewing industry to connect pipe installations using an internal expansion method (a pipe is pressed from the inside out into a fitting). Nowadays they are welded using methods that ensure the highest quality of the weld adequate to the hygienic requirements. The hygienic couplings come in different standards that differ in terms of the type of connection and sealing that further determine different levels of hygiene of the couplings required by various applications. The hygienic design of a coupling is defined by accessible and easy cleaning and sterilization without dismantling (CIP, SIP) and use of adequate materials. The requirements for hygienic couplings are set in several regulations and standards e.g. 3-A (3-A Sanitary Standards Incorporated), EHEDG (European Hygienic Engineering & Design Group), ASME BPE-2009 (Bioprocessing Equipment). In general, the standards require to avoid all kinds of crevices or dead spaces that may cause particles accumulation and growth of microorganisms. Internal surfaces must be smooth and nonporous. The surface roughness must not exceed  $Ra = 0.8 \mu m$  and  $Ra = 0.4 \mu m$  when the requirements for the internal surface roughness are higher. Some surfaces may need electro-polishing. Welds are subject to separate requirements. The internal folds of the surface should be smoothed out by an angle that facilitates cleaning. Seals should be the closest possible to the transferred medium avoiding crevices and the risk of product getting under the seal.

### Coupling material

Depending on the medium and level of requirements, hygienic couplings are made of AISI 304 (304L) stainless steel or (e.g. for low pH media and for higher requirements) of AISI 316 (316L) steel or other materials. Seals should be compliant with appropriate standards (e.g. FDA 21 CFR177.2600 and USP Class VI for elastomers, FDA 21 CFR 177.1550 for PTFE).

### DIN11851 couplings



Threaded couplings according to DIN11851 with a rounded thread (marked Rd) are widely used in food and chemical industry. A seal with a D-shaped cross section is a standard. In order to ensure higher level of hygiene a seal with a lip is used which fills the crevice between connected halves. Maximum working pressure (for a coupling according to DIN 11851 itself) is 40 bar (DN 10 ÷ DN 40), 25 bar (DN 50 ÷ DN 100) and 16 bar (DN 125 ÷ DN 150).