

21 - 22 November 2012

Middle East Water Leakage Summit 2012, Dubai, UAE



Water Leakage

a Thing of the Past
short comings and solutions

Water Leakage

1. The Scenario and the Analysis

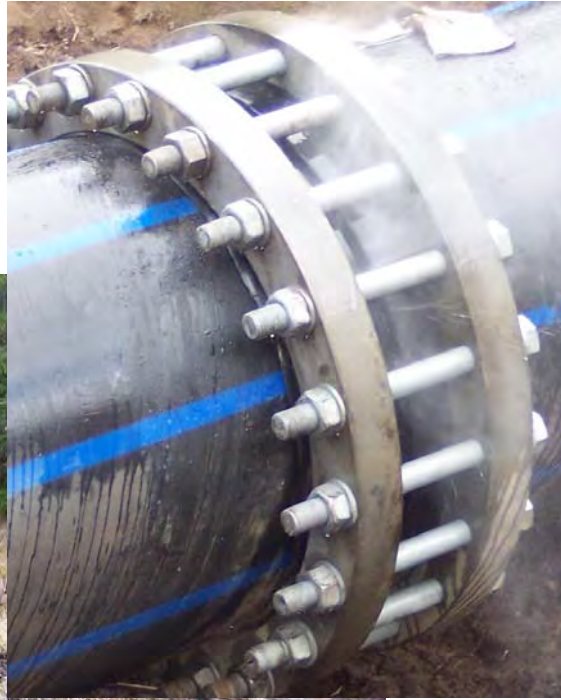
2. The Solutions

PE to Metal Connections (special flange)

PE to PE or Metal Connections (HP flange)

3. Conclusion

The Scenario



Testing performed - flanged couplings in Gothenburg



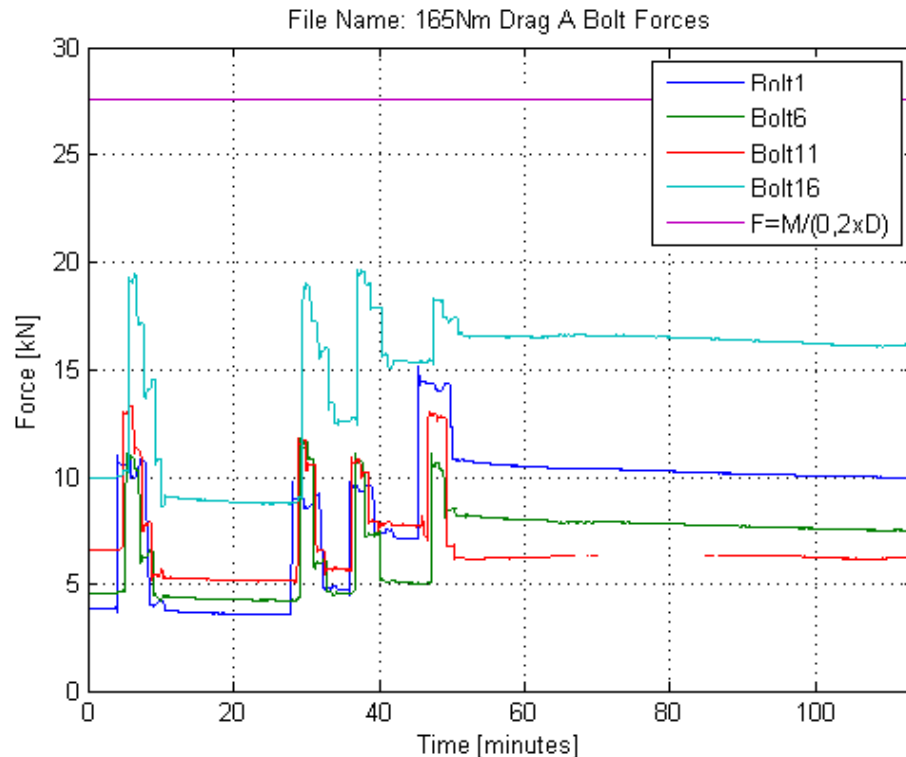
THE FUNCTIONING OF FLANGE JOINTS — FINDINGS FROM FULL SCALE EXPERIMENTS AND FEM ANALYSES

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Presented at the Plastic Pipes XVI Conference in Barcelona, September 2012

Analyses performed - flanged couplings in Gothenburg



Successive relaxation in previously tightened bolts as tightening goes on (in four rounds) **Much lower forces than expected** from the generally used formula

Unevenly distributed forces (yet the flange pressure is distributed more evenly by the steel flange)

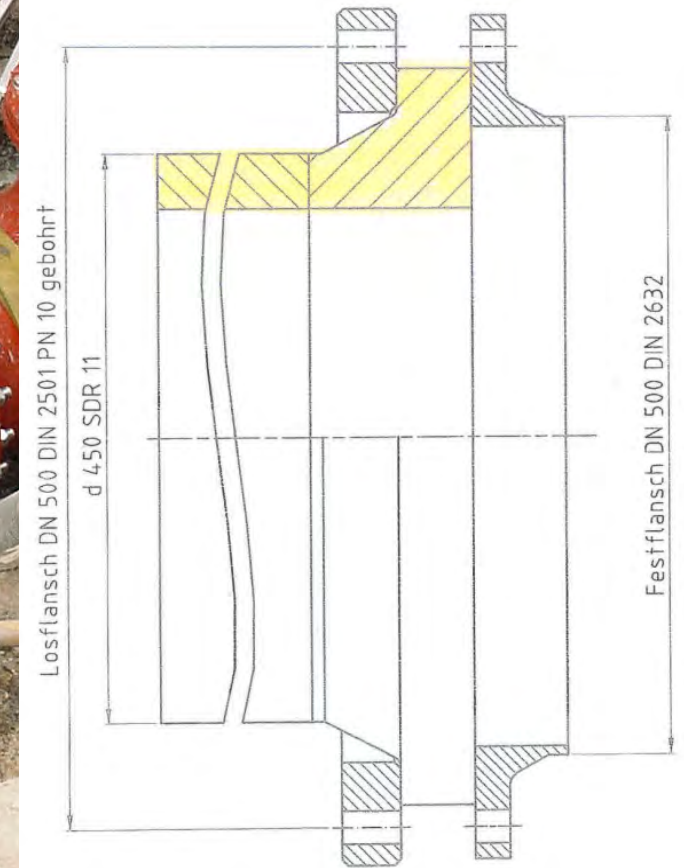
The main causes are that

- **the plastic relaxes during tightening** (just a few minutes are of significance)
- **higher friction than expected** in the threads and bolt heads/washers

PE – Metal Connections with the special flange



On-site example with standard flange DN 500/450mm

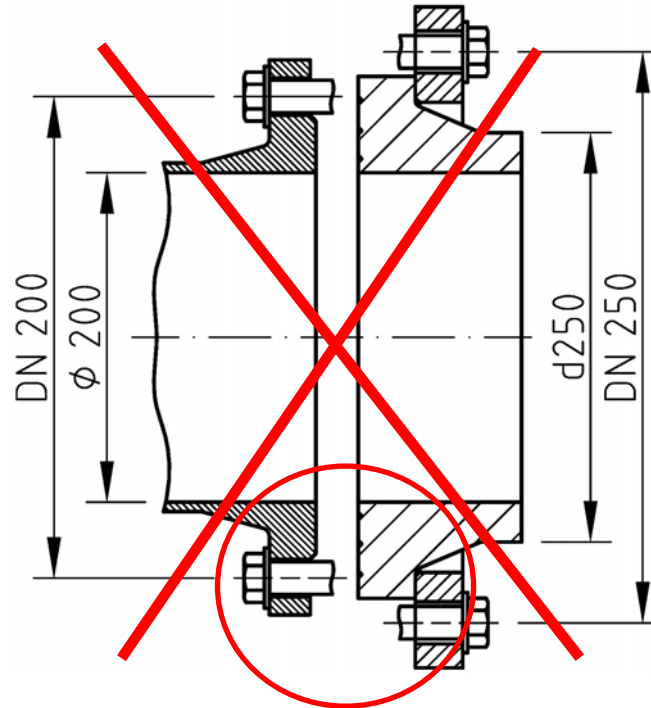
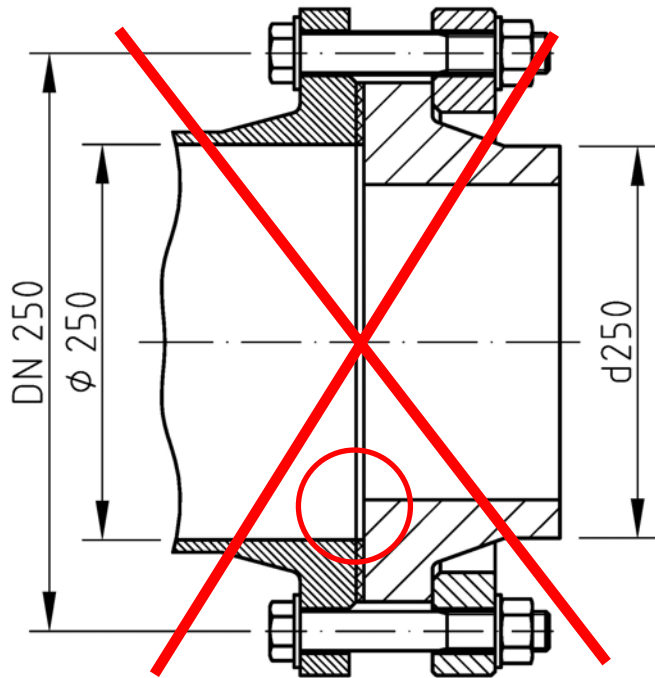


SPECIAL FLANGE CONNECTION

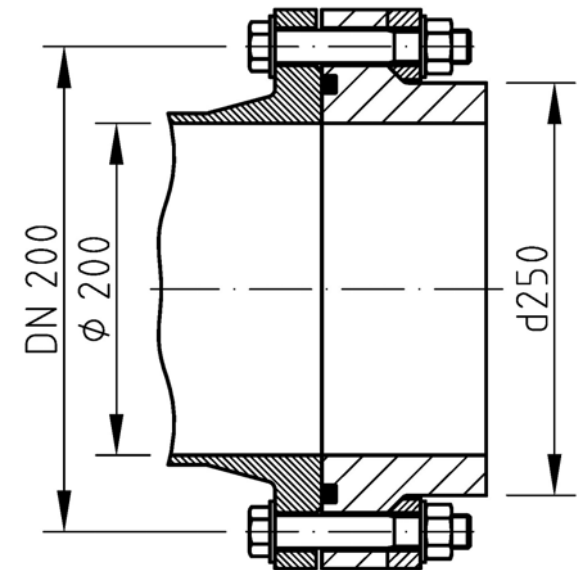
Standard stub end with backing ring

steel/ cast iron

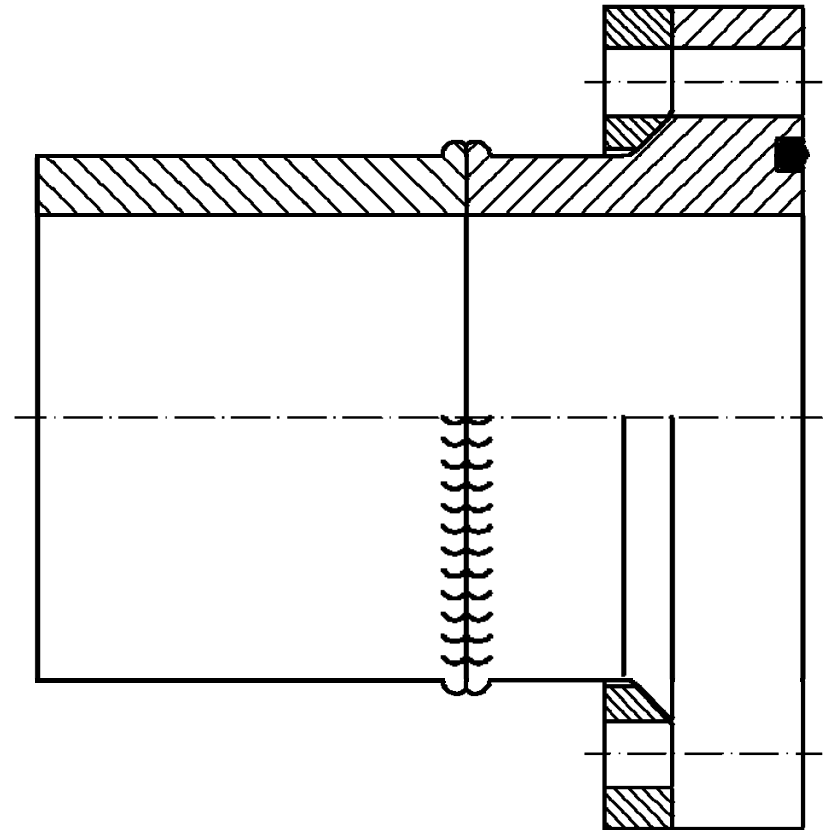
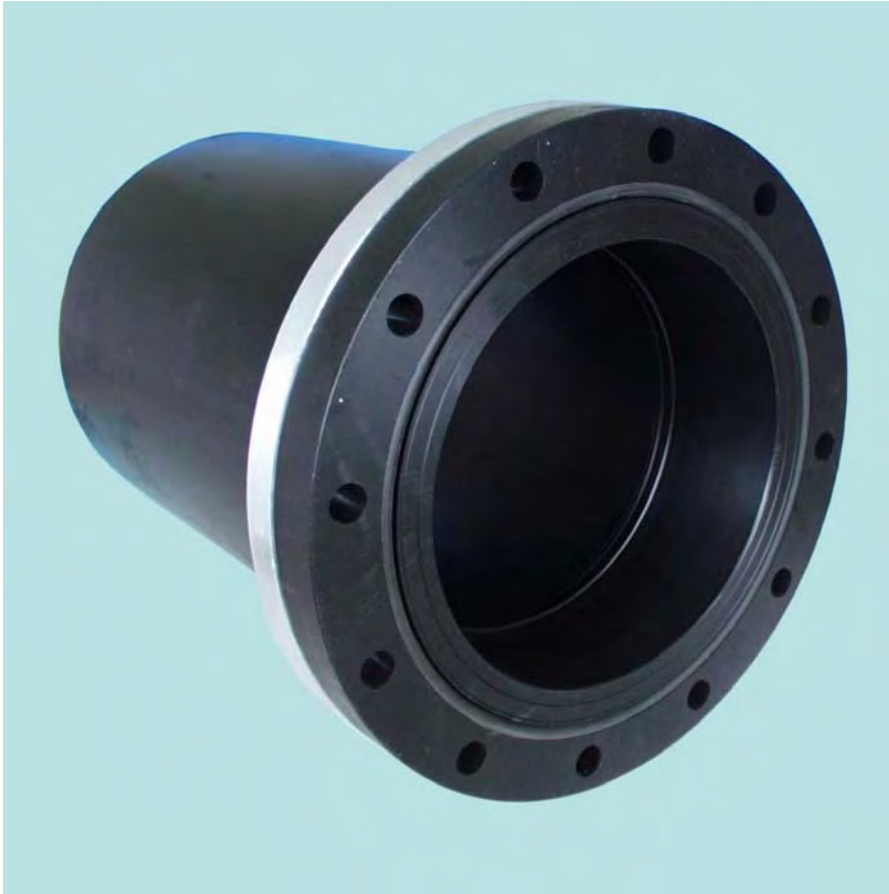
PE



Special flange connection

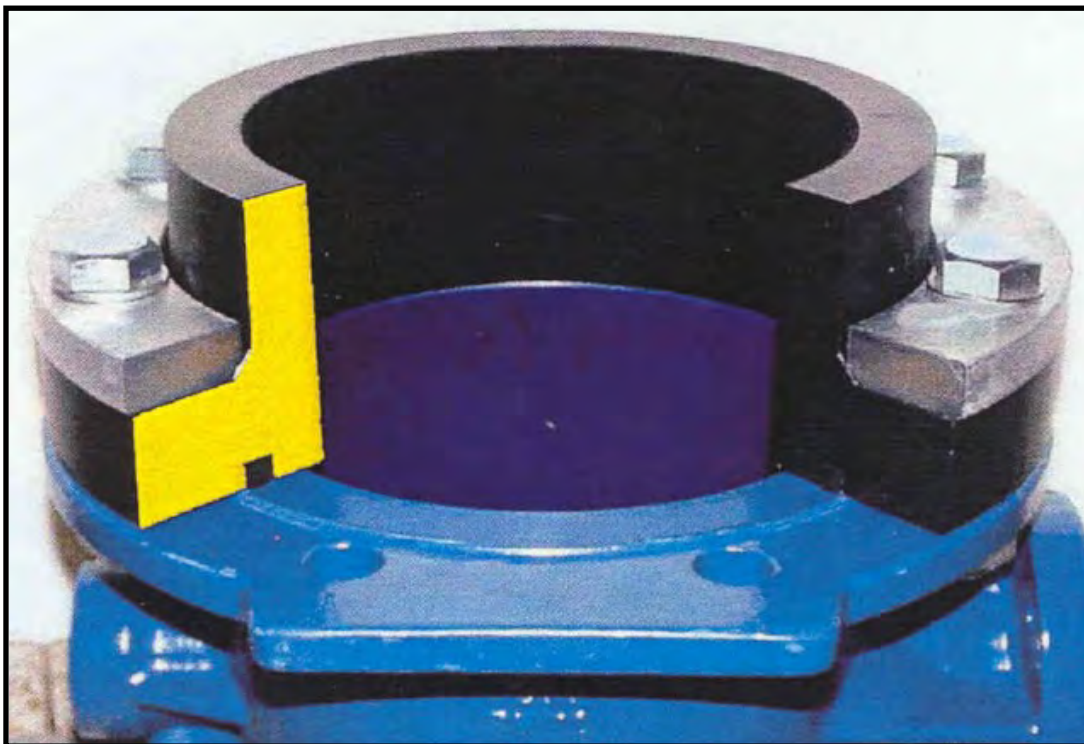


SPECIAL FLANGE CONNECTION



SPECIAL FLANGE CONNECTION

Connection with identical internal diameters of
PE-HD / PP pipe and steel / cast iron fittings



DN	d
steel/cast iron	PE
200	250mm
250	315mm*
300	355mm
350	400mm
400	450mm
400	500mm*
500	560mm
500	630mm*
600	710mm*
700	800mm*
800	900mm*
900	1000mm*
1000	1200mm*

* special solution

AIRBUS Hamburg - Firewater Main (14bar) - DN 600 / d710mm



EDEWECHT (Germany) - Branch 45° d 710/500/500 mm (10bar)



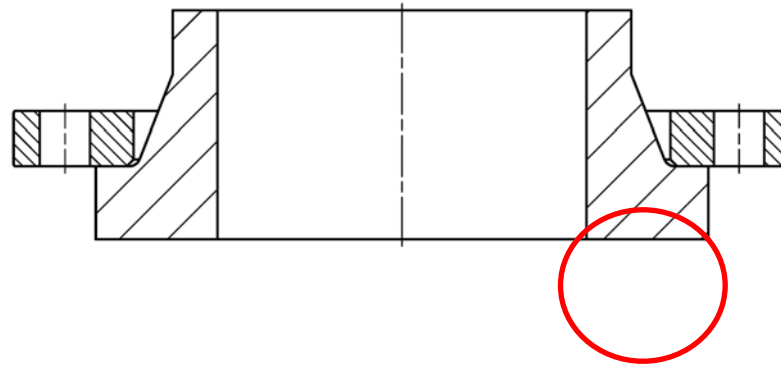
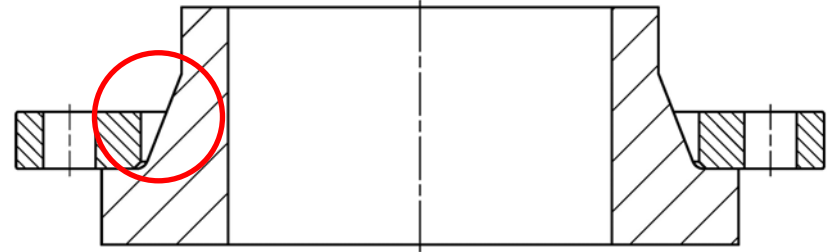
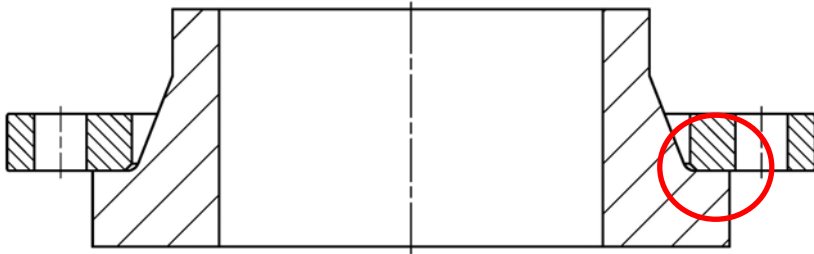
DELMENHORST - Branch d900mm SDR17, 10bar, 45°



PE – PE or Metal Connections with the HP-flange



STANDARD backing ring connection - unloaded



STANDARD backing ring connection - under pressure

- **expansion of pipe**
- **tilting seal area**

