

## Bolt Torques for Flange Fixing

### General

HDPE materials can take the same high bolting tightening torques used for steel pipelines and components.

Typical sealing materials depending on the required chemical resistance, medium temperature and pipeline operation pressure for plastic pipes are of EPDM, CSM, FPM rubbers in the shore hardness range of 70 or PTFE. Special sealings have steel reinforcements or others.

The following information is provided as a general indication only.

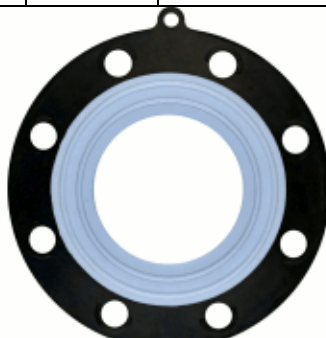
**Important in bolt fixing is torque guidance of the sealing manufacturer only.**

### Sealings

| Seal Shape         | Typical operation limits |       | Sealing min thickness mm          | Flange and neck design              |
|--------------------|--------------------------|-------|-----------------------------------|-------------------------------------|
|                    | Pressures                | Temp  |                                   |                                     |
| Flat Ring          | < 10 bar for <150        | <40°C | >2 for < DN 80<br>>3 for > DN 100 | With sealing grooves                |
|                    | < 6 bar for > 150-600    | <40°C | >2 for < DN 80<br>>3 for > DN 100 | With sealing grooves                |
| Profiled Flat Ring | < 16 bar                 | All   | >2 for < DN 80<br>>3 for > DN 100 | With/without sealing grooves        |
| O Ring             | Minus 1 - < 16 bar       | All   |                                   | Groove dimensions see DIN standards |



**Flat Sealing**



**Flat Profile Sealing**



**O Ring Sealing**

Indication for Flange joint bolt tightening torques with elastomeric sealings

| Size<br>DN<br>mm | HDPE<br>OD<br>mm | Bolt-tightening torques ( Nm ) |                                        |                          | Standard<br>Norm |
|------------------|------------------|--------------------------------|----------------------------------------|--------------------------|------------------|
|                  |                  | Flat Sealing<br>p max < 10 bar | Flat Profile Sealing<br>p max < 16 bar | O-Ring<br>p max < 16 bar |                  |
| 15               | 20               | 15                             | 15                                     | 15                       | DVS 2210-4       |
| 20               | 25               | 15                             | 15                                     | 15                       |                  |
| 25               | 32               | 15                             | 15                                     | 15                       |                  |
| 32               | 40               | 20                             | 20                                     | 15                       |                  |
| 40               | 50               | 30                             | 30                                     | 15                       |                  |
| 50               | 63               | 35                             | 35                                     | 20                       |                  |
| 65               | 75               | 40                             | 40                                     | 25                       |                  |
| 80               | 80               | 40                             | 40                                     | 25                       |                  |
| 100              | 110              | 40                             | 40                                     | 30                       |                  |
| 100              | 125              | 40                             | 40                                     | 30                       |                  |
| 125              | 140              | 50                             | 50                                     | 35                       |                  |
| 150              | 160              | 60                             | 60                                     | 40                       |                  |
| 150              | 180              | 60                             | 60                                     | 40                       |                  |
| 200              | 200              | 70                             | 70                                     | 50                       |                  |
| 200              | 225              | 70                             | 70                                     | 50                       |                  |
| 250              | 250              | 80                             | 80                                     | 55                       |                  |
| 250              | 280              | 80                             | 80                                     | 55                       |                  |
| 300              | 315              | 100                            | 100                                    | 60                       |                  |
| 300              | 355              | 100                            | 100                                    | 60                       |                  |
| 350              | 400              | 100                            | 100                                    | 70                       |                  |
| 400              | 450              | 120                            | 120                                    | 80                       |                  |
| 500              | 560              | 190                            |                                        |                          | PES.TEC          |
| 500              | 630              | 190                            |                                        |                          |                  |
| 600              | 630              | 220                            |                                        |                          |                  |
| 700              | 710              | 220                            |                                        |                          |                  |
| 800              | 800              | 220                            |                                        |                          |                  |
| 900              | 900              | 220                            |                                        |                          |                  |
| 1000             | 1000             | 220                            |                                        |                          |                  |
| 1200             | 1200             | 220                            |                                        |                          |                  |



p max < 6 bar  
p max < 1 bar

Remarks

1. Use dedicated bolting torques of the sealing manufacturer only
2. Consider scatter differences between lower and upper bolting forces depending on the use of mechanical or impact wrench with/without torque control.