



REHAU®

Unlimited Polymer Solutions



RAUBIOXON AND RAUBIOFLEX AERATOR SYSTEMS

TECHNICAL INFORMATION

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Subject to technical modifications

Valid from September 2014

Construction

Automotive

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ADVANTAGES OF RAUBIOXON

PIPE AND DISC AERATORS

Long service life

- High tear strength
- High temperature resistance
- High elasticity
- No leaching of plasticizer
- Resistant to oil
- Resistant to ozone and ageing
- Self sealing when air supply is stopped
- No membrane hardening

**Up to 200%
longer service life**



High energy saving

- No membrane shrinkage
- Low susceptibility to biofouling
- High oxygen utilisation
- Optimum bubble size
- Small increase in pressure loss
- Sludge deposit can be removed

**Saves up to
25%***



* Based on test data from West Hornsby STP

AREAS OF APPLICATION

RAUBIOXON

1.

The RAUBIOXON pipe and disc aerator system was specially developed for fine bubble aeration of municipal and industrial wastewater in biological treatment processes.

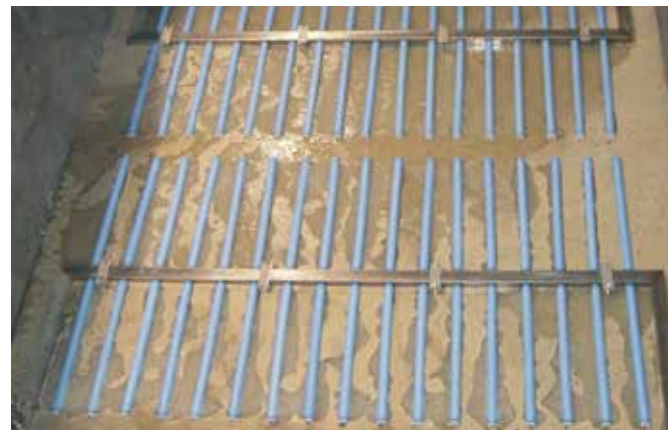
RAUSIK silicone membranes have shown to produce excellent results in the following industrial applications:

- Food industry such as production of milk, chocolate, starch and meat
- Beverage industry
- Leather processing
- Paper production
- Textile cleaning
- Vegetable oil processing

For application in wastewater containing organic solvents, strong acids or strong alkalis, please check with REHAU competence centre on its suitability.



Refurbishment with RAUBIOXON pipe aerators at Wittenberg STP (Germany), 1998



Installation of RAUBIOXON pipe aerators at SATS WWTP (Singapore), 2010



Installation of RAUBIOXON disc aerators at Tamworth WWTP (Australia), 2011

2.

MATERIALS OF RAUBIOXON

PIPE AND DISC AERATOR COMPONENTS

2.1 Pipe aerator components

2.1.1 Support pipe

D = 63 mm

D = 90 mm

Material: Polypropylene

Colour: Natural

| | | | |
|-----------------------|--------|----------------------|----------|
| Density | 0.91 | [g/cm ³] | ISO 1183 |
| Tensile strength | ≥ 23 | [N/mm ²] | ISO 527 |
| Elongation at break | ≥ 300 | [%] | ISO 527 |
| Modulus of elasticity | > 1000 | [N/mm ²] | ISO 175 |

2.1.2 Silicone membrane

d = 64 mm; s = 1.6 mm

d = 91.5 mm; s = 1.65 mm

Material: RAU-SIK silicone
Plasticiser-free, high tear strength

Colour: Blue translucent

Note: Other sizes available on request

| | | | |
|---------------------|--------|----------------------|---------------|
| Density | 1.15 | [g/cm ³] | DIN 53479 |
| Shore hardness | 60 ± 5 | [Shore A] | DIN 53505 |
| Tensile strength | ≥ 9 | [N/mm ²] | DIN 53504 SII |
| Elongation at break | ≥ 500 | [%] | DIN 53504 SII |
| Tear strength | 45 ± 5 | [N/mm] | ASTM D624 B |

2.1.3 Fastener

Material: Polyoxymethylene (POM)

Colour: Blue

| | | | |
|-----------------------|--------|----------------------|------------|
| Density | 1.41 | [g/cm ³] | ISO 1183-1 |
| Tensile strength | > 60 | [N/mm ²] | ISO 527 |
| Elongation at yield | > 10 | [%] | ISO 527 |
| Modulus of elasticity | > 2150 | [N/mm ²] | ISO 527 |

2.2 Disc aerator components

2.2.1 Base Plate

D = DN200

D = DN225

D = DN300

Connection: 3/4" NPT

Material: Polypropylene

Colour: White

| | | | |
|-----------------------|------|----------------------|-----------------|
| Density | 0.9 | [g/cm ³] | DIN EN ISO 1183 |
| Tensile strength | 24.5 | [N/mm ²] | DIN EN ISO 527 |
| Elongation at break | 180 | [%] | DIN EN ISO 527 |
| Modulus of elasticity | 1000 | [N/mm ²] | MA 17074 |

2.2.2 Disc membrane

d = 203 mm, s = 2.0 mm

d = 236 mm, s = 2.0 mm

d = 315 mm, s = 2.0 mm

Material: RAU-SIK silicone

Plasticiser-free, high tensile strength

Colour: Blue translucent

| | | | |
|---------------------|--------|----------------------|---------------|
| Density | 1.15 | [g/cm ³] | DIN 53479 |
| Hardness | 60 ± 5 | [Shore A] | DIN 53505 |
| Tensile strength | 9 | [N/mm ²] | DIN 53504 SII |
| Elongation at break | 600 | [%] | DIN 53504 SII |
| Tear strength | 45 ± 5 | [N/mm] | ASTM D624 B |

2.2.3 Retainer ring

D = DN200

D = DN225

D = DN300

Material: Polypropylene

Colour: Blue

| | | | |
|-----------------------|-----|----------------------|-------------------|
| Density | 0.9 | [g/cm ³] | DIN EN ISO 1183-A |
| Tensile strength | 24 | [N/mm ²] | DIN EN ISO 527 |
| Elongation at break | 520 | [%] | DIN EN ISO 527 |
| Modulus of elasticity | 880 | [N/mm ²] | GB 9341 |

2.2.4 Disc saddle and disc wedge saddle

Material: Polypropylene

Colour: Natural or White

| | | | |
|-----------------------|-------|----------------------|-----------|
| Density | 0.91 | [g/cm ³] | DIN 53479 |
| Tensile strength | 30 | [N/mm ²] | DIN 53455 |
| Elongation at break | ≥ 300 | [%] | DIN 53455 |
| Modulus of elasticity | 1200 | [N/mm ²] | DIN 53457 |

2.2.5 Fastener

Material: Polyoxymethylene (POM)

Colour: Blue

| | | | |
|-----------------------|--------|----------------------|------------|
| Density | 1.41 | [g/cm ³] | ISO 1183-1 |
| Tensile strength | > 60 | [N/mm ²] | ISO 527 |
| Elongation at yield | > 10 | [%] | ISO 527 |
| Modulus of elasticity | > 2150 | [N/mm ²] | ISO 527 |

2.2.6 Grommet

Material: EPDM

Colour: Black

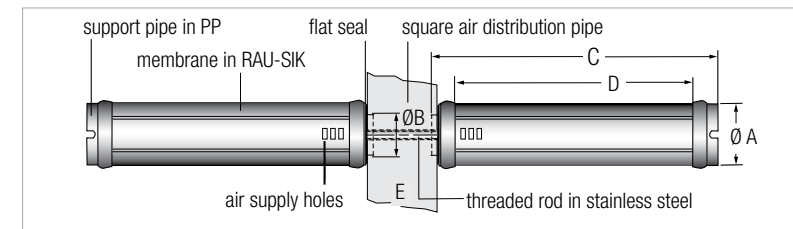
| | | | |
|------------------------------|------|----------------------|-----------|
| Density | 0.96 | [g/cm ³] | ASTM D782 |
| Hardness | 80 | [Shore A] | DIN 53505 |
| Max. application temperature | 85 | [°C] | - |

PRODUCT RANGE

RAUBIOXON PLUS DISC AERATOR

3.2 RAUBIOXON R-SERIES STD pipe aerator for square air distribution pipe

Membrane $\varnothing A = 64$ mm
 Connection hole $\varnothing B = 45$ mm
 Flat seal Silicone

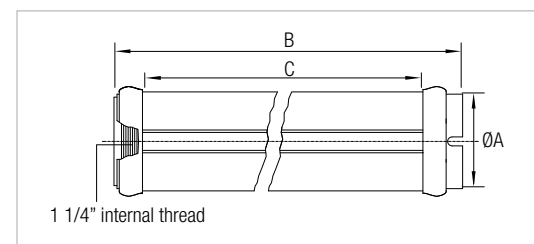


| Article no. | Membrane diameter A (mm) | Special feature(s) (See note) | Overall length C (mm) | Effective length D (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 209545-010 | 64A | - | 550 | 500 | 0.075 | 1 to 6 | 0.90 | 25 | 380x380x560/0.081 | 24 |
| 209546-010 | 64A | - | 800 | 750 | 0.113 | 1.5 to 9 | 1.20 | 25 | 380x380x810/0.117 | 32 |
| 209547-010 | 64A | - | 1050 | 1000 | 0.150 | 2 to 12 | 1.50 | 25 | 380x380x1060/0.154 | 40 |
| On request | 64A | R1 | 550 | 500 | 0.075 | 1 to 6 | 0.90 | 25 | 380x380x560/0.081 | 24 |
| On request | 64A | R1 | 800 | 750 | 0.113 | 1.5 to 9 | 1.20 | 25 | 380x380x810/0.117 | 32 |
| On request | 64A | R1 | 1050 | 1000 | 0.150 | 2 to 12 | 1.50 | 25 | 380x380x1060/0.154 | 40 |

Note: A-silicone membrane with ribs, R1-corrosion resistant up to 1g/L Chloride, non-return valve and antimicrobial (AG) version on request

3.3 RAUBIOXON R-SERIES STD pipe aerator with 1 1/4" (ISO 7-1) thread

Membrane $\varnothing A = 64$ mm
 Connection 1 1/4" internal thread (ISO 7-1)

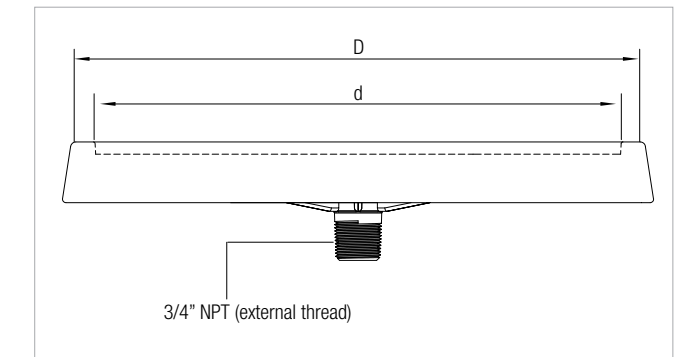


| Article no. | Membrane diameter A (mm) | Special feature(s) (See note) | Overall length B (mm) | Effective length C (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 215676-010 | 64A | T | 550 | 500 | 0.075 | 1 to 6 | 0.90 | 25 | 380x380x560/0.081 | 24 |
| 209549-010 | 64A | T | 800 | 750 | 0.113 | 1.5 to 9 | 1.20 | 25 | 380x380x810/0.117 | 32 |
| 402364-010 | 64A | T | 1050 | 1000 | 0.150 | 2 to 12 | 1.50 | 25 | 380x380x1060/0.154 | 40 |

Note: A-silicone membrane with ribs, T-1 1/4" internal thread (ISO 7-1) and antimicrobial (AG) version on request

4.1 RAUBIOXON Plus disc aerator

Connection 3/4" NPT



| Article no. | Type | Special feature(s) (See note) | Outer diameter D (mm) | Inner diameter d (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|------|-------------------------------|-----------------------|-----------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 411335-005 | 200 | - | 220 | 192 | 0.025 | 0.5 to 5 | 0.38 | 60 | 700x700x325/0.16 | 25 |
| 415215-005 | 225 | - | 254 | 225 | 0.037 | 1 to 7 | 0.46 | 48 | 705x705x265/0.132 | 25 |
| 411345-005 | 300 | - | 340 | 300 | 0.063 | 1.5 to 11 | 0.90 | 24 | 700x700x325/0.16 | 24 |
| 411355-005 | 200 | V | 220 | 192 | 0.025 | 0.5 to 5 | 0.38 | 60 | 700x700x325/0.16 | 25 |
| 415235-005 | 225 | V | 254 | 225 | 0.037 | 1 to 7 | 0.46 | 48 | 705x705x265/0.132 | 25 |
| 411365-005 | 300 | V | 340 | 300 | 0.063 | 1.5 to 11 | 0.90 | 24 | 700x700x325/0.16 | 24 |

Note: V - check valve

AREAS OF APPLICATION

RAUBIOFLEX

5.

The RAUBIOFLEX pipe and disc aerator system is developed for fine bubble aeration of municipal wastewater in biological treatment processes. Both types of aerators are suitable for continuous and intermittent operation.



6.

MATERIALS OF RAUBIOFLEX

PIPE AND DISC AERATOR COMPONENTS

6.1 Pipe aerator components

6.1.1 Support pipe

D = 63 mm

D = 90 mm

Material: Polypropylene

Colour: Natural

| | | | |
|-----------------------|--------|----------------------|----------|
| Density | 0.91 | [g/cm ³] | ISO 1183 |
| Tensile strength | ≥ 23 | [N/mm ²] | ISO 527 |
| Elongation at break | ≥ 300 | [%] | ISO 527 |
| Modulus of elasticity | > 1000 | [N/mm ²] | ISO 175 |

6.1.2 EPDM membrane

D = 64.5 mm; s = 1.7 mm

D = 92 mm; s = 1.8 mm

Material: EPDM

Colour: Black

Note: Other sizes available on request

| | | | |
|---------------------|--------|----------------------|---------------|
| Density | 1.11 | [g/cm ³] | DIN 53479 |
| Shore hardness | 50 ± 5 | [Shore A] | DIN 53505 |
| Tensile strength | ≥ 11 | [N/mm ²] | DIN 53504 SII |
| Elongation at break | ≥ 700 | [%] | DIN 53504 SII |
| Tear strength | 18 ± 2 | [N/mm] | DIN 53507 A |

6.1.3 Fastener

Material: Polyoxymethylene (POM)

Colour: Blue

| | | | |
|---------------------------|--------|----------------------|------------|
| Density | 1.41 | [g/cm ³] | ISO 1183-1 |
| Tensile strength at yield | > 60 | [N/mm ²] | ISO 527 |
| Elongation at yield | > 10 | [%] | ISO 527 |
| Modulus of elasticity | > 2150 | [N/mm ²] | ISO 527 |

6.2 Disc aerator components

6.2.1 Base Plate

D = DN200

D = DN225

D = DN300

Connection: ¾" NPT

Material: Polypropylene

Colour: White

| | | | |
|-----------------------|------|----------------------|-----------------|
| Density | 0.9 | [g/cm ³] | DIN EN ISO 1183 |
| Tensile strength | 24.5 | [N/mm ²] | DIN EN ISO 527 |
| Elongation at break | 180 | [%] | DIN EN ISO 527 |
| Modulus of elasticity | 1000 | [N/mm ²] | MA 17074 |

6.2.2 Disc membrane

d = 203 mm, s = 2.0 mm

d = 236 mm, s = 2.0 mm

d = 315 mm, s = 2.0 mm

Material: EPDM

Colour: Black

| | | | |
|---------------------|--------|----------------------|-----------|
| Density | 1.07 | [g/cm ³] | ISO 2781 |
| Hardness | 60 ± 5 | [Shore A] | DIN 53505 |
| Tensile strength | ≥ 11 | [N/mm ²] | ISO 37 |
| Elongation at break | ≥ 500 | [%] | ISO 37 |
| Tear strength | 12 ± 2 | [N/mm] | ISO 34 |

6.2.3 Retainer ring

D = DN200

D = DN225

D = DN300

Material: Polypropylene

Colour: Blue

| | | | |
|-----------------------|-----|----------------------|-------------------|
| Density | 0.9 | [g/cm ³] | DIN EN ISO 1183-A |
| Tensile strength | 24 | [N/mm ²] | DIN EN ISO 527 |
| Elongation at break | 520 | [%] | GB 1040 |
| Modulus of elasticity | 880 | [N/mm ²] | GB 9341 |

6.2.4 Disc saddle and disc wedge saddle

Material: Polypropylene
Colour: Natural or White

| | | | |
|-----------------------|-------|----------------------|-----------|
| Density | 0.91 | [g/cm ³] | DIN 53479 |
| Tensile strength | 30 | [N/mm ²] | DIN 53455 |
| Elongation at break | ≥ 300 | [%] | DIN 53455 |
| Modulus of elasticity | 1200 | [N/mm ²] | DIN 53457 |

6.2.5 Fastener

Material: Polyoxymethylene (POM)
Colour: Blue

| | | | |
|-----------------------|-------------|----------------------|------------|
| Density | 1.41 ± 0.02 | [g/cm ³] | ISO 1183-1 |
| Tensile strength | > 60 | [N/mm ²] | ISO 527 |
| Elongation at yield | > 10 | [%] | ISO 527 |
| Modulus of elasticity | > 2150 | [N/mm ²] | ISO 527 |

6.2.6 Grommet

Material: EPDM
Colour: Black

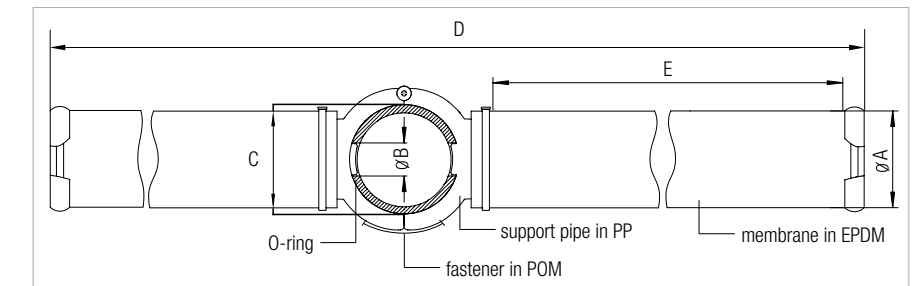
| | | | |
|------------------------------|------|----------------------|-----------|
| Density | 0.96 | [g/cm ³] | ASTM D782 |
| Hardness | 80 | [Shore A] | DIN 53505 |
| Max. application temperature | 85 | [°C] | - |

PRODUCT RANGE

RAUBIOFLEX DUO PIPE AERATOR/ STANDARD PIPE AERATOR/ PIPE AERATOR WITH 1¼" & G ¾" THREAD

7.1 RAUBIOFLEX DUO pipe aerator for round air distribution pipe

Membrane $\varnothing A = 64.5/92$ mm
Connection hole $\varnothing B = 32$ mm
O-ring EPDM



| Article no. | Membrane diameter A (mm) | Special feature(s) (See note) | Air distribution pipe diameter C (mm) | Overall length D (mm) | Effective length E (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|--------------------------|-------------------------------|---------------------------------------|-----------------------|-------------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 401665-010 | 64.5 | - | 88.9 ± 0.2 | 1200 | 2x500 | 0.150 | 2 to 12 | 1.75 | 15 | 575x765x630/0.278 | 29 |
| 401666-010 | 64.5 | - | 88.9 ± 0.2 | 1700 | 2x750 | 0.225 | 3 to 18 | 2.45 | 15 | 575x765x880/0.388 | 40 |
| 401667-010 | 64.5 | - | 88.9 ± 0.2 | 2200 | 2x1000 | 0.300 | 4 to 24 | 3.00 | 15 | 575x765x1130/0.498 | 49 |
| 404601-010 | 64.5 | S | 88.9 ± 0.2 | 670 | 1x500 | 0.075 | 1 to 6 | 0.97 | 30 | 575x765x705/0.311 | 31 |
| 404602-010 | 64.5 | S | 88.9 ± 0.2 | 920 | 1x750 | 0.113 | 1.5 to 9 | 1.32 | 30 | 575x765x955/0.421 | 43 |
| 404589-010 | 64.5 | S | 88.9 ± 0.2 | 1170 | 1x1000 | 0.150 | 2 to 12 | 1.59 | 30 | 575x765x1205/0.531 | 52 |
| 401678-010 | 64.5 | - | 90 +0.3/-0 | 1200 | 2x500 | 0.150 | 2 to 12 | 1.75 | 15 | 575x765x630/0.278 | 29 |
| 401679-010 | 64.5 | - | 90 +0.3/-0 | 1700 | 2x750 | 0.225 | 3 to 18 | 2.45 | 15 | 575x765x880/0.388 | 40 |
| 401681-010 | 64.5 | - | 90 +0.3/-0 | 2200 | 2x1000 | 0.300 | 4 to 24 | 3.00 | 15 | 575x765x1130/0.498 | 49 |
| 401801-010 | 64.5 | R | 90 +0.3/-0 | 1200 | 2x500 | 0.150 | 2 to 12 | 1.75 | 15 | 575x765x630/0.278 | 29 |
| 401804-010 | 64.5 | R | 90 +0.3/-0 | 1700 | 2x750 | 0.225 | 3 to 18 | 2.45 | 15 | 575x765x880/0.388 | 40 |
| 401805-010 | 64.5 | R | 90 +0.3/-0 | 2200 | 2x1000 | 0.300 | 4 to 24 | 3.00 | 15 | 575x765x1130/0.498 | 49 |
| 401674-010 | 64.5 | S | 90 +0.3/-0 | 670 | 1x500 | 0.075 | 1 to 6 | 0.97 | 30 | 575x765x705/0.311 | 31 |
| 401675-010 | 64.5 | S | 90 +0.3/-0 | 920 | 1x750 | 0.113 | 1.5 to 9 | 1.32 | 30 | 575x765x955/0.421 | 43 |
| 401676-010 | 64.5 | S | 90 +0.3/-0 | 1170 | 1x1000 | 0.150 | 2 to 12 | 1.59 | 30 | 575x765x1205/0.531 | 52 |
| 401686-010 | 64.5 | - | 110 +0.4/-0 | 1220 | 2x500 | 0.150 | 2 to 12 | 1.80 | 14 | 575x765x630/0.278 | 28 |
| 401687-010 | 64.5 | - | 110 +0.4/-0 | 1720 | 2x750 | 0.225 | 3 to 18 | 2.50 | 14 | 575x765x880/0.388 | 38 |
| 401688-010 | 64.5 | - | 110 +0.4/-0 | 2220 | 2x1000 | 0.300 | 4 to 24 | 3.05 | 14 | 575x765x1130/0.498 | 47 |
| On request | 64.5 | R | 110 +0.4/-0 | 1220 | 2x500 | 0.150 | 2 to 12 | 1.80 | 14 | 575x765x630/0.278 | 28 |
| On request | 64.5 | R | 110 +0.4/-0 | 1720 | 2x750 | 0.225 | 3 to 18 | 2.50 | 14 | 575x765x880/0.388 | 38 |
| 404591-010 | 64.5 | R | 110 +0.4/-0 | 2220 | 2x1000 | 0.300 | 4 to 24 | 3.05 | 14 | 575x765x1130/0.498 | 47 |
| On request | 64.5 | S | 110 +0.4/-0 | 680 | 1x500 | 0.075 | 1 to 6 | 0.99 | 28 | 575x765x705/0.311 | 30 |
| 401808-010 | 64.5 | S | 110 +0.4/-0 | 930 | 1x750 | 0.113 | 1.5 to 9 | 1.34 | 28 | 575x765x955/0.421 | 41 |
| 401809-010 | 64.5 | S | 110 +0.4/-0 | 1180 | 1x1000 | 0.150 | 2 to 12 | 1.62 | 28 | 575x765x1205/0.531 | 49 |

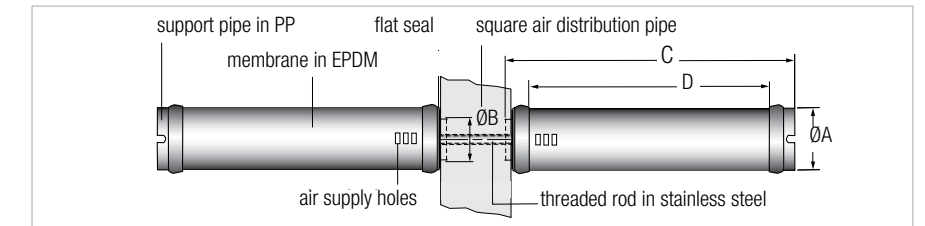
Note: R1-corrosion resistant up to 1g/L Chloride, R-corrosion resistant up to 5g/L Chloride, S-pipe aerator on one side, non-return valve, saddle size Ø168.3 and Ø219.1 for Ø92 membrane on request.

| Article no. | Membrane diameter A (mm) | Special feature(s) (See note) | Air distribution pipe diameter C (mm) | Overall length D (mm) | Effective length E (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|--------------------------|-------------------------------|---------------------------------------|-----------------------|-------------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 401697-010 | 64.5 | - | 114.3 ± 0.23 | 1220 | 2x500 | 0.150 | 2 to 12 | 1.80 | 14 | 575x765x630/0.278 | 28 |
| 401698-010 | 64.5 | - | 114.3 ± 0.23 | 1720 | 2x750 | 0.225 | 3 to 18 | 2.50 | 14 | 575x765x880/0.388 | 38 |
| 401699-010 | 64.5 | - | 114.3 ± 0.23 | 2220 | 2x1000 | 0.300 | 4 to 24 | 3.05 | 14 | 575x765x1130/0.498 | 47 |
| 401694-010 | 64.5 | S | 114.3 ± 0.23 | 680 | 1x500 | 0.075 | 1 to 6 | 0.99 | 28 | 575x765x705/0.311 | 30 |
| 401716-010 | 64.5 | S | 114.3 ± 0.23 | 930 | 1x750 | 0.113 | 1.5 to 9 | 1.34 | 28 | 575x765x955/0.421 | 41 |
| 401696-010 | 64.5 | S | 114.3 ± 0.23 | 1180 | 1x1000 | 0.150 | 2 to 12 | 1.62 | 28 | 575x765x1205/0.531 | 49 |
| On request | 92 | - | 110 +0.4/-0 | 1220 | 2x500 | 0.238 | 3 to 19 | 2.67 | 14 | 575x765x630/0.278 | 40 |
| On request | 92 | - | 110 +0.4/-0 | 1720 | 2x750 | 0.357 | 4.5 to 28.5 | 3.62 | 14 | 575x765x880/0.388 | 54 |
| 404595-010 | 92 | - | 110 +0.4/-0 | 2220 | 2x1000 | 0.476 | 6 to 38 | 4.72 | 14 | 575x765x1130/0.498 | 70 |
| On request | 92 | R1 | 110 +0.4/-0 | 1220 | 2x500 | 0.238 | 3 to 19 | 2.67 | 14 | 575x765x630/0.278 | 40 |
| On request | 92 | R1 | 110 +0.4/-0 | 1720 | 2x750 | 0.357 | 4.5 to 28.5 | 3.62 | 14 | 575x765x880/0.388 | 54 |
| On request | 92 | R1 | 110 +0.4/-0 | 2220 | 2x1000 | 0.476 | 6 to 38 | 4.72 | 14 | 575x765x1130/0.498 | 70 |
| On request | 92 | R | 110 +0.4/-0 | 1220 | 2x500 | 0.238 | 3 to 19 | 2.67 | 14 | 575x765x630/0.278 | 40 |
| On request | 92 | R | 110 +0.4/-0 | 1720 | 2x750 | 0.357 | 4.5 to 28.5 | 3.62 | 14 | 575x765x880/0.388 | 54 |
| On request | 92 | R | 110 +0.4/-0 | 2220 | 2x1000 | 0.476 | 6 to 38 | 4.72 | 14 | 575x765x1130/0.498 | 70 |
| On request | 92 | S | 110 +0.4/-0 | 680 | 1x500 | 0.119 | 1.5 to 9.5 | 1.43 | 28 | 575x765x630/0.278 | 42 |
| On request | 92 | S | 110 +0.4/-0 | 930 | 1x750 | 0.179 | 2.25 to 14.25 | 1.90 | 28 | 575x765x880/0.388 | 57 |
| 404596-010 | 92 | S | 110 +0.4/-0 | 1180 | 1x1000 | 0.238 | 3 to 19 | 2.45 | 28 | 575x765x1130/0.498 | 73 |
| On request | 92 | - | 114.3 ± 0.23 | 1220 | 2x500 | 0.238 | 3 to 19 | 2.67 | 14 | 575x765x630/0.278 | 40 |
| On request | 92 | - | 114.3 ± 0.23 | 1720 | 2x750 | 0.357 | 4.5 to 28.5 | 3.62 | 14 | 575x765x880/0.388 | 54 |
| 404593-010 | 92 | - | 114.3 ± 0.23 | 2220 | 2x1000 | 0.476 | 6 to 38 | 4.72 | 14 | 575x765x1130/0.498 | 70 |
| 406049-010 | 92 | L | 114.3 ± 0.23 | 2228 | 2x1000 | 0.476 | 6 to 38 | 4.72 | 14 | 575x765x1130/0.498 | 70 |
| 404722-010 | 92 | L | 168.3 ± 0.28 | 2282 | 2x1000 | 0.476 | 6 to 38 | 4.81 | 10 | 540x520x1290/0.362 | 53 |
| 404723-010 | 92 | L | 219.1 ± 0.38 | 2332 | 2x1000 | 0.476 | 6 to 38 | 4.89 | 10 | 540x520x1290/0.362 | 55 |

Note: L-low back pressure, R1-corrosion resistant up to 1g/L Chloride, R-corrosion resistant up to 5g/L Chloride, S-pipe aerator on one side, non-return valve, saddle size Ø168.3 and Ø219.1 for Ø92 membrane on request.

7.2 RAUBIOFLEX STD pipe aerator for square air distribution pipe

Membrane Ø A = 64.5 mm
 Connection hole Ø B = 45 mm
 Flat seal EPDM

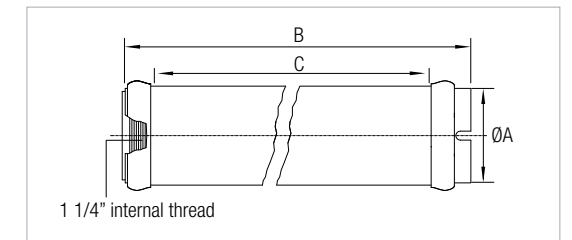


| Article no. | Membrane diameter A (mm) | Special feature(s) (See note) | Overall length C (mm) | Effective length D (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 401447-010 | 64.5 | - | 550 | 500 | 0.075 | 1 to 6 | 0.90 | 25 | 380x380x560/0.081 | 24 |
| 404586-010 | 64.5 | - | 800 | 750 | 0.113 | 1.5 to 9 | 1.20 | 25 | 380x380x810/0.117 | 32 |
| 401453-010 | 64.5 | - | 1050 | 1000 | 0.150 | 2 to 12 | 1.50 | 25 | 380x380x1060/0.154 | 40 |

Note: non-return/check valve on request

7.3 RAUBIOFLEX STD pipe aerator with 1 1/4" (ISO 7-1) and NPT 3/4" thread

Membrane Ø A = 64.5 mm
 Connection 1 1/4" (ISO 7-1) / NPT 3/4"



| Article no. | Membrane diameter A (mm) | Special feature(s) (See note) | Overall length B (mm) | Effective length C (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 401457-010 | 64.5 | T | 550 | 500 | 0.075 | 1 to 6 | 0.90 | 25 | 380x380x560/0.081 | 24 |
| 403458-010 | 64.5 | T | 800 | 750 | 0.113 | 1.5 to 9 | 1.20 | 25 | 380x380x810/0.117 | 32 |
| 401463-010 | 64.5 | T | 1050 | 1000 | 0.150 | 2 to 12 | 1.50 | 25 | 380x380x1060/0.154 | 40 |
| 404731-010 | 64.5 | T1 | 550 | 500 | 0.086 | 1 to 15 | 0.90 | 25 | 380x380x560/0.081 | 24 |

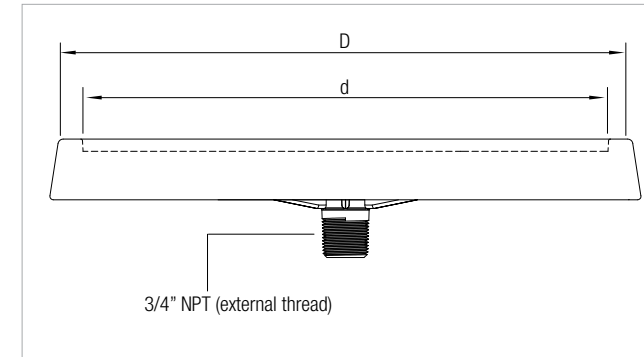
Note: T-1 1/4" internal thread (ISO 7-1), T1-NPT 3/4"

PRODUCT RANGE

RAUBIOFLEX DISC AERATOR

8.

8.1 RAUBIOFLEX disc aerator



Connection 3/4" NPT

| Article no. | Type | Special feature(s) (See note) | Outer diameter D (mm) | Inner diameter d (mm) | Perforated area (m ²) | Airflow range (Nm ³ /hr) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|------|----------------------------------|-----------------------|-----------------------|-----------------------------------|-------------------------------------|------------------|-------------------------|--|------------------------------|
| 851608-005 | 200 | - | 220 | 192 | 0.025 | 0.5 to 5 | 0.38 | 60 | 700x700x325/0.16 | 25 |
| 851688-005 | 225 | - | 254 | 225 | 0.037 | 1 to 7 | 0.46 | 48 | 700x700x325/0.16 | 24 |
| 851618-005 | 300 | - | 340 | 300 | 0.063 | 1.5 to 11 | 0.90 | 24 | 700x700x325/0.16 | 24 |
| 851628-005 | 200 | V | 220 | 192 | 0.025 | 0.5 to 5 | 0.38 | 60 | 700x700x325/0.16 | 25 |
| 851708-005 | 225 | V | 254 | 225 | 0.037 | 1 to 7 | 0.46 | 48 | 700x700x325/0.16 | 24 |
| 851638-005 | 300 | V | 340 | 300 | 0.063 | 1.5 to 11 | 0.90 | 24 | 700x700x325/0.16 | 24 |

Note: V-check valve

AERATOR CONSUMABLES AND ACCESSORIES

9.

9.1 Pipe aerator consumables

9.1.1 Membranes for pipe aerator

Depending on the type of pipe aerator, the following membranes will be required:



Pipe membrane

| Article no. | Membrane for Aerator | Membrane diameter (mm) | Overall length (mm) | Effective length (mm) | Perforated area (m ²) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|--|------------------------|---------------------|-----------------------|-----------------------------------|------------------|-------------------------|--|------------------------------|
| 800164-006 | RAUBIOXON R SERIES STD | 64A | 560 | 500 | 0.075 | 0.22 | 50 | 350x575x113/0.023 | 12 |
| 800169-006 | RAUBIOXON R SERIES STD | 64A | 810 | 750 | 0.113 | 0.33 | 50 | 350x825x113/0.033 | 17 |
| 800175-006 | RAUBIOXON R SERIES STD | 64A | 1060 | 1000 | 0.150 | 0.44 | 50 | 350x1075x113/0.043 | 23 |
| 800159-006 | RAUBIOXON R SERIES DUO | 64A | 545 | 500 | 0.075 | 0.22 | 50 | 350x575x113/0.023 | 12 |
| 800168-006 | RAUBIOXON R SERIES DUO | 64A | 795 | 750 | 0.113 | 0.33 | 50 | 350x825x113/0.033 | 17 |
| 800174-006 | RAUBIOXON R SERIES DUO | 64A | 1045 | 1000 | 0.150 | 0.44 | 50 | 350x1075x113/0.043 | 23 |
| 800176-006 | RAUBIOXON R SERIES DUO | 91.5A | 545 | 500 | 0.119 | 0.29 | 50 | 180x575x350/0.037 | 15 |
| 800177-006 | RAUBIOXON R SERIES DUO | 91.5A | 795 | 750 | 0.179 | 0.44 | 50 | 180x825x350/0.052 | 23 |
| 800178-006 | RAUBIOXON R SERIES DUO | 91.5A | 1045 | 1000 | 0.238 | 0.57 | 50 | 180x1075x350/0.068 | 30 |
| 851118-006 | RAUBIOFLEX STD (FOR ALL EXCEPT T1-G3/4") | 64.5 | 560 | 500 | 0.075 | 0.23 | 50 | 350x575x113/0.023 | 12 |
| 800276-006 | RAUBIOFLEX STD (FOR T1-G3/4") | 64.5 | 560 | 500 | 0.075 | 0.23 | 50 | 350x575x113/0.023 | 12 |
| 851128-006 | RAUBIOFLEX STD | 64.5 | 810 | 750 | 0.113 | 0.33 | 50 | 350x825x113/0.033 | 17 |
| 851138-006 | RAUBIOFLEX STD | 64.5 | 1060 | 1000 | 0.150 | 0.44 | 50 | 350x1075x113/0.043 | 23 |
| 800269-006 | RAUBIOFLEX DUO | 64.5 | 545 | 500 | 0.075 | 0.23 | 50 | 350x575x113/0.023 | 12 |
| 851218-006 | RAUBIOFLEX DUO | 64.5 | 795 | 750 | 0.113 | 0.33 | 50 | 350x825x113/0.033 | 17 |
| 851228-006 | RAUBIOFLEX DUO | 64.5 | 1045 | 1000 | 0.150 | 0.44 | 50 | 350x1075x105/0.04 | 23 |
| 800274-006 | RAUBIOFLEX DUO | 92 | 545 | 500 | 0.119 | 0.35 | 50 | 180x575x350/0.037 | 18 |
| 851225-006 | RAUBIOFLEX DUO | 92 | 795 | 750 | 0.179 | 0.51 | 50 | 180x825x350/0.052 | 27 |
| 851235-006 | RAUBIOFLEX DUO | 92 | 1045 | 1000 | 0.238 | 0.67 | 50 | 180x1075x350/0.068 | 35 |

A-silicone membrane with ribs, DUO-saddle type pipe aerator, STD-standard pipe aerator, T1-G3/4" threaded variation of STD

9.1.2 Single ear clamp for pipe aerator

Stainless steel single ear clamp is used to secure the tube membrane onto the pipe aerator's support pipe. For each tube membrane, two single ear clamps are needed. Depending on the type of pipe aerator, the following single ear clamps will be required:

| Article no. | Material | Pipe aerator type |
|-------------|----------|-------------------|
| 240452 | SS 304 | 64 mm |
| 233675 | SS 316 | 64 mm |
| 353266 | SS 304 | 92 mm |
| 414849 | SS 316 | 92 mm |

SS304 – suitable for up to 200mg/L Chloride
SS316 – suitable for up to 1g/L Chloride



One-ear clamp

9.1.3 Fastener for DUO

Fastener is used to secure the DUO saddle onto the round air distribution pipe. For each DUO saddle, one fastener will be required.

| Article no. | Saddle size | DUO pipe aerator type |
|-------------|----------------------|-----------------------|
| 351726 | 88.9, 90, 110, 114.3 | 64 mm |
| 351726 | 110, 114.3 | 92 mm |
| 313179 | *114.3, 168.3, 219.1 | 92 mm |

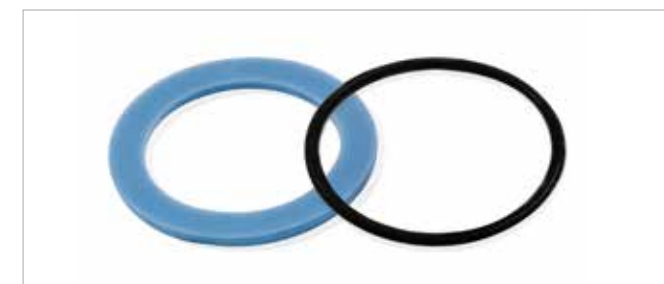
* for pipe aerator with L feature



Fastener

9.1.4 Flat seal/O-ring for pipe aerator

Rubber flat seals and O-rings are needed to seal the connection gap between the aerator and air distribution pipe. Two O-rings are needed for each DUO pipe aerator, and one flat seal is needed for each STD pipe aerator. Rubber flat seals and O-rings must be replaced before removed aerators are reinstalled onto the air distribution pipe during maintenance. Depending on the type of pipe aerator, the following flat seals/O-rings will be required:



Flat seal and O-ring

| Article no. | Material | Pipe aerator type | With DUO saddle size |
|-------------|-----------------------|-------------------|----------------------|
| 351728 | EPDM O-ring 60x4 | DUO/64mm | 110, 114.3 |
| 351727 | EPDM O-ring 62x4 | DUO/64mm | 88.9, 90 |
| 304359 | EPDM O-ring 91x4 | DUO/92mm | 110, 114.3 |
| 400507 | *Silicone O-ring 61x4 | DUO/64mm | 88.9, 90, 110, 114.3 |
| 224704 | Silicone flat seal | STD/64mm | N.A |
| 235869 | EPDM flat seal | STD/64mm | N.A |

* To be used only with pipe aerator having the high temperature resistant (H) feature

9.2 Pipe aerator accessories

9.2.1 Adaptor for square air distribution pipes

Adaptor ring is to be added onto each STD pipe aerator to ensure that the connection to the air distribution pipe is tight, if the diameter of the opening on the square air distribution pipe is not 45mm. Each adaptor ring comes with a flat EPDM seal (article no. 284449). Depending on the size of the opening, the following adaptors will be required:

| Article no. | Material | Size of opening (mm) |
|-------------|----------|----------------------|
| 284550 | PVC | 35 |
| 224377 | PP | 40 |
| On request | PVC | 50 |
| On request | PVC | 55 |

The length of the threaded rod has to be increased by about 20mm when a pair of adaptors is used.



Adaptor ring

9.2.2 Adaptor for round air distribution pipes

Polypropylene (PP) adaptor with EPDM seal will be required to connect the STD pipe aerator to round air distribution pipe. Two PP adaptors are needed when connecting a pair of STD pipe aerators via SS threaded rod. The round air distribution pipe has to be rated PN16 or equivalent to resist the compressive stresses induced by the pair of installed aerators. Depending on the size of the air distribution pipe, the following PP adaptors will be required:

| Article no. | Pipe outer diameter (OD) |
|-------------|--------------------------|
| 233511 | 88.9/90 |
| 233521 | 110/114.3 |
| 235936 | 140/141.3 |
| 235946 | 160/168.3 |



PP adaptor for round pipes

9.2.3 Stainless steel rod

STD pipe aerators can be easily installed in pairs via M10 stainless steel threaded rods. For each pair of STD pipe aerators, one M10 stainless steel threaded rod is needed. Depending on the size of the air distribution pipe, the following rods will be required:

| Article no. | Threaded rod length (mm) | For air distribution pipes |
|-------------|--------------------------|----------------------------|
| 314420 | 205 | 80 x 80 x 2 |
| 302503 | 225 | 100 x 100 x 3 |
| 314466 | 245 | 120 x 120 x 3 |
| 279908 | 250 | DN80 (OD90) |
| 350162 | 270 | DN100 (OD110) |
| on request | 300 | DN125 (OD140) |
| on request | 320 | DN150 (OD160) |



Stainless steel rod

9.2.4 End Cap

When using M10 stainless steel threaded rod connection, end cap made from PP (article no. 291858) can be used in place of a STD pipe aerator should there be a need to install the STD pipe aerator on only one side of the air distribution pipe.



End cap

9.3 Tools for pipe aerator

9.3.1 Installation adaptor for STD pipe aerator

Installation adaptor made from stainless steel (article no. 248287) will be required for the installation of STD pipe aerator using threaded rod connection.



Installation adaptor

9.3.2 Hand pliers for one-ear clamp installation and removal

Hand pliers (article no. 248217) will be required for the installation and removal of pipe aerator's one ear clamp.



Hand pliers

9.4 Disc aerator consumables

9.4.1 Membranes for disc aerator

Depending on the type of disc aerator, the following membranes will be required:



Disc membrane

| Article no. | Membrane for Aerator | Type | Outer diameter (mm) | Perforated area (m ²) | Unit weight (kg) | Make-up per carton (pc) | Carton size /volume (mm/m ³) | Gross weight per carton (kg) |
|-------------|----------------------|------|---------------------|-----------------------------------|------------------|-------------------------|--|------------------------------|
| 850228-006 | RAUBIOXON PLUS DISC | 200 | 203 | 0.025 | 0.100 | 50 | 550x550x260/0.079 | 5.8 |
| 850368-006 | RAUBIOXON PLUS DISC | 225 | 236 | 0.037 | 0.127 | 50 | 550x560x260/0.81 | 7.3 |
| 850238-006 | RAUBIOXON PLUS DISC | 300 | 315 | 0.063 | 0.250 | 50 | 600x400x260/0.063 | 13.5 |
| 851648-006 | RAUBIOFLEX DISC | 200 | 203 | 0.025 | 0.100 | 50 | 550x550x260/0.079 | 5.8 |
| 851728-006 | RAUBIOFLEX DISC | 225 | 236 | 0.037 | 0.127 | 50 | 550x560x260/0.081 | 7.3 |
| 851658-006 | RAUBIOFLEX DISC | 300 | 315 | 0.063 | 0.250 | 50 | 600x400x260/0.063 | 13.5 |

9.4.2 Retainer ring

Retainer ring will be needed to secure the disc membrane onto the disc aerator's base plate. Depending on the size of disc aerator, the following retainer rings will be required.



Retainer ring

| Article no. | Type | Outer diameter (mm) | Height (mm) | Weight (kg) |
|-------------|------|---------------------|-------------|-------------|
| 351139 | 200 | 220 | 28 | 0.08 |
| 354839 | 225 | 225 | 30 | 0.10 |
| 351141 | 300 | 340 | 35 | 0.20 |

9.4.3 Fastener for disc saddle

Fastener (article no. 351726) is used to secure the disc saddle onto the round air distribution pipe. For each disc saddle, one fastener will be required.



Fastener

9.4.4 O-ring for disc saddle

O-rings are needed to seal the connection gap between the aerator and air distribution pipe. Two O-rings are needed for each disc saddle and they must be replaced with new ones if the disc saddle is to be removed and reinstalled onto the air distribution pipe during maintenance. Depending on the size of disc saddle, the following O-rings will be required:

| Article no. | Description | For disc saddle size |
|-------------|------------------|----------------------|
| 351728 | EPDM O-ring 60x4 | 110, 114.3 |
| 351727 | EPDM O-ring 62x4 | 88.9, 90 |



O-ring

9.5 Disc aerator accessories

9.5.1 Disc saddle for round pipe

Disc saddle can be used to connect the disc aerator to the round air distribution pipe. Depending on the size of air distribution pipe, the following disc saddles will be required:

| Article no. | Air distribution pipe diameter (mm) | Weight (kg) |
|-------------|-------------------------------------|-------------|
| 417081 | 88.9 ± 0.2 | 0.18 |
| 417003 | 90 +0.3/-0 | 0.18 |
| 417005 | 110 +0.4/-0 | 0.21 |
| 417111 | 114.3 ± 0.23 | 0.21 |



Disc saddle

9.5.2 Disc wedge saddle for round pipe

Disc wedge saddle can be used to connect the disc aerator to the round air distribution pipe. Depending on the size of air distribution pipe, the following disc wedge saddles will be required:

| Article no. | Air distribution pipe diameter (mm) | Weight (kg) |
|-------------|-------------------------------------|-------------|
| 404712 | 63 +0.2/-0 | 0.09 |
| 404713 | 90 +0.3/-0 | 0.19 |



Disc wedge saddle

9.5.3 Grommet for round pipe

Grommet can be used to connect the disc aerator to the round air distribution pipe. Depending on the size and wall thickness of the air distribution pipe, the following grommets will be required:

| Article no. | PVC outer diameter (mm) | Required wall thickness (mm) | Weight (kg) |
|-------------|-------------------------|------------------------------|-------------|
| 351628 | Ø88.9/Ø90 | 3.9-4.4 | 0.02 |
| 351629 | Ø88.9/Ø90 | 6.4-6.9 | 0.02 |
| 351087 | Ø110/Ø114.3 | 4.2-4.7 | 0.02 |
| 351086 | Ø110/Ø114.3 | 6.5-7.0 | 0.02 |



Grommet

9.6 Tools for disc aerator

9.6.1 Assembly tool for disc aerator

Disc aerator assembly tool (article no. 400535) will be required to secure disc membrane onto the base plate with a retainer ring.



Disc aerator assembly tool

9.6.2 Retainer ring removal tool

Retainer ring removal tool will be needed to remove the retainer ring from the disc aerator's base plate. Removed retainer rings should not be reused. Depending on the size of retainer ring, the following retainer ring removal tools will be required:

| Article no. | Description |
|-------------|------------------------------------|
| 400515 | Retainer ring 200/225 removal tool |
| 400525 | Retainer ring 300 removal tool |



Retainer ring removal tool

9.7 Air distribution pipe and pipe clamps

9.7.1 Air distribution pipe (air lateral pipe)

There are generally two categories of air distribution pipes, namely square stainless steel pipe and round stainless steel/polymer pipe.

The air distribution pipe is usually mounted with its centre at a distance of 200 to 300mm above the tank floor. Depending on the type and size of air distribution pipe, the following aerators/connections may be used:

| Types of air distribution pipe | *Air distribution pipe size | Types of aerator and connection |
|---------------------------------------|--------------------------------|--|
| Round SS pipe | OD88.9, OD114.3 | STD pipe aerator with PP adaptor, DUO pipe aerator, disc aerator using saddle connection |
| | OD141.3, OD168.3 | **STD pipe aerator with PP adaptor |
| | OD168.3, OD219.1 | DUO pipe aerator |
| Round polymer pipe | OD88.9, OD90, OD110, OD114.3 | STD pipe aerator with PP adaptor, DUO pipe aerator, disc aerator using saddle connection, ***disc aerator using grommet connection |
| | OD140, OD141.3, OD160, OD168.3 | **STD pipe aerator with PP adaptor |
| | OD168.3, OD219.1 | DUO pipe aerator |
| Square SS pipe | 80x80, 100x100, 120x120 | STD pipe aerator |
| Pipe with top 3/4" NPT socket | - | Disc aerator |
| Pipe with side 3/4" NPT nipple | - | STD pipe aerator with NPT 3/4" thread |
| Pipe with 1 1/4" (ISO7-1) male nipple | - | STD pipe aerator with 1 1/4" (ISO7-1) thread |

* Air distribution pipe pressure should be rated at least PN10 or equivalent unless otherwise stated.

** Pressure rating of PN16 or equivalent required for air distribution pipe

*** Air distribution pipe wall thickness has to be within the grommet's recommended range (See 9.5.2)

9.7.1.1 Square air distribution pipe

Material: SS304 (standard) or higher grade



RAUBIOXON R SERIES STD pipe aerators installed on SS square pipe

9.7.1.2 Round air distribution pipe

Material: UPVC, ABS, SS304 (standard) or higher grade



RAUBIOXON R SERIES DUO pipe aerators installed on uPVC round pipe using PP adaptors

9.7.2 Stainless steel pipe clamp

When pipes are used as air distribution pipe, they have to be secured to the tank base via stainless steel clamps made from SS304 or higher grade. Depending on the size of air distribution pipe, the following pipe clamps will be required:

| Article no. | DN / pipe outer diameter |
|-------------|--------------------------|
| 236704 | 80/90 |
| 236714 | 100/110 |



Stainless steel pipe clamp

10. DESIGN OF AERATOR SYSTEM

10.1 Design of aerator system

10.1.1 General

The purpose of aerator system design is to supply the required amount of oxygen into the wastewater under a given set of conditions in the most economical way by taking into consideration both the investment and operating cost.

The design is based on characteristic values for the aeration of clean water under standard conditions (101.3kPa, 20°C). The characteristic values are adjusted on the basis of calculated and empirically determined factors to reflect actual conditions. Factors that need to be considered include wastewater temperature, atmospheric pressure (which affects the oxygen saturation concentration), increased concentrations of dissolved salts or surface active substances (surfactants), wastewater flow direction, and the positions and extents of non-aerated zones.

The graphs for standard oxygen transfer efficiency (SOTE) are derived from aerator performance tests which are done in test tank with clean water under standard conditions with uniform aerator layout (results from aerator performance tests have a tolerance of +/-10%). REHAU aerators' SOTE as well as pressure loss graphs can be found in sections 10.1.3 and 10.1.5.

The specific airflow rate range and recommended design specific airflow rate of the aerators are as follows:

| Type of aerator | Specific airflow rate range | Recommended design specific airflow rate range | * Max specific airflow rate |
|---|------------------------------|--|-----------------------------|
| 64mm pipe aerator (except type RAUBIOFLEX STD 64-T1-500-P1) | 2 to 12 Nm ³ /h.m | 4 to 10 Nm ³ /h.m | 20 Nm ³ /h.m |
| RAUBIOFLEX STD 64-T1-500-P1) | 1 to 15 Nm ³ /h | 2 to 9 Nm ³ /h | 18 Nm ³ /h |
| 92mm pipe aerator | 3 to 19 Nm ³ /h.m | 6 to 16 Nm ³ /h.m | 32 Nm ³ /h.m |
| Disc aerator 200 | 0.5 to 5 Nm ³ /h | 1.5 to 3.5 Nm ³ /h.m | 7 Nm ³ /h |
| Disc aerator 225 | 1 to 7 Nm ³ /h | 2 to 5 Nm ³ /h | 10 Nm ³ /h |
| Disc aerator 300 | 1.5 to 11 Nm ³ /h | 4 to 8 Nm ³ /h | 16 Nm ³ /h |

The minimum airflow of the aerator should be within the recommended airflow range and the selected airflow supply has to be sufficient for activated sludge mixing purpose. A typical mixing rate is approximately 0.01 m³ air / m³ wastewater-minute.

Please provide our Technical Applications Department with details of your particular requirements using the form provided in Section 11, which lists the design parameter inputs needed for sizing.

10.1.2 Arrangement of pipe aerator

Pipe aerators installed on the same air distribution pipe are commonly spaced between 250mm and 1000mm. Air distribution pipes with pipe aerators installed are normally spaced between 3000mm and 4000mm. Maintenance access requirement has to be considered when arranging the pipe aerators' layout. At least 600mm of clear distance between 2 adjacent air distribution pipe grids is recommended.

10.1.2.1 Impact of mixers and recirculation pumps on pipe aerator arrangement

If mixers or recirculation pumps are used in aeration tanks, the resultant wastewater currents may produce adverse pipe aerator oscillation. The connection between the pipe aerator and air distribution pipe may loosen over time due to this oscillation. To minimize the possibility of connection loosening, the air distribution pipe grid has to be arranged such that the wastewater flows in the direction of the pipe aerator's longitudinal axis (Figure 10-1).

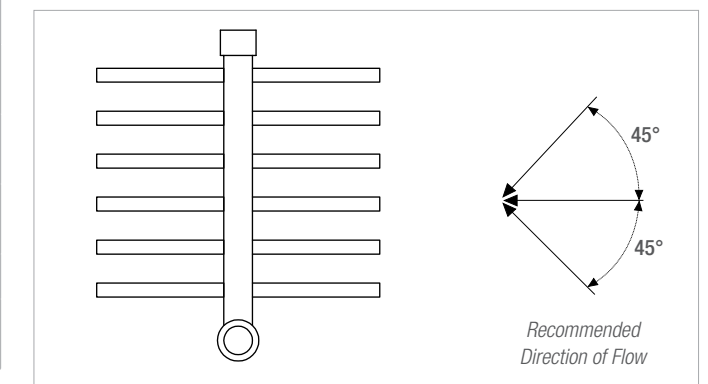


Figure 10-1: Arrangement of pipe aerator with consideration of flow direction.

* Max airflow is used only during maintenance with a duration limit of 5 minutes per day.

In addition, adequate distance must be allowed between mixers or recirculation pumps and pipe aerators. The wastewater flow velocity should be 0.3m/s or less at installation locations (Figure 10-2). A flow velocity of between 0.3 and 0.9m/s will require pipe aerator fixation (Figure 10-3). Pipe aerator should not be installed at locations where flow velocity is above 0.9m/s.

As a rough guide, the clearance distance of mixer to aerator may be 2.5 times the mixer's impeller diameter or more. If adequate clearance is not possible, pipe aerator fixation may be required. Whenever possible, customer should seek the respective mixer or pump supplier's advice on the possible flow velocity induced by their product.

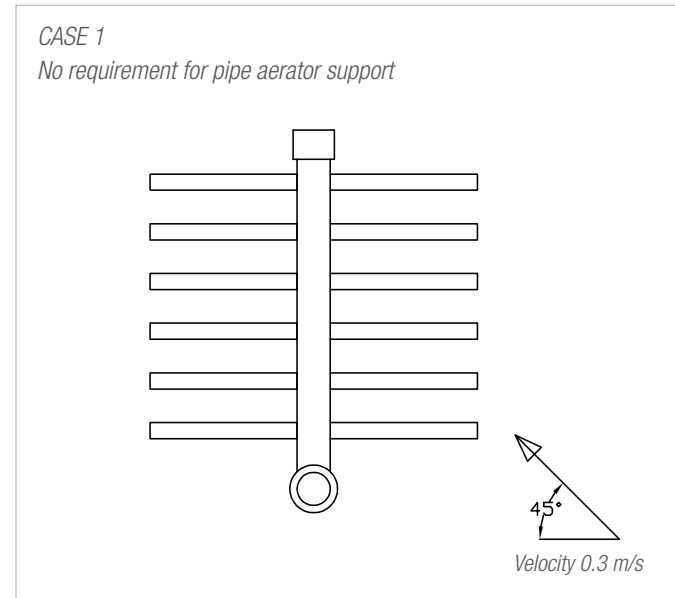


Figure 10-2: No requirement for pipe aerator support when velocity is less than 0.3 m/s.

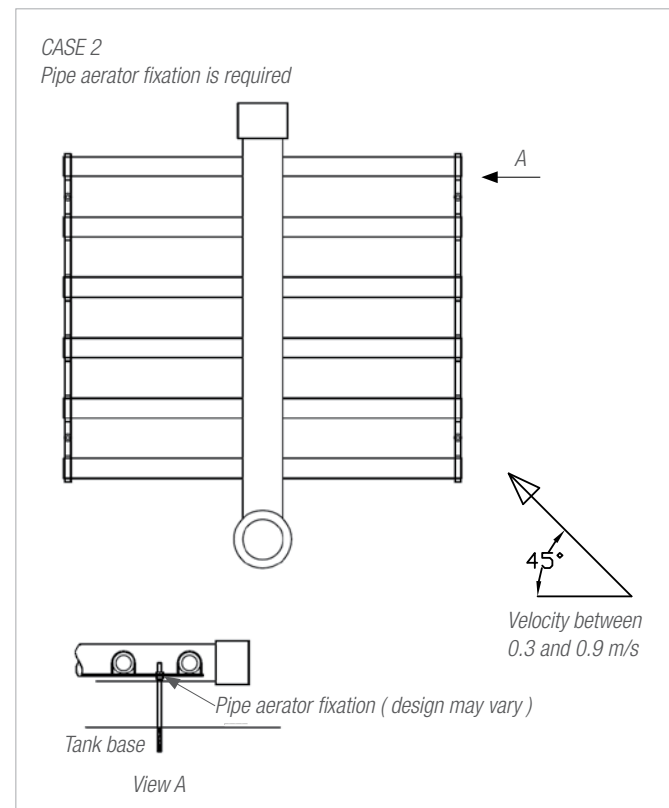


Figure 10-3: Pipe aerator support is required when velocity is between 0.3 m/s and 0.9 m/s.

10.1.3 Pipe aerator SOTE and pressure loss

10.1.3.1 RAUBIOXON R SERIES pipe aerator

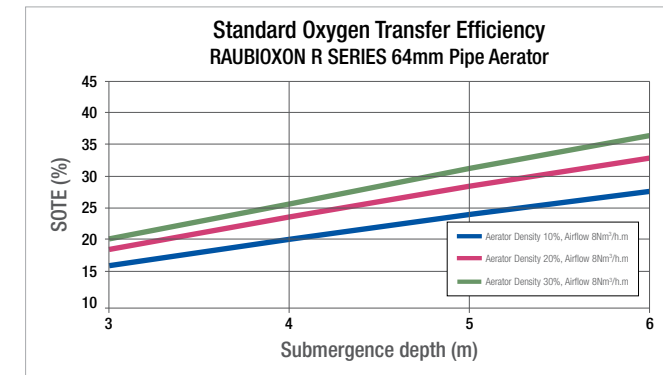


Figure 10-4: SOTE for RAUBIOXON R SERIES STD and DUO Ø64mm pipe aerator

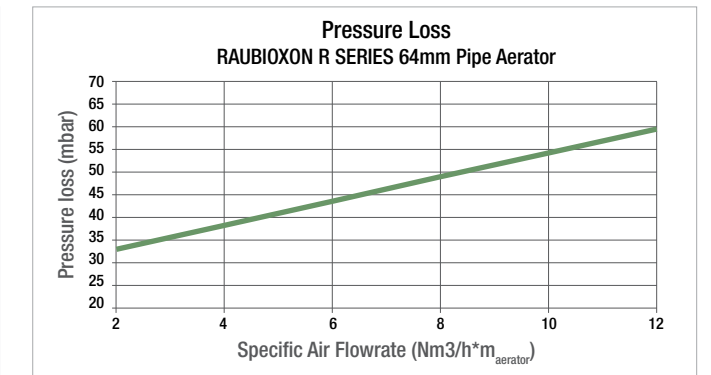


Figure 10-5: Pressure loss for RAUBIOXON R SERIES STD and DUO Ø64mm pipe aerator (without non-return valve)

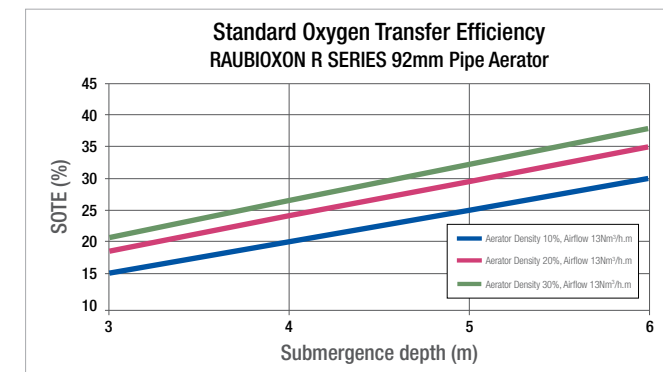


Figure 10-6: SOTE for RAUBIOXON R SERIES DUO Ø92mm pipe aerator

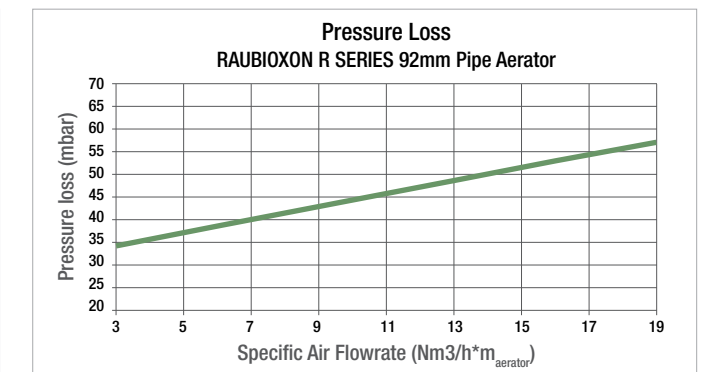


Figure 10-7: Pressure loss for RAUBIOXON R SERIES DUO Ø92mm pipe aerator (without non-return valve)

10.1.3.2 RAUBIOFLEX pipe aerator

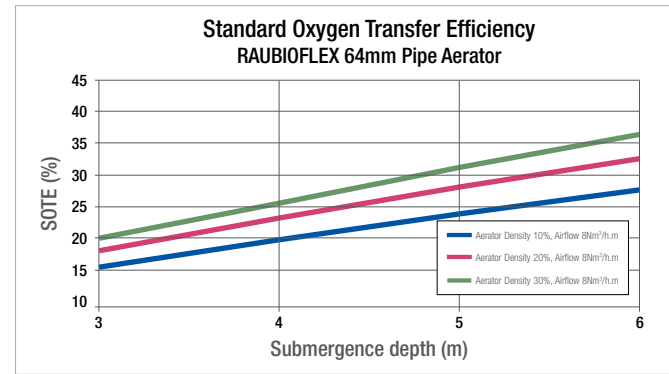


Figure 10-8: SOTE for RAUBIOFLEX STD and DUO Ø64mm pipe aerator

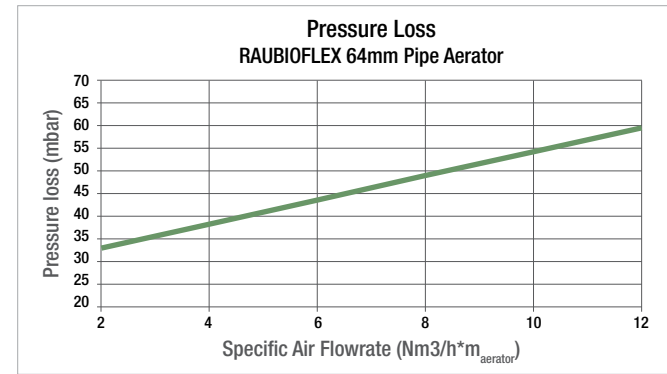


Figure 10-9: Pressure loss for RAUBIOFLEX STD and DUO Ø64mm (without non-return valve)

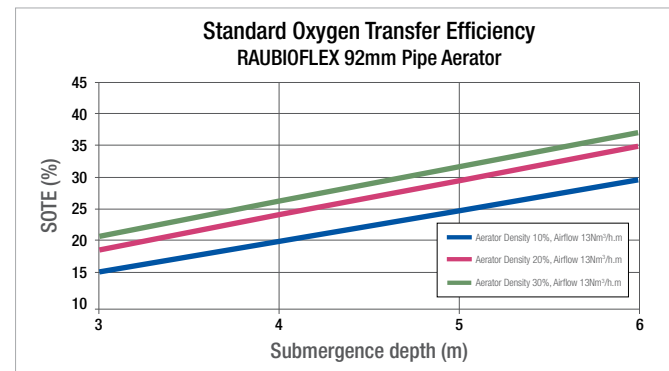


Figure 10-10: SOTE for RAUBIOFLEX DUO Ø92mm pipe aerator

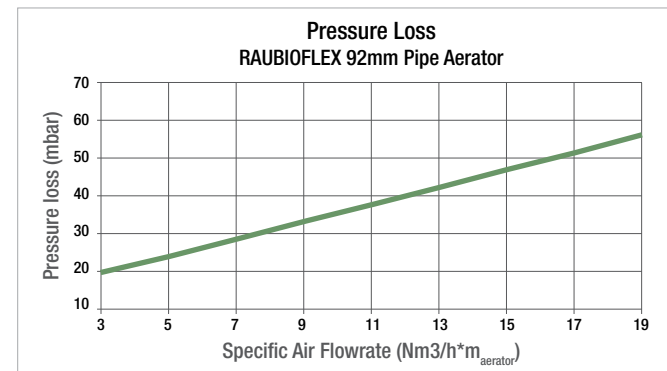


Figure 10-11: Pressure loss for RAUBIOFLEX DUO Ø92mm pipe aerator (without non-return valve)

10.1.4 Arrangement of disc aerator

In order to optimise the uniformity of bubble distribution, spacing between adjacent disc aerators within the aeration tank should be similar. Disc aerator 200, disc aerator 225 and disc aerator 300 are typically spaced between 400 and 600mm, 600 and 800mm and 800 and 1000mm respectively.

10.1.4.1 Impact of mixers and recirculation pumps on disc aerator arrangement

Similar to the pipe aerators, disc aerators should be installed at a safe distance from submerged mixers and recirculation pumps. The flow velocity of wastewater at installation locations should be 0.4m/s or less.

10.1.5 Disc aerator SOTE and pressure loss

10.1.5.1 RAUBIOXON Plus disc aerator

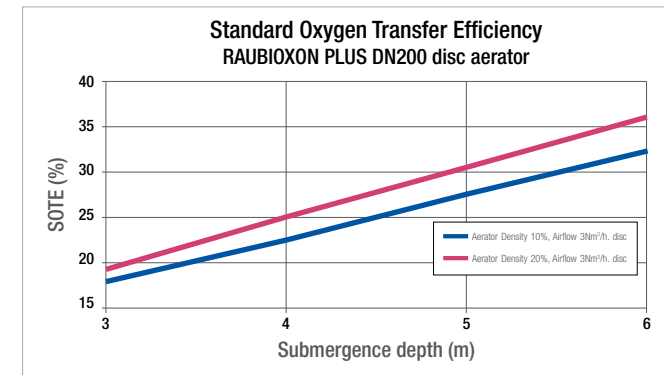


Figure 10-12: SOTE for RAUBIOXON Plus DN200 disc aerator

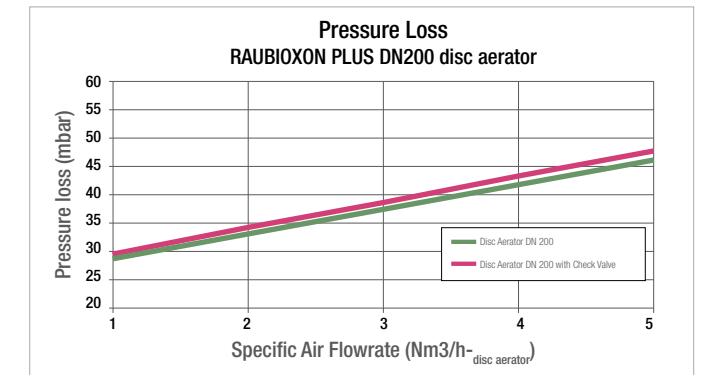


Figure 10-13: Pressure loss for RAUBIOXON Plus DN200 disc aerator

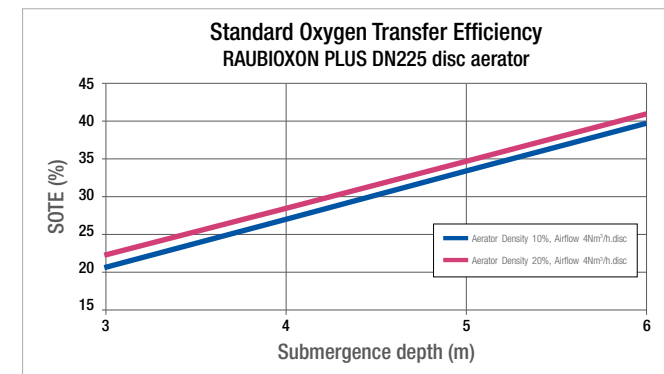


Figure 10-14: SOTE for RAUBIOXON Plus DN225 disc aerator

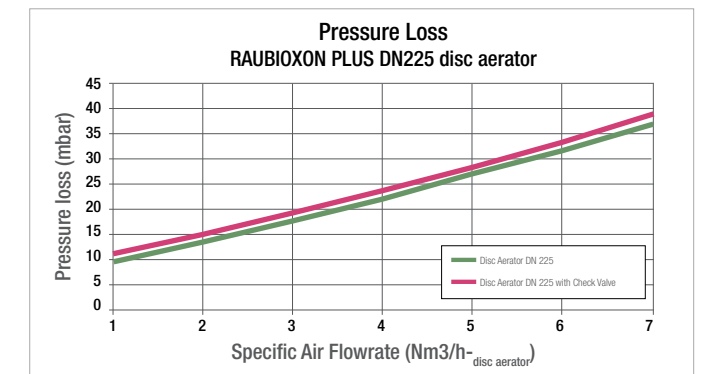


Figure 10-15: Pressure loss for RAUBIOXON Plus DN225 disc aerator

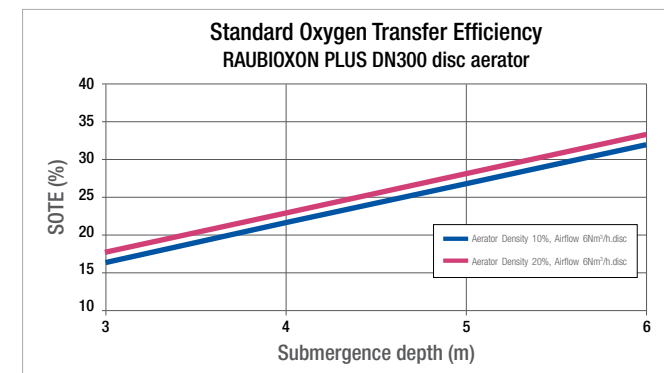


Figure 10-16: SOTE for RAUBIOXON Plus DN300 disc aerator

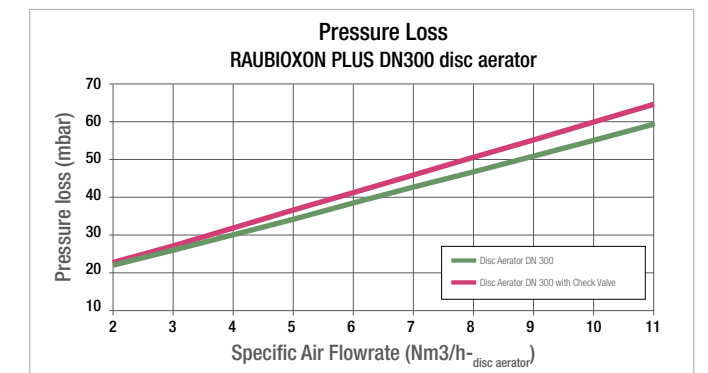


Figure 10-17: Pressure loss for RAUBIOXON Plus DN300 disc aerator

10.1.5.2 RAUBIOFLEX disc aerator

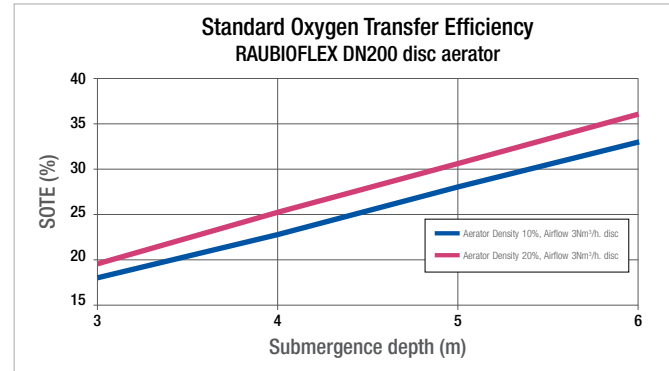


Figure 10-18: SOTE for RAUBIOFLEX DN200 disc aerator

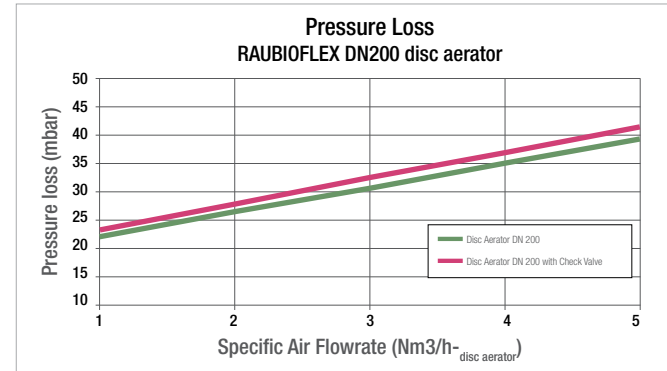


Figure 10-19: Pressure loss for RAUBIOFLEX DN200 disc aerator

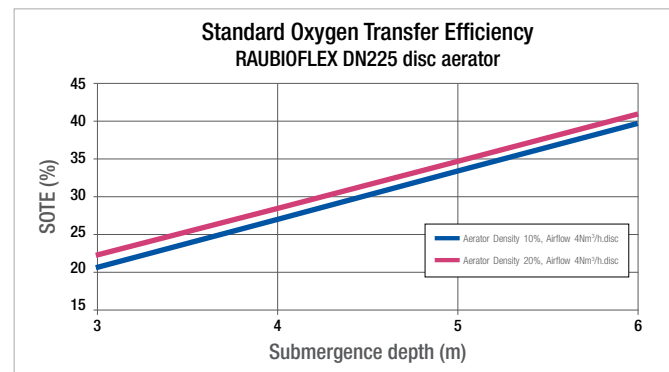


Figure 10-20: SOTE for RAUBIOFLEX DN225 disc aerator

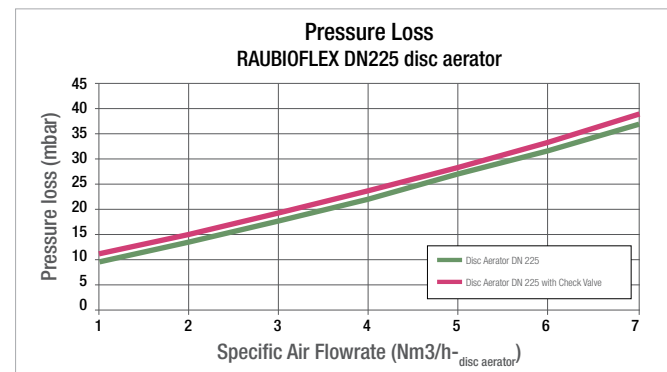


Figure 10-21: Pressure loss for RAUBIOFLEX DN225 disc aerator

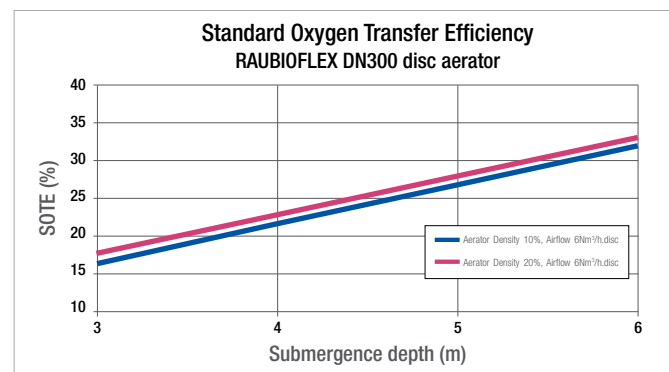


Figure 10-22: SOTE for RAUBIOFLEX DN300 disc aerator

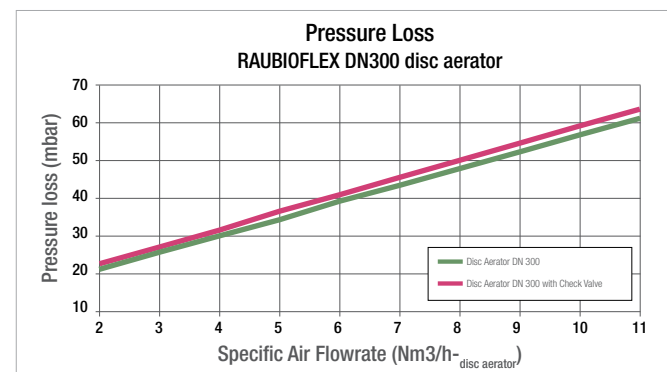


Figure 10-23: Pressure loss for RAUBIOFLEX DN300 disc aerator

10.2 Measurement of oxygen capacity

Oxygen transfer needs to be determined by testing. In most cases, measurements to determine the amount of oxygen transferred are done in clean water via the absorption method. In the absorption method, chemicals, namely sodium sulfite and cobalt catalysts, are added to remove all the dissolved oxygen (DO) from the clean water. Oxygen is then added using the aerator system. Due to the re-aeration process, the DO concentration increases from zero to a maximum saturation. The data points obtained during the re-aeration process are used to define a DO concentration with respect to time curve, which is used to calculate the specific oxygen absorption rate and SOTE. In Germany, measurements of the oxygen transfer in clean water in aeration tanks of activated sludge plants are carried out in accordance to DIN EN 12255-15. However, it is still necessary for certain parameters such as the permissible result tolerances to be specifically agreed between the supplier and the customer.

10.3 Retrievable aerator grid

Retrievable aerator grid system that can be directly lifted out, while the aeration tank is in operation, has to be carefully planned for. When planning and designing such system, it is important to consider the followings:

1. Adequate safe area to place removed grids for maintenance is made available.
2. Access should be available on both ends of the retrievable grid to facilitate grid removal and installation.
3. Lifting bay or road is structurally designed to support the mobile crane lifting activity.
4. The reach of the crane is enough to access the maintenance zone and the grid's installation locations.
5. The retrievable grid's span should be 10m or less.

Design data

Sender

Last name:

First name:

Company:

Town and postcode:

Telephone/Fax:

E-mail:

Wastewater plant/project

Project:

Client:

Address:

Town and postcode:

Telephone/Fax:

Contact person:

Design data for:

Size: Population equivalent or m³/day

Type of wastewater:

Please specify the % of industrial wastewater within the combined wastewater if the type of wastewater is combined:

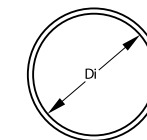
Type of industry:

Is there any organic solvent in wastewater? i.e. toluene, benzene:

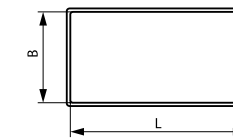
Please specify the type and concentration of organic solvent if there is any in wastewater

Tank geometry and quantity

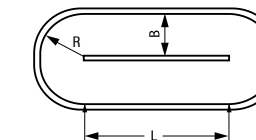
- Circular tank



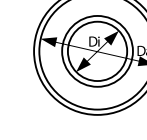
- Rectangular tank



- Circulatory tank



- Combination tank



Number of identical aeration tanks nos.

Tank dimensions and wastewater levels

Tank depth m

Top wastewater depth m

Bottom wastewater depth m

Design wastewater depth m

Outside diameter (Da): m

Radius (R): m

Inside diameter (Di): m

Width (B): m

Length (L): m

Process design parameters for aeration tank

Type of treatment process

Please specify if the type of treatment process is others:

| | | | |
|--|------|-------------------------|----------------------------|
| Type of aeration grid | | | |
| Type of aerator | | | |
| Altitude of WWTP/STP above sea level | | m | |
| Ambient temperature | | °C | |
| Wastewater temperature | min: | max: | °C |
| Design wastewater inflow per tank | | m ³ /hr-tank | |
| Average wastewater inflow per tank | | m ³ /hr-tank | |
| Maximum wastewater inflow per tank | | m ³ /hr-tank | |
| Inlet BOD | min: | max: | mg/L |
| Outlet BOD | min: | max: | mg/L |
| Inlet COD | min: | max: | mg/L |
| Outlet COD | min: | max: | mg/L |
| Influent TKN | min: | max: | mg/L |
| Effluent NH4-N | min: | max: | mg/L |
| Operating MLSS | min: | max: | mg/L |
| DO conc.to be maintained | min: | max: | mg/L |
| Salinity | min: | max: | mg/L |
| Total oxygen demand (wastewater) per tank (AOR) | min: | max: | kg/h-tank |
| Total oxygen demand (clean water) per tank (SOR) | min: | max: | kg/h-tank |
| Air flow requirement per tank * | min: | max: | **Nm ³ /hr-tank |

* Optional

** Volume of air at 0°C and 1 atm

Blower and mixer details

| | |
|---|-----------------------|
| Make / type | |
| <i>Please specify if the blower is others</i> | |
| Operating quantity | nos. |
| Blower unit capacity | **Nm ³ /hr |
| Blower project capacity | **Nm ³ /hr |
| Maximum operating pressure | mbar |
| Is mixer used in the aerator tank? | |

Please specify its capacity, location and orientation if mixer is to be used in the aeration tank

Reply details

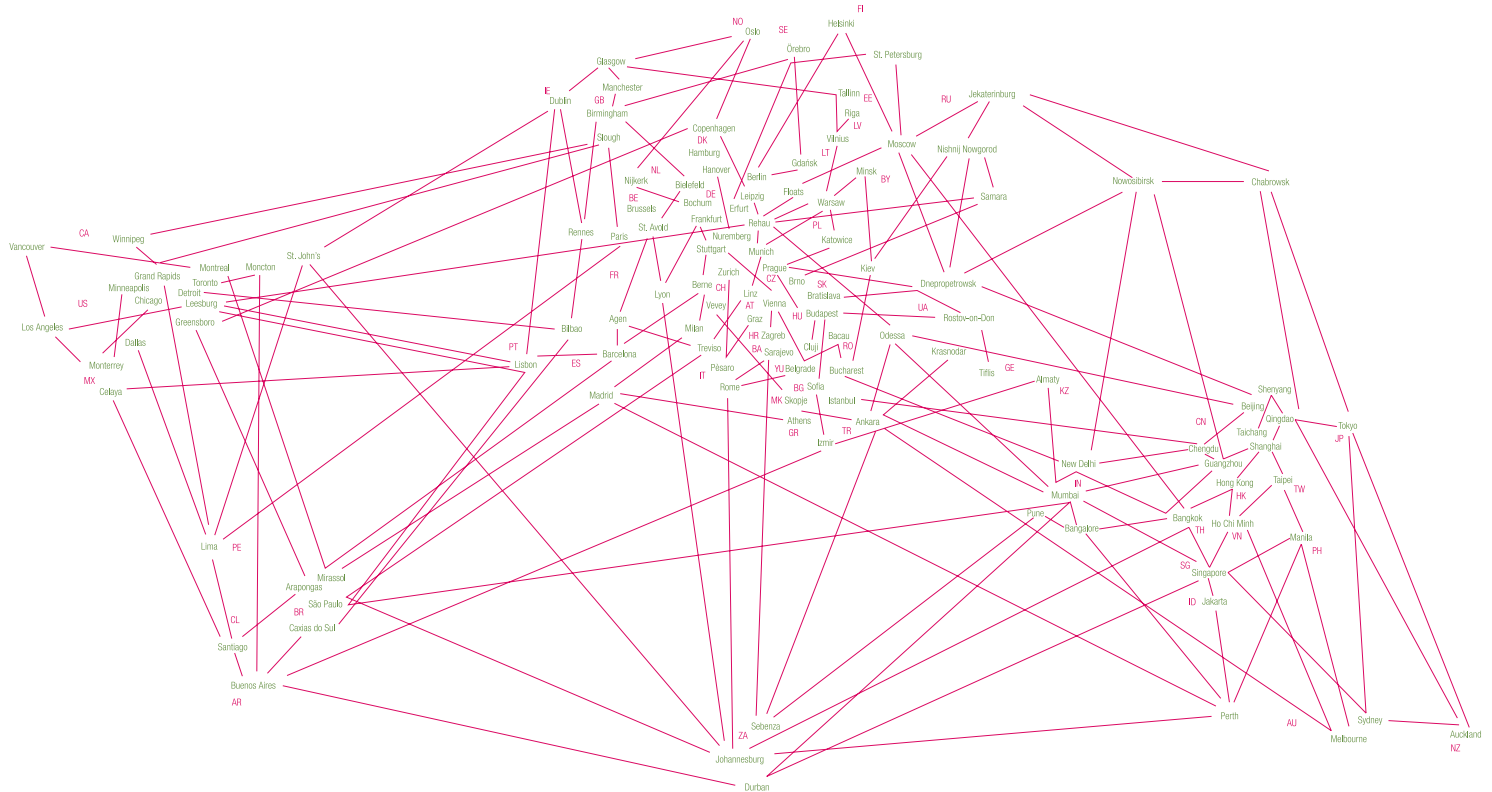
Please give the address to which you would like the reply sent. For the fastest possible response, please indicate a fax number or e-mail address.

| | | |
|----------------------|-----------------------------------|-------------------------------------|
| By e-mail | Address or fax number | |
| <input type="text"/> | <input type="checkbox"/> as above | <input type="checkbox"/> as follows |

Reply address

| | |
|----------------------|--|
| Company: | |
| Name: | |
| Town and postcode: | |
| Telephone/Fax: | |
| E-Mail: | |
| Remarks: | |
| <input type="text"/> | |

** Volume of air at 0°C and 1 atm



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The use of REHAU products in conditions that are beyond our control or for applications other than those specified releases us from any obligation in regard to claims made in respect of the products.

We recommend that the suitability of any REHAU product for the intended application should be checked. Utilization and processing of our products are beyond our control and are therefore exclusively your responsibility. In the event that a liability is nevertheless considered, any compensation will be limited to the value of the goods supplied by us and used by you.

Our warranty assumes consistent quality of our products in accordance with our specification and in accordance with our general conditions of sale.

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