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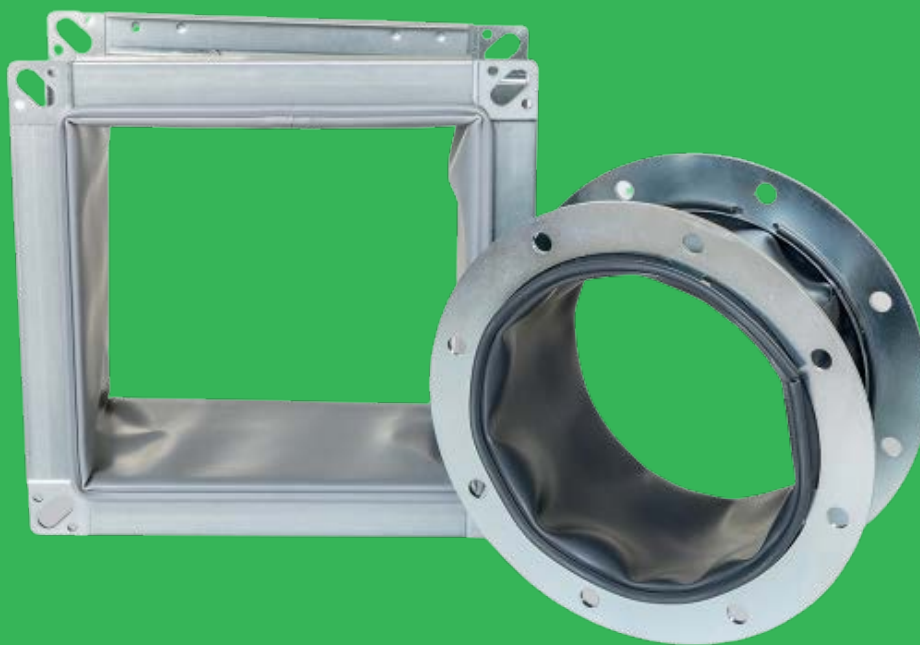
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# Амортизационные вставки FFDM



These Technical Specifications specify a number of manufactured sizes and designs of FFDM damping pads (hereinafter the pads only). They apply to production, design, ordering, delivery, assembly, and operation.

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## II. GENERAL

### 1. Description

- 1.1. The damping pads (hereinafter the pads only) are used to prevent the transmission of dynamic forces caused by vibrations of fans, units or other devices to the connected ventilation ducts and their returning transmission of forces caused by vibration, dilatation or weight.
- 1.2. The pads comply with the working conditions of air ducts of Group I and temperature from -10°C to 80°C.
- 1.3. The pads are designed for piping with the maximum pressure to 1500 Pa.
- 1.4. The class of tightness through the damping pad body is "D".
- 1.5. The pads are designed for a weather-protected environment with the weather classification of class 3K5, without condensation, icing, ice formation and without water from sources other than rain, in accordance with EN 60 721-3-3 mod. A2.
- 1.6. The pads are designed for air masses without any abrasive, chemical, and sticky additives.
- 1.7. All the dimensions and weights, unless stated otherwise, are in mm and kg.

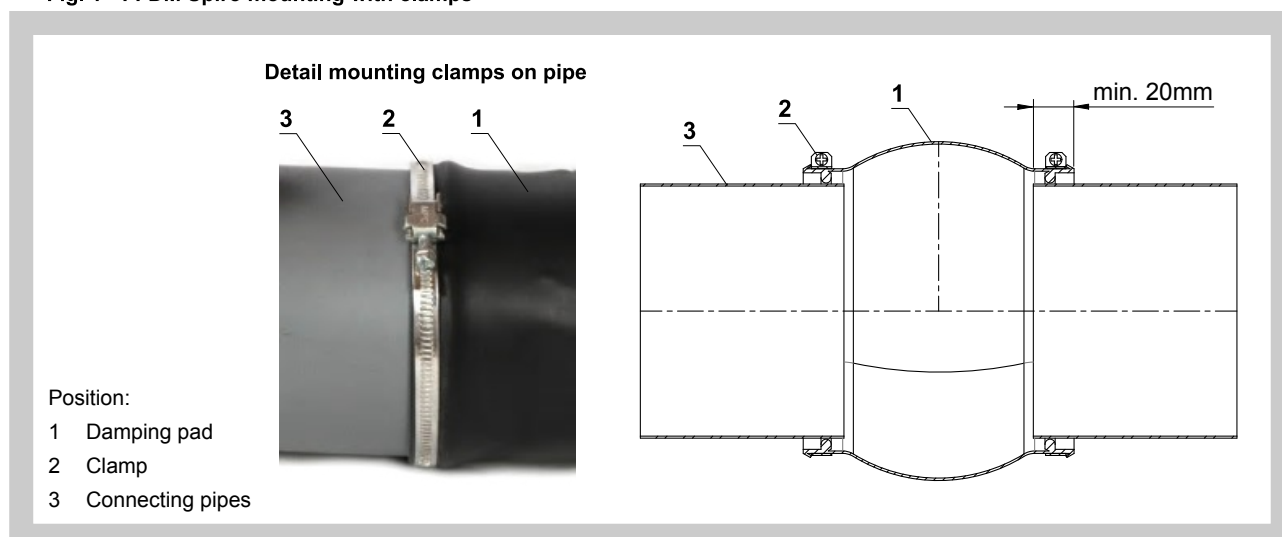
### 2. Design

- 2.1. The pad assembly consists of a pair of galvanized or stainless steel (AISI 304) sheet flanges connected by flexible sleeves of special softened polyester / PVC. The sleeves are available in their 4 basic versions with temperature resistance of up to 80°C and 200°C, as well as the version for up to 80°C with its certification for fire dampers and up to 80°C with ATEX certification. One may also choose from two 105 mm and 155 mm damping pad lengths.
- 2.2. The square pad flanges are 30 or 20 mm wide, featuring holes in the corners.
- 2.3. The round pads feature their connecting flange dimensions per EN 12 220. We supply versions without flanges to Spiro as well.

### 3. Installation and location

- 3.1. The damping pads are designed for installation into HVAC piping. Our pads operate in any position.
- 3.2. When assembled with any other HVAC parts, the flexible pads must not be stretched.

Fig. 1 FFDM Spiro mounting with clamps



4. Dimensions and weights

Fig. 2 Damping pad - Square

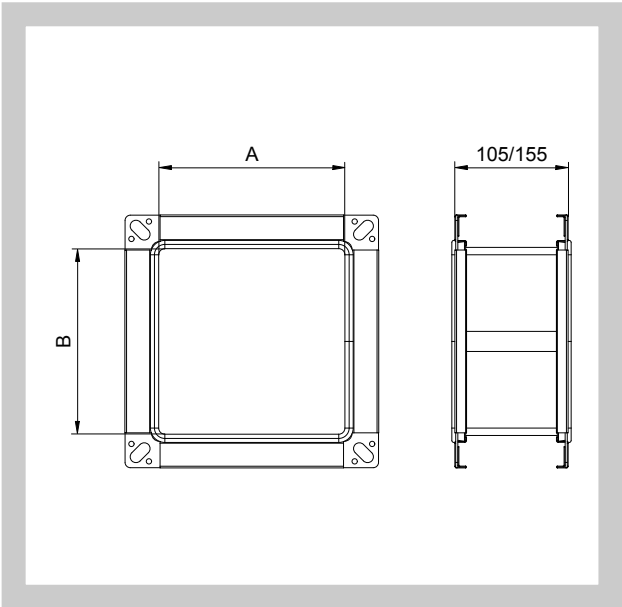


Fig. 3 Damping pad - Square



Fig. 4 Corner flange 30 mm

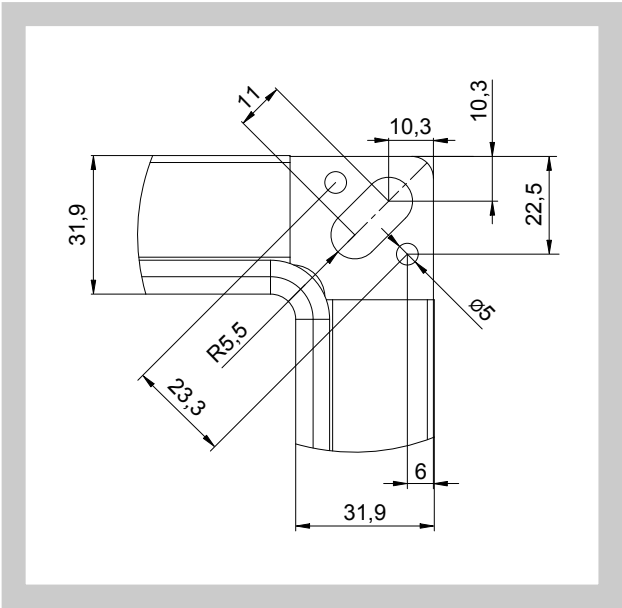
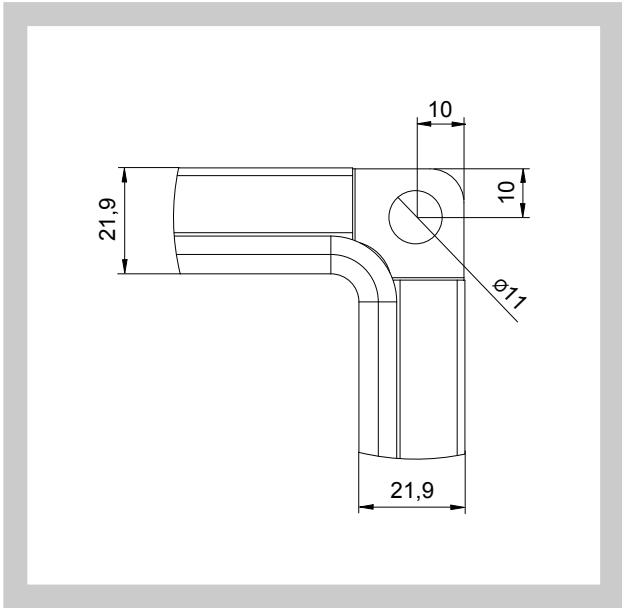


Fig. 5 Corner flange 20 mm



Tab. 1 Square sleeves 105 mm

| A x B<br>[mm] | Weight [kg]     |                 |                       | A x B<br>[mm] | Weight [kg]     |                 |                       |
|---------------|-----------------|-----------------|-----------------------|---------------|-----------------|-----------------|-----------------------|
|               | Galvan.<br>30mm | Galvan.<br>20mm | Stainless V2A<br>30mm |               | Galvan.<br>30mm | Galvan.<br>20mm | Stainless V2A<br>30mm |
| 125 x 125     | 0,70            | 0,56            | 0,71                  | 1000 x 900    | 5,14            | 4,18            | 5,21                  |
| 160 x 125     | 0,79            | 0,64            | 0,80                  | x 1000        | 5,41            | 4,40            | 5,49                  |
| x 160         | 0,89            | 0,72            | 0,90                  | 1100 x 630    | 4,68            | 3,81            | 4,75                  |
| 200 x 160     | 0,99            | 0,81            | 1,01                  | x 710         | 4,90            | 3,99            | 4,97                  |
| x 200         | 1,10            | 0,89            | 1,12                  | x 800         | 5,14            | 4,18            | 5,21                  |
| 250 x 160     | 1,13            | 0,91            | 1,14                  | x 900         | 5,41            | 4,40            | 5,49                  |
| x 200         | 1,24            | 1,00            | 1,25                  | x 1000        | 5,68            | 4,62            | 5,76                  |
| x 250         | 1,37            | 1,11            | 1,39                  | x 1100        | 5,95            | 4,84            | 6,03                  |
| 315 x 160     | 1,30            | 1,06            | 1,32                  | 1250 x 710    | 5,30            | 4,32            | 5,38                  |
| x 200         | 1,41            | 1,15            | 1,43                  | x 800         | 5,55            | 4,51            | 5,62                  |
| x 250         | 1,55            | 1,25            | 1,57                  | x 900         | 5,82            | 4,73            | 5,89                  |
| x 315         | 1,72            | 1,40            | 1,74                  | x 1000        | 6,09            | 4,95            | 6,17                  |
| 400 x 200     | 1,64            | 1,33            | 1,66                  | x 1100        | 6,35            | 5,17            | 6,44                  |
| x 250         | 1,77            | 1,44            | 1,80                  | x 1250        | 6,76            | 5,50            | 6,85                  |
| x 315         | 1,95            | 1,58            | 1,98                  | 1400 x 630    | 5,49            | 4,47            | 5,57                  |
| x 400         | 2,18            | 1,77            | 2,21                  | x 710         | 5,71            | 4,64            | 5,79                  |
| 500 x 250     | 2,04            | 1,66            | 2,07                  | x 800         | 5,95            | 4,84            | 6,03                  |
| x 315         | 2,22            | 1,80            | 2,25                  | x 900         | 6,22            | 5,06            | 6,30                  |
| x 400         | 2,45            | 1,99            | 2,48                  | x 1000        | 6,49            | 5,28            | 6,58                  |
| x 500         | 2,72            | 2,21            | 2,75                  | x 1100        | 6,76            | 5,50            | 6,85                  |
| 630 x 315     | 2,57            | 2,09            | 2,60                  | x 1250        | 7,16            | 5,83            | 7,26                  |
| x 400         | 2,80            | 2,28            | 2,84                  | x 1400        | 7,57            | 6,16            | 7,67                  |
| x 500         | 3,07            | 2,49            | 3,11                  | 1600 x 800    | 6,49            | 5,28            | 6,58                  |
| x 630         | 3,42            | 2,78            | 3,46                  | x 900         | 6,76            | 5,50            | 6,85                  |
| 710 x 400     | 3,01            | 2,45            | 3,05                  | x 1000        | 7,03            | 5,72            | 7,12                  |
| x 500         | 3,28            | 2,67            | 3,33                  | x 1100        | 7,30            | 5,94            | 7,40                  |
| x 630         | 3,63            | 2,96            | 3,68                  | x 1250        | 7,70            | 6,27            | 7,81                  |
| x 710         | 3,85            | 3,13            | 3,90                  | x 1400        | 8,11            | 6,60            | 8,22                  |
| 800 x 400     | 3,26            | 2,65            | 3,30                  | 1800 x 900    | 7,30            | 5,94            | 7,40                  |
| x 500         | 3,53            | 2,87            | 3,57                  | x 1000        | 7,57            | 6,16            | 7,67                  |
| x 630         | 3,88            | 3,15            | 3,93                  | x 1100        | 7,84            | 6,38            | 7,94                  |
| x 710         | 4,09            | 3,33            | 4,15                  | x 1250        | 8,24            | 6,71            | 8,35                  |
| x 800         | 4,33            | 3,53            | 4,39                  | x 1400        | 8,64            | 7,04            | 8,76                  |
| 900 x 500     | 3,80            | 3,09            | 3,85                  | x 1600        | 9,18            | 7,47            | 9,31                  |
| x 630         | 4,15            | 3,37            | 4,20                  | x 1800        | 9,72            | 7,91            | 9,85                  |
| x 710         | 4,36            | 3,55            | 4,42                  | 2000 x 1000   | 8,11            | 6,60            | 8,22                  |
| x 800         | 4,60            | 3,75            | 4,67                  | x 1100        | 8,38            | 6,82            | 8,49                  |
| x 900         | 4,87            | 3,96            | 4,94                  | x 1250        | 8,78            | 7,15            | 8,90                  |
| 1000 x 500    | 4,06            | 3,31            | 4,12                  | x 1400        | 9,18            | 7,47            | 9,31                  |
| x 630         | 4,42            | 3,59            | 4,47                  | x 1600        | 9,72            | 7,91            | 9,85                  |
| x 710         | 4,63            | 3,77            | 4,69                  | x 1800        | 10,26           | 8,35            | 10,40                 |
| x 800         | 4,87            | 3,96            | 4,94                  | x 2000        | 10,80           | 8,79            | 10,95                 |

If required, we can supply our square damping pads of all inter-dimensions of the aforementioned basic range

Tab. 2 Square sleeves 155 mm

| A x B<br>[mm] | Weight [kg]     |                 |                       | A x B<br>[mm] | Weight [kg]     |                 |                       |
|---------------|-----------------|-----------------|-----------------------|---------------|-----------------|-----------------|-----------------------|
|               | Galvan.<br>30mm | Galvan.<br>20mm | Stainless V2A<br>30mm |               | Galvan.<br>30mm | Galvan.<br>20mm | Stainless V2A<br>30mm |
| 125 x 125     | 0,74            | 0,60            | 0,75                  | 1000 x 900    | 5,43            | 4,48            | 5,50                  |
| 160 x 125     | 0,84            | 0,69            | 0,85                  | x 1000        | 5,72            | 4,71            | 5,79                  |
| x 160         | 0,94            | 0,77            | 0,95                  | 1100 x 630    | 4,95            | 4,08            | 5,01                  |
| 200 x 160     | 1,05            | 0,86            | 1,06                  | x 710         | 5,18            | 4,26            | 5,24                  |
| x 200         | 1,16            | 0,96            | 1,18                  | x 800         | 5,43            | 4,48            | 5,50                  |
| 250 x 160     | 1,19            | 0,98            | 1,21                  | x 900         | 5,72            | 4,71            | 5,79                  |
| x 200         | 1,31            | 1,07            | 1,32                  | x 1000        | 6,00            | 4,94            | 6,08                  |
| x 250         | 1,45            | 1,19            | 1,47                  | x 1100        | 6,29            | 5,18            | 6,37                  |
| 315 x 160     | 1,38            | 1,13            | 1,40                  | 1250 x 710    | 5,60            | 4,62            | 5,68                  |
| x 200         | 1,49            | 1,23            | 1,51                  | x 800         | 5,86            | 4,83            | 5,94                  |
| x 250         | 1,63            | 1,34            | 1,65                  | x 900         | 6,15            | 5,06            | 6,22                  |
| x 315         | 1,82            | 1,50            | 1,84                  | x 1000        | 6,43            | 5,30            | 6,51                  |
| 400 x 200     | 1,73            | 1,42            | 1,76                  | x 1100        | 6,72            | 5,53            | 6,80                  |
| x 250         | 1,88            | 1,54            | 1,90                  | x 1250        | 7,14            | 5,88            | 7,23                  |
| x 315         | 2,06            | 1,69            | 2,09                  | 1400 x 630    | 5,80            | 4,78            | 5,88                  |
| x 400         | 2,30            | 1,89            | 2,33                  | x 710         | 6,03            | 4,97            | 6,11                  |
| 500 x 250     | 2,16            | 1,78            | 2,19                  | x 800         | 6,29            | 5,18            | 6,37                  |
| x 315         | 2,35            | 1,93            | 2,38                  | x 900         | 6,57            | 5,41            | 6,66                  |
| x 400         | 2,59            | 2,13            | 2,62                  | x 1000        | 6,86            | 5,65            | 6,95                  |
| x 500         | 2,87            | 2,36            | 2,91                  | x 1100        | 7,14            | 5,88            | 7,23                  |
| 630 x 315     | 2,72            | 2,23            | 2,75                  | x 1250        | 7,57            | 6,24            | 7,67                  |
| x 400         | 2,96            | 2,43            | 3,00                  | x 1400        | 8,00            | 6,59            | 8,10                  |
| x 500         | 3,24            | 2,67            | 3,28                  | 1600 x 800    | 6,86            | 5,65            | 6,95                  |
| x 630         | 3,61            | 2,97            | 3,66                  | x 900         | 7,14            | 5,88            | 7,23                  |
| 710 x 400     | 3,19            | 2,62            | 3,23                  | x 1000        | 7,43            | 6,12            | 7,52                  |
| x 500         | 3,47            | 2,86            | 3,51                  | x 1100        | 7,71            | 6,35            | 7,81                  |
| x 630         | 3,84            | 3,16            | 3,89                  | x 1250        | 8,14            | 6,70            | 8,24                  |
| x 710         | 4,07            | 3,35            | 4,12                  | x 1400        | 8,57            | 7,06            | 8,67                  |
| 800 x 400     | 3,44            | 2,83            | 3,49                  | 1800 x 900    | 7,71            | 6,35            | 7,81                  |
| x 500         | 3,73            | 3,07            | 3,77                  | x 1000        | 8,00            | 6,59            | 8,10                  |
| x 630         | 4,10            | 3,37            | 4,15                  | x 1100        | 8,28            | 6,82            | 8,39                  |
| x 710         | 4,32            | 3,56            | 4,38                  | x 1250        | 8,71            | 7,17            | 8,82                  |
| x 800         | 4,58            | 3,77            | 4,64                  | x 1400        | 9,13            | 7,53            | 9,25                  |
| 900 x 500     | 4,01            | 3,30            | 4,06                  | x 1600        | 9,70            | 8,00            | 9,83                  |
| x 630         | 4,38            | 3,61            | 4,44                  | x 1800        | 10,27           | 8,46            | 10,40                 |
| x 710         | 4,61            | 3,79            | 4,67                  | 2000 x 1000   | 8,57            | 7,06            | 8,67                  |
| x 800         | 4,86            | 4,01            | 4,93                  | x 1100        | 8,85            | 7,29            | 8,96                  |
| x 900         | 5,15            | 4,24            | 5,22                  | x 1250        | 9,28            | 7,64            | 9,40                  |
| 1000 x 500    | 4,30            | 3,54            | 4,35                  | x 1400        | 9,70            | 8,00            | 9,83                  |
| x 630         | 4,67            | 3,84            | 4,73                  | x 1600        | 10,27           | 8,46            | 10,40                 |
| x 710         | 4,89            | 4,03            | 4,96                  | x 1800        | 10,84           | 8,93            | 10,98                 |
| x 800         | 5,15            | 4,24            | 5,22                  | x 2000        | 11,41           | 9,40            | 11,56                 |

If required, we can supply our square damping pads of all inter-dimensions of the aforementioned basic range

Fig. 6 Pad – Round with flange

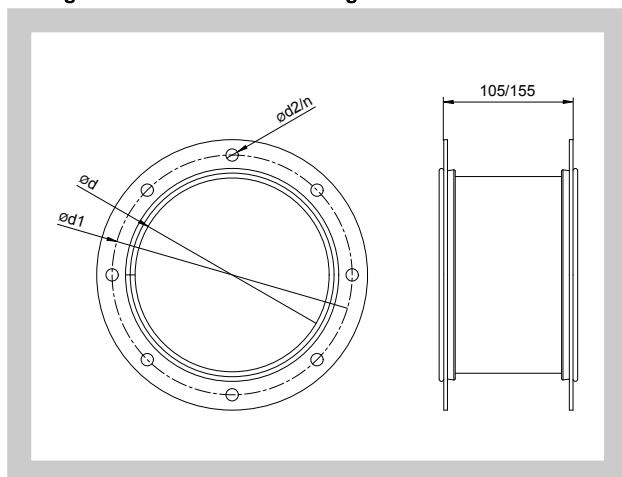


Fig. 7 Pad – Round with flange

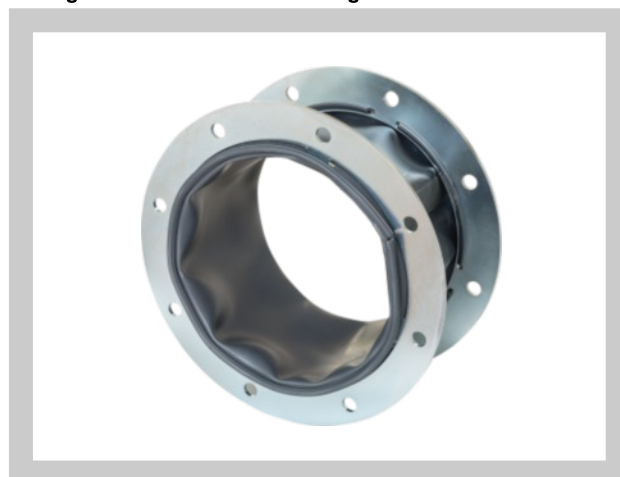


Fig. 8 Pad – Round Spiro

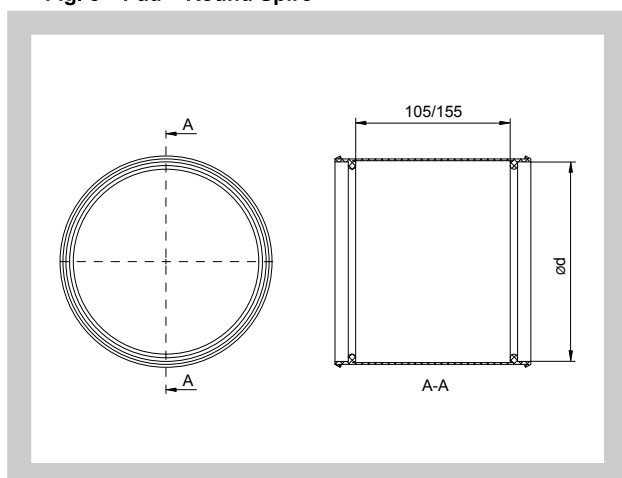


Fig. 9 Pad – Round Spiro

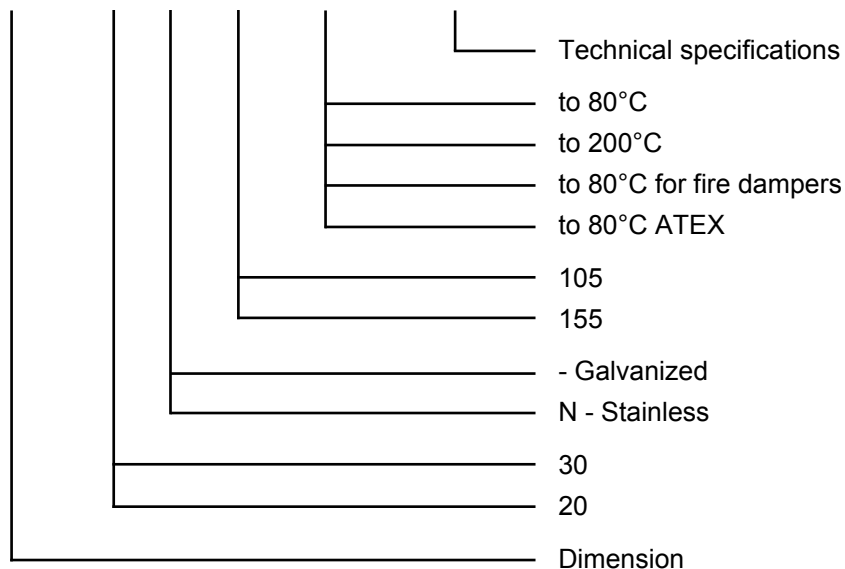


Tab. 3 Round sleeves

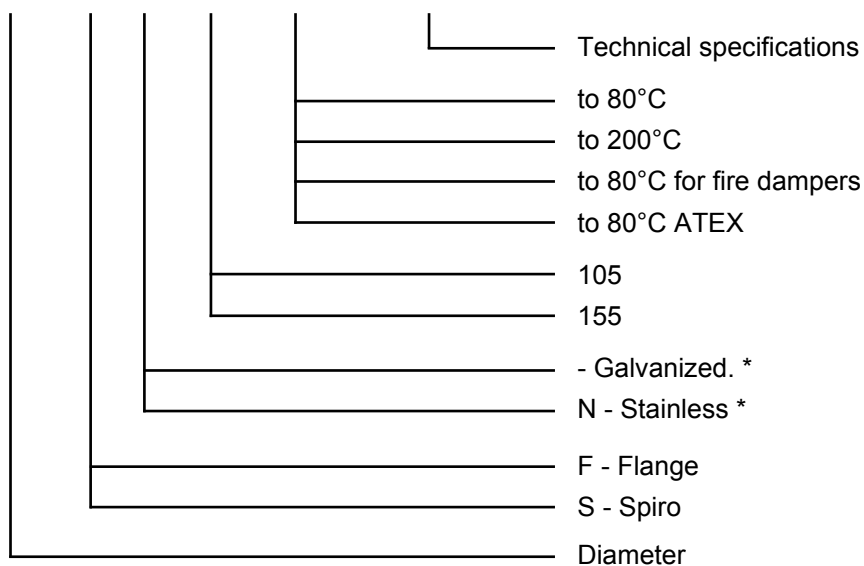
| Dimension<br>ød | d1  | d2 | n  | Sleeve 105  |               |               | Sleeve 155  |               |               |
|-----------------|-----|----|----|-------------|---------------|---------------|-------------|---------------|---------------|
|                 |     |    |    | Flange [kg] |               | Spiro<br>[kg] | Flange [kg] |               | Spiro<br>[kg] |
|                 |     |    |    | Galvan.     | Stainless V2A |               | Galvan.     | Stainless V2A |               |
| 80              | 110 | 10 | 4  | 0,4         | 0,41          | 0,07          | 0,42        | 0,43          | 0,09          |
| 100             | 130 | 10 | 4  | 0,48        | 0,49          | 0,08          | 0,5         | 0,51          | 0,11          |
| 125             | 155 | 10 | 8  | 0,56        | 0,58          | 0,1           | 0,59        | 0,61          | 0,13          |
| 160             | 195 | 10 | 8  | 0,86        | 0,88          | 0,13          | 0,89        | 0,91          | 0,17          |
| 180             | 215 | 10 | 8  | 0,97        | 0,99          | 0,14          | 1           | 1,02          | 0,19          |
| 200             | 235 | 10 | 8  | 1,06        | 1,08          | 0,16          | 1,1         | 1,12          | 0,21          |
| 225             | 260 | 10 | 8  | 1,18        | 1,2           | 0,18          | 1,22        | 1,24          | 0,24          |
| 250             | 285 | 10 | 8  | 1,29        | 1,32          | 0,2           | 1,34        | 1,37          | 0,26          |
| 280             | 315 | 10 | 8  | 1,43        | 1,47          | 0,22          | 1,48        | 1,52          | 0,29          |
| 315             | 350 | 10 | 12 | 1,59        | 1,63          | 0,25          | 1,65        | 1,69          | 0,33          |
| 355             | 390 | 10 | 12 | 1,78        | 1,82          | 0,28          | 1,84        | 1,89          | 0,37          |
| 400             | 445 | 12 | 12 | 2,66        | 2,76          | 0,32          | 2,73        | 2,84          | 0,42          |
| 450             | 495 | 12 | 12 | 2,97        | 3,04          | 0,36          | 3,06        | 3,13          | 0,47          |
| 500             | 545 | 12 | 16 | 3,27        | 3,34          | 0,4           | 3,38        | 3,44          | 0,52          |
| 560             | 605 | 12 | 16 | 3,64        | 3,72          | 0,45          | 3,75        | 3,83          | 0,58          |
| 630             | 680 | 12 | 16 | 4,6         | 4,7           | 0,5           | 4,72        | 4,82          | 0,66          |
| 710             | 760 | 12 | 20 | 5,14        | 5,26          | 0,57          | 5,27        | 5,39          | 0,74          |
| 800             | 860 | 12 | 20 | 6,42        | 6,57          | 0,64          | 6,57        | 6,72          | 0,84          |

## 5. Order key

|      |        |           |    |   |     |      |            |
|------|--------|-----------|----|---|-----|------|------------|
| FFDM | square | 400 x 200 | 30 | - | 105 | 80°C | TPM 137/19 |
|------|--------|-----------|----|---|-----|------|------------|



|      |       |     |   |   |     |      |            |
|------|-------|-----|---|---|-----|------|------------|
| FFDM | round | 200 | F | - | 105 | 80°C | TPM 137/19 |
|------|-------|-----|---|---|-----|------|------------|



\* Spiro design requires no material data – stainless tightening clamps (AISI 304)

**IV. PACKAGING, TRANSPORT, ACCEPTANCE, STORAGE AND WARRANTY****6. Logistic data**

- 6.1. We supply our pads unpackaged. For transport and storage, we separate our damping pad flanges with cardboard paper, which is removed during assembly. They are transported freely laid in covered vehicles. When handling during transport and storage, cabinets must be protected against mechanical damage and weather impacts.
- 6.2. If no acceptance method is specified in the order, a handover of grids to the carrier will be considered an acceptance.
- 6.3. Our pads must be stored in covered facilities, in environments free of aggressive vapours, gases, and dust.
- 6.4. If our damping pads are damaged during their transport, it is necessary to write a protocol with the carrier during their acceptance for the subsequent complaint purposes.

**7. Warranty**

- 7.1. The manufacturer provides a 24-month warranty for its damping pads from the date of their shipment.
- 7.2. The warranty expires when our pads are used for other purposes, equipment, and working conditions than permitted by this standard or after their mechanical damage occurred during handling.