

|                                    |                                                                            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------------|----------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Firma und Anschrift                | KLINGER Kempchen - 46147 Oberhausen - Im Waldteich 21                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Dichtungstyp                       | Kammprofilichtung B9A-Graphit (1.4541 / 0,5 mm; D = 1,0 g/cm³)             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Dichtungsmaße e <sub>GO</sub> [mm] | Ø 53 / 69 x 4,80 mm (DIN 1514-6)                                           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bemerkung:                         | Bei höheren Innendrücken wurde eine höhere Anfangsflächenpressung gewählt! |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

according to  
**DIN EN 13555**  
2014-07

| erforderliche Mindest-Flächenpressung $Q_{\min}$ (bei Montage), $Q_{\text{Smin}}$ (nach Entlastung) für p = 10 bar bis 160 bar |                    |               |               |                |                           |               |               |                |               |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                   |               |               |                |                   |               |               |                |                   |    |     |     |     |     |     |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|---------------|----------------|---------------------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|------------------|---------------|---------------|----------------|------------------|---------------|---------------|----------------|------------------|---------------|---------------|----------------|------------------|---------------|---------------|----------------|-------------------|---------------|---------------|----------------|-------------------|---------------|---------------|----------------|-------------------|----|-----|-----|-----|-----|-----|
| L<br>[mg/(s·m)]                                                                                                                | $Q_{\min/L}$ [MPa] |               |               |                | $Q_{\text{Smin/L}}$ [MPa] |               |               |                |               |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                   |               |               |                |                   |               |               |                |                   |    |     |     |     |     |     |
|                                                                                                                                |                    |               |               |                | $Q_A = 20$ [MPa]          |               |               |                |               |               |               |                | $Q_A = 30$ [MPa] |               |               |                | $Q_A = 40$ [MPa] |               |               |                | $Q_A = 60$ [MPa] |               |               |                | $Q_A = 80$ [MPa] |               |               |                | $Q_A = 100$ [MPa] |               |               |                | $Q_A = 120$ [MPa] |               |               |                | $Q_A = 160$ [MPa] |    |     |     |     |     |     |
|                                                                                                                                | p=10<br>[bar]      | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar]             | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar] | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar]    | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar]    | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar]    | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar]    | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar]     | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] | p=10<br>[bar]     | p=40<br>[bar] | p=80<br>[bar] | p=160<br>[bar] |                   |    |     |     |     |     |     |
| 10 <sup>-0</sup>                                                                                                               | <5                 | <5            | <20           | <40            | <5                        | <5            |               |                | <5            | <5            | <10           |                | <5               | <5            | <10           |                | <5               | <5            | <10           | <40            | <5               | <5            | <10           | <40            | <5               | <5            | <10           | <40            | <5                | <5            | <10           | <40            | <5                | <5            | <10           | <40            |                   |    |     |     |     |     |     |
| 10 <sup>-1</sup>                                                                                                               | <5                 | <5            | <20           | <40            | <5                        | <5            |               |                | <5            | <5            | <10           |                | <5               | <5            | <10           |                | <5               | <5            | <10           | <40            | <5               | <5            | <10           | <40            | <5               | <5            | <10           | <40            | <5                | <5            | <10           | <40            | <5                | <5            | <10           | <40            |                   |    |     |     |     |     |     |
| 10 <sup>-2</sup>                                                                                                               | 12                 | 21            | 26            | 42             | <5                        |               |               |                | <5            | <5            | <10           |                | <5               | <5            | <10           |                | <5               | <5            | <10           | <40            | <5               | <5            | <10           | <40            | <5               | <5            | <10           | <40            | <5                | <5            | <10           | <40            | <5                | <5            | <10           | <40            |                   |    |     |     |     |     |     |
| 10 <sup>-3</sup>                                                                                                               | 28                 | 32            | 41            | 93             |                           |               |               |                |               |               |               |                | 22               |               |               |                | 16               | 13            | 27            |                | 12               | 11            | 16            |                | 9                | 9             | 14            |                | 9                 | 9             | 14            | 89             | 9                 | 9             | 14            | 89             | 6                 | 5  | <10 | <40 |     |     |     |
| 10 <sup>-4</sup>                                                                                                               | 56                 | 49            | 61            | 110            |                           |               |               |                |               |               |               |                |                  |               |               |                |                  | 41            |               |                |                  |               |               | 55             | 24               | 36            |               | 38             | 19                | 28            |               | 34             | 19                | 28            |               | 34             | 19                | 28 |     | 22  | 11  | 20  | <40 |
| 10 <sup>-5</sup>                                                                                                               | 90                 | 77            | 92            | 123            |                           |               |               |                |               |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                  | 72            |               |                | 48                | 83            |               | 85             | 48                | 83            |               | 85             | 48                | 83 |     | 59  | 24  | 44  | 53  |
| 10 <sup>-6</sup>                                                                                                               | 131                | 113           | 127           | 148            |                           |               |               |                |               |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                   |               |               |                |                   |               |               |                |                   |    | 116 | 57  | 100 | 107 |     |
| 10 <sup>-7</sup>                                                                                                               |                    | 149           | 157           |                |                           |               |               |                |               |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                   |               |               |                |                   |               |               |                |                   |    |     | 139 | 156 |     |     |
| 10 <sup>-8</sup>                                                                                                               |                    |               |               |                |                           |               |               |                |               |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                  |               |               |                |                   |               |               |                |                   |               |               |                |                   |    |     |     |     |     |     |

| Relaxationsverhältnis P <sub>QR</sub> bei einer Prüfstand-Steiifigkeit von C = 500 kN/mm |                 |                       |                      |                       |                      |                       |                      |                       |                      |                       |                      |                       |
|------------------------------------------------------------------------------------------|-----------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
| Flächenpressung                                                                          | Raumtemperatur  |                       | Temperatur 1 [100°C] |                       | Temperatur 2 [200°C] |                       | Temperatur 3 [300°C] |                       | Temperatur 4 [400°C] |                       | Temperatur 5 [500°C] |                       |
|                                                                                          | P <sub>QR</sub> | Δe <sub>GC</sub> [mm] | P <sub>QR</sub>      | Δe <sub>GC</sub> [mm] | P <sub>QR</sub>      | Δe <sub>GC</sub> [mm] | P <sub>QR</sub>      | Δe <sub>GC</sub> [mm] | P <sub>QR</sub>      | Δe <sub>GC</sub> [mm] | P <sub>QR</sub>      | Δe <sub>GC</sub> [mm] |
| Flächenpressung 1 [ 30 MPa]                                                              | 0,99            | 0,002                 | 0,75                 | 0,023                 | 0,73                 | 0,026                 | 0,59                 | 0,021                 | 0,60                 | 0,038                 | 0,78                 | 0,002                 |
| Flächenpressung 2 [ 50 MPa]                                                              | 0,98            | 0,004                 | 0,89                 | 0,017                 | 0,81                 | 0,030                 | 0,91                 | 0,014                 | 0,61                 | 0,060                 | 0,74                 | 0,041                 |
| Flächenpressung 3 [ 90 MPa]                                                              | 0,99            | 0,003                 | 0,90                 | 0,029                 | 0,99                 | 0,004                 | 0,84                 | 0,046                 | 0,88                 | 0,033                 | 0,83                 | 0,048                 |
| Flächenpressung 4 [ 120 MPa]                                                             |                 |                       |                      |                       |                      |                       |                      |                       |                      |                       |                      |                       |

| maximale Flächenpressung ohne Beschädigung Q <sub>sm</sub> |      |       |      |       |      |       |      |       |      |       |      |       |
|------------------------------------------------------------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| PQR bei Q <sub>sm</sub>                                    | 0,99 | 0,015 | 0,97 | 0,043 | 0,95 | 0,074 | 0,94 | 0,088 | 0,93 | 0,103 | 0,90 | 0,147 |
| Q <sub>sm</sub> [MPa]                                      | 480  |       | 480  |       | 480  |       | 480  |       | 480  |       | 480  |       |

| Sekantenmodul der Dichtung bei Entlastung E <sub>G</sub> und Dichtungshöhe e <sub>G</sub> |                      |                     |                      |                     |                      |                     |                      |                     |                      |                     |                      |                     |
|-------------------------------------------------------------------------------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|
| Flächenpressung [MPa]                                                                     | Raumtemperatur       |                     | Temperatur 1 [100°C] |                     | Temperatur 2 [200°C] |                     | Temperatur 3 [300°C] |                     | Temperatur 4 [400°C] |                     | Temperatur 5 [500°C] |                     |
|                                                                                           | E <sub>G</sub> [MPa] | e <sub>G</sub> [mm] | E <sub>G</sub> [MPa] | e <sub>G</sub> [mm] | E <sub>G</sub> [MPa] | e <sub>G</sub> [mm] | E <sub>G</sub> [MPa] | e <sub>G</sub> [mm] | E <sub>G</sub> [MPa] | e <sub>G</sub> [mm] | E <sub>G</sub> [MPa] | e <sub>G</sub> [mm] |
| 0                                                                                         |                      | 4,6850              |                      | 4,9000              |                      | 4,7000              |                      | 4,6450              |                      | 4,9000              |                      | 4,8000              |
| 1                                                                                         |                      | 4,5900              |                      | 4,4625              |                      | 4,5895              |                      | 4,5570              |                      | 4,4982              |                      | 4,6890              |
| 20                                                                                        | 2953                 | 3,9480              | 7786                 | 4,0852              | 2039                 | 3,9050              | 1738                 | 3,8540              | 3289                 | 4,0940              | 7584                 | 4,0980              |
| 30                                                                                        | 3391                 | 3,8675              | 6846                 | 4,0507              | 3584                 | 3,8675              | 3259                 | 3,8030              | 6044                 | 4,0467              | 8175                 | 4,0706              |
| 40                                                                                        | 4886                 | 3,8370              | 6369                 | 4,0217              | 5725                 | 3,8375              | 6030                 | 3,7785              | 5399                 | 4,0159              | 11534                | 4,0393              |
| 50                                                                                        | 6967                 | 3,8195              | 6498                 | 4,0013              | 6466                 | 3,8170              | 6379                 | 3,7595              | 6934                 | 3,9960              | 13246                | 4,0199              |
| 60                                                                                        | 8671                 | 3,8050              | 9640                 | 3,9875              | 7746                 | 3,8000              | 7161                 | 3,7440              | 7701                 | 3,9818              | 13990                | 4,0040              |
| 80                                                                                        | 8764                 | 3,7795              | 12007                | 3,9632              | 9820                 | 3,7800              | 11042                | 3,7290              | 13050                | 3,9633              | 11749                | 3,9755              |
| 100                                                                                       | 10132                | 3,7620              | 13364                | 3,9447              | 13752                | 3,7670              | 9843                 | 3,7105              | 15982                | 3,9477              | 12291                | 3,9534              |
| 120                                                                                       | 11388                | 3,7460              | 19662                | 3,9285              | 11489                | 3,7490              | 10984                | 3,6980              | 14537                | 3,9260              | 13098                | 3,9291              |
| 140                                                                                       | 12052                | 3,7315              | 18338                | 3,9032              | 12236                | 3,7345              | 13372                | 3,6830              | 18286                | 3,9073              | 13771                | 3,9024              |
| 160                                                                                       | 15263                | 3,7185              | 17569                | 3,8811              | 12395                | 3,7155              | 16544                | 3,6740              | 15135                | 3,8790              | 15133                | 3,8737              |
| 180                                                                                       | 14819                | 3,7015              | 14726                | 3,8419              | 13249                | 3,6940              | 17982                | 3,6525              | 16342                | 3,8523              | 14910                | 3,8406              |
| 200                                                                                       | 14991                | 3,6850              | 22188                | 3,8100              | 16410                | 3,6745              | 12889                | 3,6235              | 24769                | 3,8253              | 15921                | 3,8080              |
| 300                                                                                       | 17809                | 3,5920              | 28246                | 3,6625              | 16302                | 3,5415              | 15605                | 3,4970              | 19391                | 3,6691              | 16059                | 3,6367              |
| 400                                                                                       | 18345                | 3,4750              | 25356                | 3,5116              | 18925                | 3,3925              | 18535                | 3,3435              | 21330                | 3,5098              | 16614                | 3,4712              |
| 480                                                                                       | 18469                | 3,3730              | 25681                | 3,3762              | 20796                | 3,2455              | 19053                | 3,2050              | 25233                | 3,3619              | 16857                | 3,3265              |

Hinweis: Der Inhalt von grau gefärbten Zellen wurde nicht ermittelt bzw. ist nicht nötig