

# Hub dimensioning for the use of KBK locking devices

## Preliminary design of the hub

The hub material is stressed by the surface pressure on the hub (see also information in the technical data sheets). To prevent a slight separation / destruction of the hub by the locking device, the minimum outer diameter of the hub should be taken into consideration for the dimensioning. This depends on the material, mounting conditions and the surface pressure generated by the locking device.

When choosing the material it has to be ensured, that the surface pressure of the locking device on the hub must not exceed the yield strength  $R_{p0.2}$  of the hub material.

The following tables show multipliers (K) depending on the yield strength and the mounting conditions, by which the minimum outer diameter of the hub can be roughly determined.

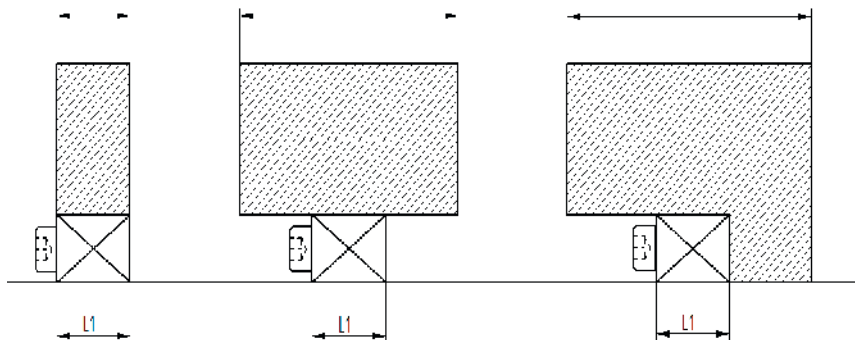
This rule applies:  $DN = D \times K$

(D = outer diameter of the locking device; K = installation factor)

$$B \geq L1 : X = 1$$

$$B \geq 2 \times L1 : X = 0,8$$

$$B > 2 \times L1 : X = 0,6$$



| Surface Pressure<br>[N/mm <sup>2</sup> ] | Stress<br>Reduction<br>Factor<br>X | Yield strength of the hub material (N/mm <sup>2</sup> ) |        |         |         |         |      |         |         |         |         |         |
|--|------------------------------------|---|--------|---------|---------|---------|------|---------|---------|---------|---------|---------|
|  |                                    | 150   | 180    | 200     | 220     | 250     | 270  | 300     | 350     | 400     | 450     | 600     |
|  |                                    | GJL-200   |        | GJL-250 | GJL-300 | GJS-400 |      | GJS-500 | GJS-600 | GJS-700 | GJS-800 |         |
|  |                                    |   |        |         | S235    | 11SMn30 | S275 |         | S355    |         | C45E    | 16MnCr5 |
|  |                                    | 1.4301  | 1.4401 |         | AW 2011 |         |      |         | AW 7075 |         |         |         |
| 60                                       | 0,6                                | 1,28  | 1,22   | 1,20    | 1,18    | 1,16    | 1,14 | 1,13    | 1,11    | 1,09    | 1,08    | 1,06    |
| 60                                       | 0,8                                | 1,39  | 1,31   | 1,28    | 1,25    | 1,21    | 1,20 | 1,18    | 1,15    | 1,13    | 1,11    | 1,08    |
| 60                                       | 1                                  | 1,53  | 1,41   | 1,36    | 1,32    | 1,28    | 1,25 | 1,22    | 1,19    | 1,16    | 1,14    | 1,11    |
| 65                                       | 0,6                                | 1,30  | 1,25   | 1,22    | 1,20    | 1,17    | 1,16 | 1,14    | 1,12    | 1,10    | 1,09    | 1,07    |
| 65                                       | 0,8                                | 1,44  | 1,35   | 1,30    | 1,27    | 1,24    | 1,22 | 1,19    | 1,16    | 1,14    | 1,12    | 1,09    |
| 65                                       | 1                                  | 1,59  | 1,46   | 1,40    | 1,36    | 1,30    | 1,28 | 1,25    | 1,21    | 1,18    | 1,16    | 1,11    |
| 70                                       | 0,6                                | 1,33  | 1,27   | 1,24    | 1,21    | 1,18    | 1,17 | 1,15    | 1,13    | 1,11    | 1,10    | 1,07    |
| 70                                       | 0,8                                | 1,48  | 1,38   | 1,33    | 1,30    | 1,26    | 1,23 | 1,21    | 1,18    | 1,15    | 1,13    | 1,10    |
| 70                                       | 1                                  | 1,66  | 1,51   | 1,44    | 1,39    | 1,33    | 1,30 | 1,27    | 1,22    | 1,19    | 1,17    | 1,12    |
| 75                                       | 0,6                                | 1,36  | 1,29   | 1,26    | 1,23    | 1,20    | 1,18 | 1,16    | 1,14    | 1,12    | 1,11    | 1,08    |
| 75                                       | 0,8                                | 1,53  | 1,41   | 1,36    | 1,32    | 1,28    | 1,25 | 1,22    | 1,19    | 1,16    | 1,14    | 1,11    |
| 75                                       | 1                                  | 1,73  | 1,56   | 1,48    | 1,43    | 1,36    | 1,33 | 1,29    | 1,24    | 1,21    | 1,18    | 1,13    |
| 80                                       | 0,6                                | 1,39  | 1,31   | 1,28    | 1,25    | 1,21    | 1,20 | 1,18    | 1,15    | 1,13    | 1,11    | 1,08    |
| 80                                       | 0,8                                | 1,58  | 1,45   | 1,39    | 1,35    | 1,30    | 1,27 | 1,24    | 1,20    | 1,18    | 1,15    | 1,11    |
| 80                                       | 1                                  | 1,81  | 1,61   | 1,53    | 1,46    | 1,39    | 1,36 | 1,31    | 1,26    | 1,22    | 1,20    | 1,14    |
| 90                                       | 0,6                                | 1,46  | 1,36   | 1,32    | 1,28    | 1,25    | 1,22 | 1,20    | 1,17    | 1,15    | 1,13    | 1,09    |
| 90                                       | 0,8                                | 1,69  | 1,53   | 1,46    | 1,40    | 1,34    | 1,31 | 1,28    | 1,23    | 1,20    | 1,18    | 1,13    |
| 90                                       | 1                                  | 2,00  | 1,73   | 1,62    | 1,54    | 1,46    | 1,41 | 1,36    | 1,30    | 1,26    | 1,22    | 1,16    |
| 95                                       | 0,6                                | 1,49  | 1,39   | 1,34    | 1,30    | 1,26    | 1,24 | 1,21    | 1,18    | 1,15    | 1,14    | 1,10    |
| 95                                       | 0,8                                | 1,75  | 1,57   | 1,49    | 1,43    | 1,37    | 1,34 | 1,30    | 1,25    | 1,21    | 1,19    | 1,14    |
| 95                                       | 1                                  | 2,11  | 1,80   | 1,68    | 1,59    | 1,49    | 1,44 | 1,39    | 1,32    | 1,27    | 1,24    | 1,17    |
| 100                                      | 0,6                                | 1,53  | 1,41   | 1,36    | 1,32    | 1,28    | 1,25 | 1,22    | 1,19    | 1,16    | 1,14    | 1,11    |
| 100                                      | 0,8                                | 1,81  | 1,61   | 1,53    | 1,46    | 1,39    | 1,36 | 1,31    | 1,26    | 1,22    | 1,20    | 1,14    |
| 100                                      | 1                                  | 2,24  | 1,87   | 1,73    | 1,63    | 1,53    | 1,48 | 1,41    | 1,34    | 1,29    | 1,25    | 1,18    |
| 105                                      | 0,6                                | 1,56  | 1,44   | 1,39    | 1,34    | 1,29    | 1,27 | 1,24    | 1,20    | 1,17    | 1,15    | 1,11    |
| 105                                      | 0,8                                | 1,88  | 1,66   | 1,56    | 1,50    | 1,42    | 1,38 | 1,33    | 1,28    | 1,24    | 1,21    | 1,15    |
| 105                                      | 1                                  | 2,38  | 1,95   | 1,79    | 1,68    | 1,56    | 1,51 | 1,44    | 1,36    | 1,31    | 1,27    | 1,19    |
| 110                                      | 0,6                                | 1,60  | 1,47   | 1,41    | 1,36    | 1,31    | 1,28 | 1,25    | 1,21    | 1,18    | 1,16    | 1,12    |
| 110                                      | 0,8                                | 1,96  | 1,71   | 1,60    | 1,53    | 1,44    | 1,40 | 1,35    | 1,29    | 1,25    | 1,22    | 1,16    |
| 110                                      | 1                                  | 2,55  | 2,04   | 1,86    | 1,73    | 1,60    | 1,54 | 1,47    | 1,38    | 1,33    | 1,28    | 1,20    |
| 115                                      | 0,6                                | 1,64  | 1,50   | 1,43    | 1,38    | 1,33    | 1,30 | 1,26    | 1,22    | 1,19    | 1,17    | 1,12    |
| 115                                      | 0,8                                | 2,04  | 1,76   | 1,64    | 1,56    | 1,47    | 1,43 | 1,37    | 1,31    | 1,26    | 1,23    | 1,17    |
| 115                                      | 1                                  | 2,75  | 2,13   | 1,93    | 1,79    | 1,64    | 1,58 | 1,50    | 1,41    | 1,34    | 1,30    | 1,21    |
| 120                                      | 0,6                                | 1,69  | 1,53   | 1,46    | 1,40    | 1,34    | 1,31 | 1,28    | 1,23    | 1,20    | 1,18    | 1,13    |
| 120                                      | 0,8                                | 2,13  | 1,81   | 1,69    | 1,60    | 1,50    | 1,45 | 1,39    | 1,33    | 1,28    | 1,24    | 1,18    |
| 120                                      | 1                                  | 3,00  | 2,24   | 2,00    | 1,84    | 1,69    | 1,61 | 1,53    | 1,43    | 1,36    | 1,31    | 1,22    |
| 125                                      | 0,6                                | 1,73  | 1,56   | 1,48    | 1,43    | 1,36    | 1,33 | 1,29    | 1,24    | 1,21    | 1,18    | 1,13    |
| 125                                      | 0,8                                | 2,24  | 1,87   | 1,73    | 1,63    | 1,53    | 1,48 | 1,41    | 1,34    | 1,29    | 1,25    | 1,18    |
| 125                                      | 1                                  | 3,32  | 2,35   | 2,08    | 1,91    | 1,73    | 1,65 | 1,56    | 1,45    | 1,38    | 1,33    | 1,24    |
| 130                                      | 0,6                                | 1,78  | 1,59   | 1,51    | 1,45    | 1,38    | 1,35 | 1,30    | 1,25    | 1,22    | 1,19    | 1,14    |
| 130                                      | 0,8                                | 2,35  | 1,93   | 1,78    | 1,67    | 1,56    | 1,50 | 1,44    | 1,36    | 1,30    | 1,27    | 1,19    |
| 130                                      | 1                                  | 3,74  | 2,49   | 2,17    | 1,97    | 1,78    | 1,69 | 1,59    | 1,48    | 1,40    | 1,35    | 1,25    |
| 135                                      | 0,6                                | 1,83  | 1,62   | 1,54    | 1,47    | 1,40    | 1,36 | 1,32    | 1,27    | 1,23    | 1,20    | 1,15    |
| 135                                      | 0,8                                | 2,48  | 2,00   | 1,83    | 1,71    | 1,59    | 1,53 | 1,46    | 1,38    | 1,32    | 1,28    | 1,20    |
| 135                                      | 1                                  | 4,36  | 2,65   | 2,27    | 2,04    | 1,83    | 1,73 | 1,62    | 1,50    | 1,42    | 1,36    | 1,26    |



The values as shown in the table are only a basis for the rough dimensioning of the outer diameter of the hub and are no warranty for the correct functioning.  
In case of any doubt, please contact our technical experts!

| Surface Pressure<br>[N/mm <sup>2</sup> ] | Stress<br>Reduction<br>Factor<br>X | Yield strength of the hub material (N/mm <sup>2</sup> ) |        |         |         |         |      |         |         |         |         |         |
|--|------------------------------------|---|--------|---------|---------|---------|------|---------|---------|---------|---------|---------|
|  |                                    | 150   | 180    | 200     | 220     | 250     | 270  | 300     | 350     | 400     | 450     | 600     |
|  |                                    | GJL-200   |        | GJL-250 | GJL-300 | GJS-400 |      | GJS-500 | GJS-600 | GJS-700 | GJS-800 |         |
|  |                                    |   |        |         | S235    | 11SMn30 | S275 |         | S355    |         | C45E    | 16MnCr5 |
|  |                                    | 1.4301  | 1.4401 |         | AW 2011 |         |      |         |         | AW 7075 |         |         |
| 140                                      | 0,6                                | 1,88  | 1,66   | 1,56    | 1,50    | 1,42    | 1,38 | 1,33    | 1,28    | 1,24    | 1,21    | 1,15    |
| 140                                      | 0,8                                | 2,63  | 2,07   | 1,88    | 1,75    | 1,62    | 1,55 | 1,48    | 1,39    | 1,33    | 1,29    | 1,21    |
| 140                                      | 1                                  | 5,39  | 2,83   | 2,38    | 2,12    | 1,88    | 1,78 | 1,66    | 1,53    | 1,44    | 1,38    | 1,27    |
| 145                                      | 0,6                                | 1,94  | 1,69   | 1,59    | 1,52    | 1,44    | 1,40 | 1,35    | 1,29    | 1,25    | 1,22    | 1,16    |
| 145                                      | 0,8                                | 2,80  | 2,15   | 1,94    | 1,80    | 1,65    | 1,58 | 1,50    | 1,41    | 1,35    | 1,30    | 1,22    |
| 145                                      | 1                                  | 7,68  | 3,05   | 2,50    | 2,21    | 1,94    | 1,82 | 1,69    | 1,55    | 1,46    | 1,40    | 1,28    |
| 150                                      | 0,6                                | 2,00  | 1,73   | 1,62    | 1,54    | 1,46    | 1,41 | 1,36    | 1,30    | 1,26    | 1,22    | 1,16    |
| 150                                      | 0,8                                | 3,00  | 2,24   | 2,00    | 1,84    | 1,69    | 1,61 | 1,53    | 1,43    | 1,36    | 1,31    | 1,22    |
| 150                                      | 1                                  | -   | 3,32   | 2,65    | 2,30    | 2,00    | 1,87 | 1,73    | 1,58    | 1,48    | 1,41    | 1,29    |
| 155                                      | 0,6                                | 2,06  | 1,77   | 1,65    | 1,57    | 1,48    | 1,43 | 1,38    | 1,31    | 1,27    | 1,23    | 1,17    |
| 155                                      | 0,8                                | 3,25  | 2,33   | 2,06    | 1,89    | 1,72    | 1,64 | 1,55    | 1,45    | 1,38    | 1,33    | 1,23    |
| 155                                      | 1                                  | -   | 3,66   | 2,81    | 2,40    | 2,06    | 1,92 | 1,77    | 1,61    | 1,51    | 1,43    | 1,30    |
| 160                                      | 0,6                                | 2,13  | 1,81   | 1,69    | 1,60    | 1,50    | 1,45 | 1,39    | 1,33    | 1,28    | 1,24    | 1,18    |
| 160                                      | 0,8                                | 3,55  | 2,43   | 2,13    | 1,94    | 1,76    | 1,67 | 1,58    | 1,47    | 1,39    | 1,34    | 1,24    |
| 160                                      | 1                                  | -   | 4,12   | 3,00    | 2,52    | 2,13    | 1,98 | 1,81    | 1,64    | 1,53    | 1,45    | 1,31    |
| 165                                      | 0,6                                | 2,21  | 1,86   | 1,72    | 1,62    | 1,52    | 1,47 | 1,41    | 1,34    | 1,29    | 1,25    | 1,18    |
| 165                                      | 0,8                                | 3,96  | 2,55   | 2,21    | 2,00    | 1,80    | 1,71 | 1,60    | 1,49    | 1,41    | 1,35    | 1,25    |
| 165                                      | 1                                  | -   | 4,80   | 3,23    | 2,65    | 2,21    | 2,04 | 1,86    | 1,67    | 1,55    | 1,47    | 1,33    |
| 170                                      | 0,6                                | 2,29  | 1,90   | 1,76    | 1,65    | 1,54    | 1,49 | 1,42    | 1,35    | 1,30    | 1,26    | 1,19    |
| 170                                      | 0,8                                | 4,52  | 2,68   | 2,29    | 2,06    | 1,84    | 1,74 | 1,63    | 1,51    | 1,42    | 1,37    | 1,26    |
| 170                                      | 1                                  | -   | 5,92   | 3,51    | 2,79    | 2,29    | 2,10 | 1,90    | 1,70    | 1,57    | 1,49    | 1,34    |
| 175                                      | 0,6                                | 2,38  | 1,95   | 1,79    | 1,68    | 1,56    | 1,51 | 1,44    | 1,36    | 1,31    | 1,27    | 1,19    |
| 175                                      | 0,8                                | 5,39  | 2,83   | 2,38    | 2,12    | 1,88    | 1,78 | 1,66    | 1,53    | 1,44    | 1,38    | 1,27    |
| 175                                      | 1                                  | -   | 8,43   | 3,87    | 2,96    | 2,38    | 2,16 | 1,95    | 1,73    | 1,60    | 1,51    | 1,35    |
| 180                                      | 0,6                                | 2,48  | 2,00   | 1,83    | 1,71    | 1,59    | 1,53 | 1,46    | 1,38    | 1,32    | 1,28    | 1,20    |
| 180                                      | 0,8                                | 7,00  | 3,00   | 2,48    | 2,19    | 1,93    | 1,81 | 1,69    | 1,55    | 1,46    | 1,39    | 1,28    |
| 180                                      | 1                                  | -   | -      | 4,36    | 3,16    | 2,48    | 2,24 | 2,00    | 1,77    | 1,62    | 1,53    | 1,36    |
| 185                                      | 0,6                                | 2,59  | 2,05   | 1,87    | 1,74    | 1,61    | 1,55 | 1,47    | 1,39    | 1,33    | 1,29    | 1,21    |
| 185                                      | 0,8                                | 12,21   | 3,20   | 2,59    | 2,26    | 1,98    | 1,85 | 1,72    | 1,57    | 1,47    | 1,41    | 1,29    |
| 185                                      | 1                                  | -   | -      | 5,07    | 3,40    | 2,59    | 2,31 | 2,05    | 1,80    | 1,65    | 1,55    | 1,38    |
| 190                                      | 0,6                                | 2,71  | 2,11   | 1,91    | 1,78    | 1,64    | 1,57 | 1,49    | 1,40    | 1,34    | 1,30    | 1,21    |
| 190                                      | 0,8                                | -   | 3,44   | 2,71    | 2,34    | 2,03    | 1,89 | 1,75    | 1,59    | 1,49    | 1,42    | 1,30    |
| 190                                      | 1                                  | -   | -      | 6,24    | 3,70    | 2,71    | 2,40 | 2,11    | 1,84    | 1,68    | 1,57    | 1,39    |
| 195                                      | 0,6                                | 2,84  | 2,17   | 1,95    | 1,81    | 1,66    | 1,59 | 1,51    | 1,42    | 1,35    | 1,30    | 1,22    |
| 195                                      | 0,8                                | -   | 3,74   | 2,84    | 2,42    | 2,08    | 1,93 | 1,78    | 1,62    | 1,51    | 1,44    | 1,30    |
| 195                                      | 1                                  | -   | -      | 8,89    | 4,07    | 2,84    | 2,49 | 2,17    | 1,88    | 1,70    | 1,59    | 1,40    |
| 200                                      | 0,6                                | 3,00  | 2,24   | 2,00    | 1,84    | 1,69    | 1,61 | 1,53    | 1,43    | 1,36    | 1,31    | 1,22    |
| 200                                      | 0,8                                | -   | 4,12   | 3,00    | 2,52    | 2,13    | 1,98 | 1,81    | 1,64    | 1,53    | 1,45    | 1,31    |
| 200                                      | 1                                  | -   | -      | -       | 4,58    | 3,00    | 2,59 | 2,24    | 1,91    | 1,73    | 1,61    | 1,41    |



The values as shown in the table are only a basis for the rough dimensioning of the outer diameter of the hub and are no warranty for the correct functioning. In case of any doubt, please contact our technical experts!