



Berechnung der Druck- und Zugkraft von Hydraulikzylindern

1000 daN = 10 kN = 1 t

| Ø mm    |        | Nutzbare Fläche<br>cm <sup>2</sup> |                  | Druck-, Zugkraft in Kg bei . . . bar |      |         |      |         |      |         |      |         |       |
|---------|--------|------------------------------------|------------------|--------------------------------------|------|---------|------|---------|------|---------|------|---------|-------|
|         |        |                                    |                  | 100 bar                              |      | 150 bar |      | 175 bar |      | 200 bar |      | 250 bar |       |
| Bohrung | Stange | Boden<br>seite                     | Stangen<br>seite | Aus                                  | Ein  | Aus     | Ein  | Aus     | Ein  | Aus     | Ein  | Aus     | Ein   |
| -       | 20     | 3,14                               | -                | 314                                  | -    | 471     | -    | 550     | -    | 628     | -    | 785     | -     |
| 25      | 16     | 4,91                               | 2,90             | 491                                  | 290  | 737     | 435  | 859     | 508  | 982     | 580  | 1228    | 725   |
| 30      | 16     | 7,07                               | 5,06             | 707                                  | 506  | 1060    | 758  | 1236    | 885  | 1413    | 1011 | 1766    | 1264  |
|         | 20     |                                    | 3,93             |                                      | 393  |         | 590  |         | 688  |         | 786  |         | 983   |
| 32      | 16     | 8,04                               | 6,03             | 804                                  | 803  | 1206    | 904  | 1407    | 1055 | 1608    | 1206 | 2010    | 1507  |
|         | 20     |                                    | 4,90             |                                      | 490  |         | 735  |         | 857  |         | 980  |         | 1225  |
| 35      | 20     | 9,62                               | 6,48             | 962                                  | 647  | 1442    | 971  | 1683    | 1133 | 1923    | 1295 | 2404    | 1619  |
|         | 22     |                                    | 5,82             |                                      | 581  |         | 872  |         | 1018 |         | 1163 |         | 1454  |
| 40      | 20     | 12,57                              | 9,43             | 1257                                 | 943  | 1886    | 1415 | 2200    | 1650 | 2514    | 1886 | 3143    | 2358  |
|         | 25     |                                    | 7,66             |                                      | 766  |         | 1149 |         | 1341 |         | 1532 |         | 1915  |
| 45      | 22     | 15,90                              | 12,10            | 1590                                 | 1210 | 2384    | 1815 | 2782    | 2117 | 3179    | 2419 | 3974    | 3024  |
|         | 25     |                                    | 10,99            |                                      | 1099 |         | 1649 |         | 1923 |         | 2198 |         | 2748  |
|         | 30     |                                    | 8,83             |                                      | 883  |         | 1325 |         | 1545 |         | 1766 |         | 2208  |
| 50      | 20     | 19,63                              | 16,49            | 1963                                 | 1649 | 2945    | 2473 | 3435    | 2885 | 3926    | 3297 | 4908    | 4121  |
|         | 25     |                                    | 14,72            |                                      | 1472 |         | 2208 |         | 2576 |         | 2944 |         | 3680  |
|         | 30     |                                    | 12,57            |                                      | 1257 |         | 1886 |         | 2200 |         | 2514 |         | 3143  |
|         | 35     |                                    | 10,01            |                                      | 1001 |         | 1502 |         | 1752 |         | 2002 |         | 2503  |
| 55      | 25     | 23,75                              | 18,84            | 2375                                 | 1884 | 3562    | 2826 | 1456    | 3297 | 4749    | 3768 | 5937    | 4710  |
|         | 30     |                                    | 16,68            |                                      | 1668 |         | 2502 |         | 2919 |         | 3336 |         | 4170  |
|         | 35     |                                    | 14,13            |                                      | 1413 |         | 2120 |         | 2473 |         | 2826 |         | 3533  |
| 60      | 30     | 28,27                              | 21,21            | 2827                                 | 2121 | 4241    | 3182 | 4947    | 3712 | 5654    | 4242 | 7068    | 5303  |
|         | 35     |                                    | 18,65            |                                      | 1865 |         | 2798 |         | 3264 |         | 3730 |         | 4663  |
|         | 40     |                                    | 15,71            |                                      | 1571 |         | 2357 |         | 2749 |         | 3142 |         | 3928  |
| 63      | 30     | 31,16                              | 24,09            | 3116                                 | 2409 | 4674    | 3614 | 5452    | 4216 | 6231    | 4818 | 7789    | 6023  |
|         | 35     |                                    | 21,54            |                                      | 2154 |         | 3231 |         | 3770 |         | 4308 |         | 5385  |
|         | 40     |                                    | 18,60            |                                      | 1860 |         | 2790 |         | 3254 |         | 3719 |         | 4649  |
| 65      | 30     | 33,17                              | 26,10            | 3317                                 | 2610 | 4975    | 3915 | 5804    | 4568 | 6633    | 5220 | 8292    | 6525  |
|         | 35     |                                    | 23,55            |                                      | 2355 |         | 3533 |         | 4121 |         | 4710 |         | 5888  |
|         | 40     |                                    | 20,61            |                                      | 2061 |         | 3091 |         | 3606 |         | 4121 |         | 5152  |
|         | 45     |                                    | 17,27            |                                      | 1727 |         | 2591 |         | 3022 |         | 3454 |         | 4318  |
| 70      | 25     | 38,48                              | 33,56            | 3848                                 | 3356 | 5772    | 5034 | 6734    | 5873 | 7696    | 6712 | 9620    | 8390  |
|         | 30     |                                    | 31,40            |                                      | 3140 |         | 4710 |         | 5495 |         | 6280 |         | 7850  |
|         | 35     |                                    | 28,86            |                                      | 2886 |         | 4329 |         | 5051 |         | 5772 |         | 7215  |
|         | 40     |                                    | 25,92            |                                      | 2592 |         | 3888 |         | 4536 |         | 5184 |         | 6480  |
|         | 45     |                                    | 22,58            |                                      | 2258 |         | 3387 |         | 3952 |         | 4516 |         | 5645  |
| 50      | 18,84  | 1884                               | 2826             | 3297                                 | 3768 | 4710    |      |         |      |         |      |         |       |
| 75      | 30     | 44,16                              | 37,09            | 4416                                 | 3709 | 6623    | 5564 | 7727    | 6491 | 8831    | 7418 | 11039   | 9273  |
|         | 35     |                                    | 34,54            |                                      | 3454 |         | 5181 |         | 6045 |         | 6908 |         | 8635  |
|         | 40     |                                    | 31,60            |                                      | 3160 |         | 4739 |         | 5529 |         | 6319 |         | 7899  |
|         | 45     |                                    | 28,26            |                                      | 2826 |         | 4239 |         | 4946 |         | 5652 |         | 7065  |
| 80      | 35     | 50,27                              | 40,64            | 5027                                 | 4064 | 7541    | 6096 | 8797    | 7112 | 10054   | 8128 | 12568   | 10160 |
|         | 40     |                                    | 37,70            |                                      | 3770 |         | 5655 |         | 6598 |         | 7540 |         | 9425  |
|         | 45     |                                    | 34,36            |                                      | 3436 |         | 5154 |         | 6013 |         | 6872 |         | 8590  |
|         | 50     |                                    | 30,63            |                                      | 3063 |         | 4595 |         | 5360 |         | 6126 |         | 7658  |
| 60      | 21,99  | 2199                               | 3299             | 3848                                 | 4398 | 5498    |      |         |      |         |      |         |       |
| 85      | 35     | 56,72                              | 47,10            | 5672                                 | 4710 | 8507    | 7065 | 9925    | 8243 | 11343   | 9420 | 14179   | 11775 |
|         | 40     |                                    | 44,16            |                                      | 4416 |         | 6623 |         | 7727 |         | 8831 |         | 11039 |
|         | 45     |                                    | 40,82            |                                      | 4082 |         | 6123 |         | 7144 |         | 8164 |         | 10205 |
|         | 50     |                                    | 37,09            |                                      | 3709 |         | 5564 |         | 6491 |         | 7418 |         | 9273  |



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|------|-----------------|--------|--------------------------------------|------------------|---------|-------|---------|-------|---------|-------|---------|--------|---------|--------|
|      | Bohrung         | Stange | cm <sup>2</sup>                      |                  | 100 bar |       | 150 bar |       | 175 bar |       | 200 bar |        | 250 bar |        |
|      |                 |        | Boden<br>seite                       | Stangen<br>seite | Aus     | Ein   | Aus     | Ein   | Aus     | Ein   | Aus     | Ein    | Aus     | Ein    |
| 90   | 40              |        | 51,05                                |                  |         | 5105  |         | 7658  |         | 8934  |         | 10210  |         | 12763  |
|      | 45              |        | 47,71                                |                  |         | 4771  |         | 7157  |         | 8349  |         | 9542   |         | 11928  |
|      | 50              | 63,62  | 43,98                                |                  | 6362    | 4398  | 9543    | 6597  | 11134   | 7697  | 12724   | 8796   | 15905   | 10995  |
|      | 55              |        | 39,86                                |                  |         | 3986  |         | 5979  |         | 6976  |         | 7972   |         | 9965   |
|      | 60              |        | 35,34                                |                  |         | 3534  |         | 5301  |         | 6185  |         | 7068   |         | 8835   |
| 100  | 40              |        | 65,97                                |                  |         | 6597  |         | 9896  |         | 11545 |         | 13194  |         | 16493  |
|      | 45              |        | 62,64                                |                  |         | 6264  |         | 9396  |         | 10962 |         | 12528  |         | 15660  |
|      | 50              | 78,54  | 58,90                                |                  | 7854    | 5890  | 11781   | 8835  | 13745   | 10308 | 15708   | 11780  | 19635   | 14725  |
|      | 60              |        | 50,27                                |                  |         | 5027  |         | 7541  |         | 8797  |         | 10054  |         | 12568  |
|      | 70              |        | 40,06                                |                  |         | 4006  |         | 6009  |         | 7011  |         | 8012   |         | 10015  |
| 110  | 45              |        | 79,13                                |                  |         | 7913  |         | 11870 |         | 13848 |         | 15826  |         | 19783  |
|      | 50              | 95,03  | 75,40                                |                  | 9503    | 7540  | 14255   | 11310 | 16630   | 13195 | 19006   | 15080  | 23758   | 18850  |
|      | 60              |        | 66,76                                |                  |         | 6676  |         | 10014 |         | 11683 |         | 13352  |         | 16690  |
|      | 70              |        | 56,55                                |                  |         | 5655  |         | 8483  |         | 9896  |         | 11310  |         | 14138  |
| 120  | 50              |        | 93,46                                |                  |         | 9346  |         | 14019 |         | 16356 |         | 18692  |         | 23365  |
|      | 60              | 113,10 | 84,82                                |                  | 11310   | 8482  | 16965   | 12723 | 19793   | 14844 | 22620   | 16964  | 28275   | 21205  |
|      | 70              |        | 74,61                                |                  |         | 7461  |         | 11192 |         | 13057 |         | 14922  |         | 18653  |
|      | 80              |        | 62,83                                |                  |         | 6283  |         | 9425  |         | 10995 |         | 12566  |         | 15708  |
| 125  | 60              |        | 94,40                                |                  |         | 9440  |         | 14159 |         | 16519 |         | 18879  |         | 23599  |
|      | 70              | 122,66 | 84,19                                |                  | 12266   | 8419  | 18398   | 12629 | 21465   | 14733 | 24531   | 16838  | 30664   | 21048  |
|      | 80              |        | 72,42                                |                  |         | 7242  |         | 10862 |         | 12673 |         | 14483  |         | 18104  |
|      | 90              |        | 59,07                                |                  |         | 5907  |         | 8861  |         | 10337 |         | 11814  |         | 14768  |
| 130  | 50              |        | 113,10                               |                  |         | 11310 |         | 16965 |         | 19793 |         | 22620  |         | 28275  |
|      | 60              | 132,73 | 104,46                               |                  | 13273   | 20446 | 19910   | 15669 | 23228   | 18281 | 26546   | 20892  | 33183   | 26115  |
|      | 70              |        | 94,25                                |                  |         | 9425  |         | 14138 |         | 16494 |         | 18850  |         | 23563  |
|      | 80              |        | 82,47                                |                  |         | 8247  |         | 12371 |         | 14432 |         | 16494  |         | 20618  |
| 140  | 60              |        | 125,66                               |                  |         | 12566 |         | 18849 |         | 21991 |         | 25132  |         | 31415  |
|      | 70              | 153,94 | 115,45                               |                  | 15394   | 11545 | 23091   | 17318 | 26940   | 20204 | 30788   | 23090  | 38485   | 28863  |
|      | 80              |        | 103,67                               |                  |         | 10367 |         | 15551 |         | 18142 |         | 20734  |         | 25918  |
|      | 90              |        | 90,32                                |                  |         | 9032  |         | 13548 |         | 15806 |         | 18064  |         | 22580  |
| 150  | 60              |        | 148,44                               |                  |         | 14844 |         | 22266 |         | 25977 |         | 29688  |         | 37110  |
|      | 70              | 176,71 | 138,23                               |                  | 17671   | 13823 | 26507   | 20735 | 30924   | 24190 | 35342   | 27646  | 44178   | 34558  |
|      | 80              |        | 126,45                               |                  |         | 12645 |         | 18968 |         | 22129 |         | 25290  |         | 31613  |
|      | 90              |        | 113,10                               |                  |         | 11310 |         | 16965 |         | 19793 |         | 22620  |         | 28275  |
| 160  | 80              | 200,96 | 150,72                               |                  | 20096   | 15072 | 30144   | 22608 | 35168   | 26376 | 40192   | 30144  | 50240   | 37680  |
|      | 90              |        | 137,38                               |                  |         | 13738 |         | 20606 |         | 24041 |         | 27475  |         | 34344  |
| 180  | 100             | 254,34 | 175,84                               |                  | 25434   | 17584 | 38151   | 26376 | 44510   | 30772 | 50868   | 35168  | 63585   | 43960  |
|      | 120             |        | 141,30                               |                  |         | 14130 |         | 21195 |         | 24728 |         | 28260  |         | 35325  |
| 200  | 100             | 314,00 | 235,50                               |                  | 31400   | 23550 | 47100   | 35325 | 54950   | 41213 | 62800   | 47100  | 78500   | 58875  |
|      | 120             |        | 200,96                               |                  |         | 20096 |         | 30144 |         | 35168 |         | 40192  |         | 50240  |
| 250  | 120             | 490,63 | 377,59                               |                  | 49063   | 37759 | 73594   | 56638 | 85859   | 66077 | 98125   | 75517  | 122656  | 94396  |
|      | 150             |        | 314,00                               |                  |         | 31400 |         | 47100 |         | 54950 |         | 62800  |         | 78500  |
| 300  | 150             | 706,50 | 529,88                               |                  | 70650   | 52988 | 105975  | 79481 | 123638  | 92728 | 141300  | 105975 | 176625  | 132469 |
|      | 180             |        | 452,16                               |                  |         | 45216 |         | 67824 |         | 79128 |         | 90432  |         | 113040 |