

2022 年度建築基礎設計士一次試験 実技試問題参考資料

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設計資料

PHCパイルの断面諸元

| 外径 D (mm) | 厚さ t (mm) | 区分 | 断面積 Ac $\times 10^2$ (mm ²) | 換算断面積 Ae $\times 10^2$ (mm ²) | 断面一次 モーメント So $\times 10^3$ (mm ³) | 断面二次 モーメント Ic $\times 10^6$ (mm ⁴) | 換算断面 一次モーメント Ie $\times 10^6$ (mm ⁴) |
|-----------------|-----------------|----|--|--|--|--|--|
| 300 | 60 | A | 452 | 462 | 1,764 | 346.1 | 352.7 |
| | | B | | 470 | | | 359.0 |
| | | C | | 476 | | | 363.4 |
| 400 | 65 | A | 684 | 699 | 3,693 | 995.8 | 1,017 |
| | | B | | 710 | | | 1,031 |
| | | C | | 720 | | | 1,045 |
| 450 | 70 | A | 836 | 854 | 5,111 | 1,560 | 1,592 |
| | | B | | 872 | | | 1,624 |
| | | C | | 880 | | | 1,639 |
| 500 | 80 | A | 1,056 | 1,076 | 7,141 | 2,412 | 2,459 |
| | | B | | 1,097 | | | 2,507 |
| | | C | | 1,112 | | | 2,541 |
| 600 | 90 | A | 1,442 | 1,470 | 11,830 | 4,834 | 4,928 |
| | | B | | 1,498 | | | 5,025 |
| | | C | | 1,517 | | | 5,089 |
| 700 | 100 | A | 1,885 | 1,922 | 18,170 | 8,718 | 8,890 |
| | | B | | 1,964 | | | 9,086 |
| | | C | | 1,989 | | | 9,202 |
| 800 | 110 | A | 2,384 | 2,434 | 26,410 | 14,550 | 14,850 |
| | | B | | 2,485 | | | 15,170 |
| | | C | | 2,512 | | | 15,340 |
| 900 | 120 | A | 2,941 | 3,002 | 36,790 | 22,890 | 23,370 |
| | | B | | 3,080 | | | 23,820 |
| | | C | | 3,093 | | | 24,080 |
| 1,000 | 130 | A | 3,553 | 3,625 | 49,560 | 34,370 | 35,080 |
| | | B | | 3,697 | | | 35,760 |
| | | C | | 3,737 | | | 36,150 |

GPRCパイルの断面諸元

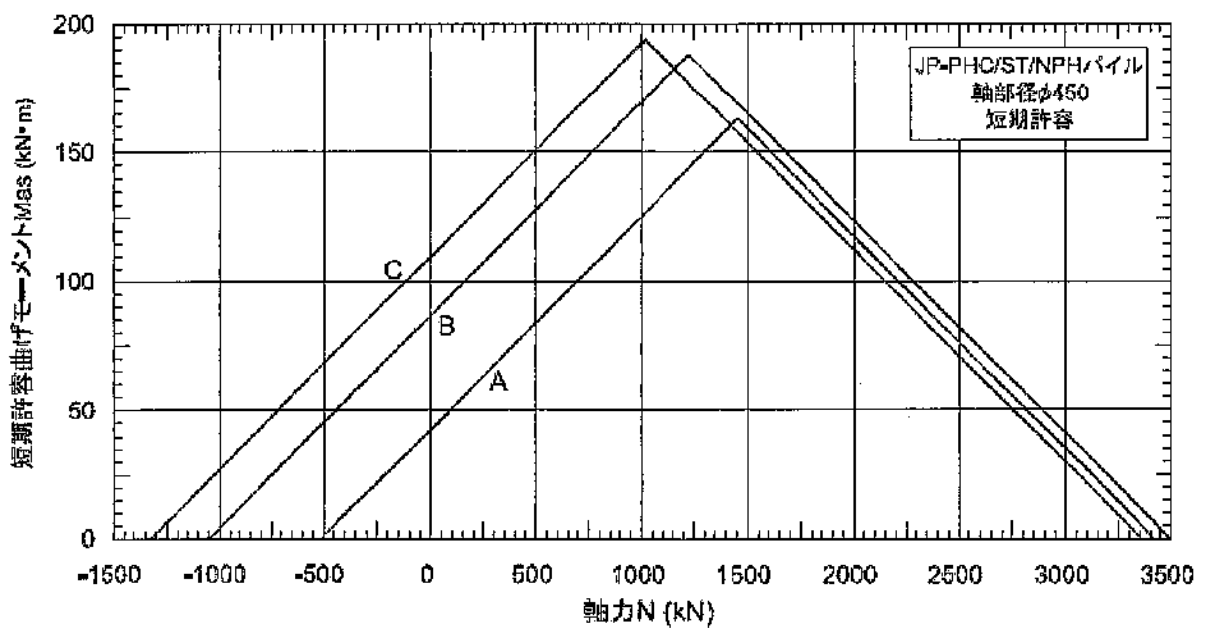
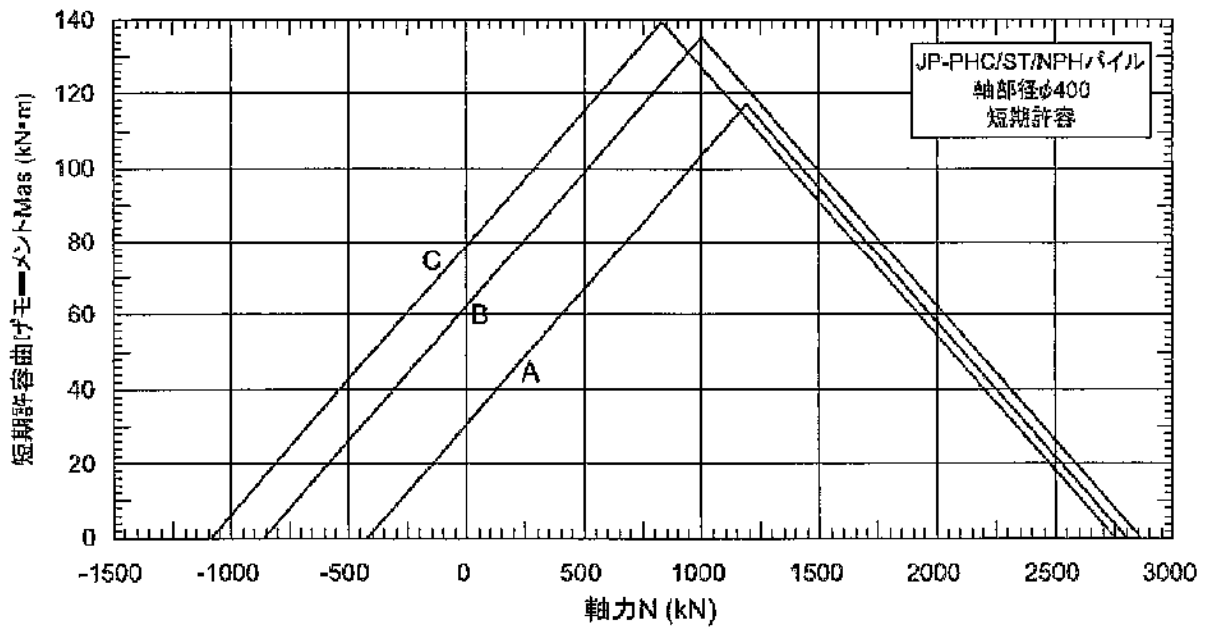
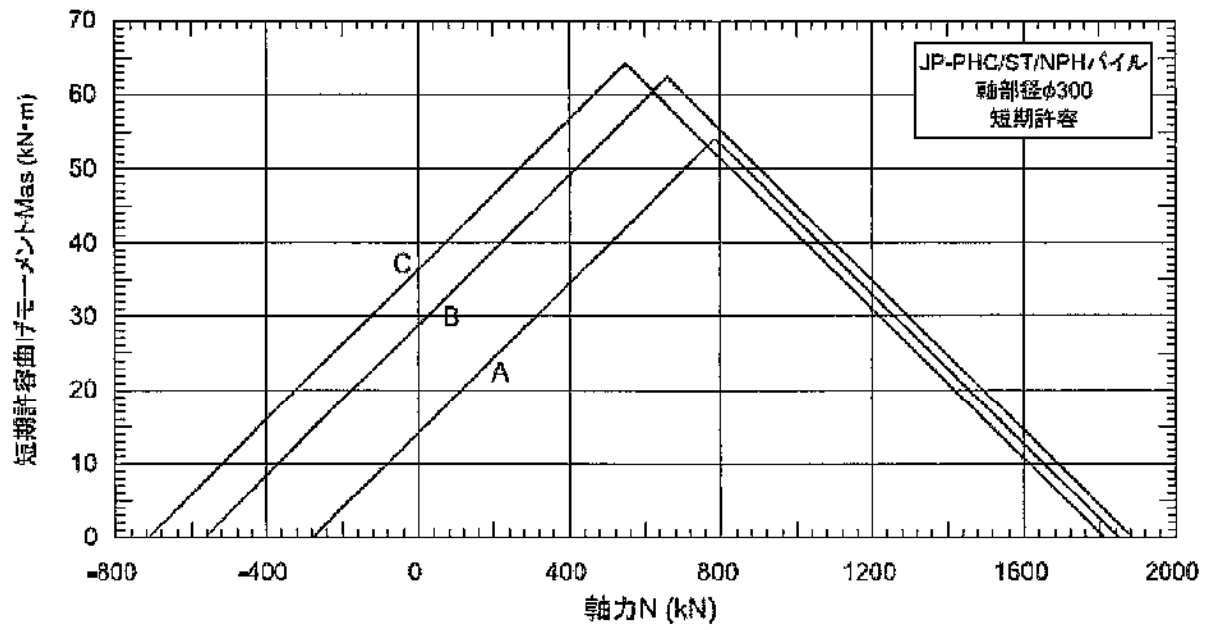
| 外径 D (mm) | 厚さ t (mm) | 区分 | 断面積 Ac $\times 10^2$ (mm ²) | 換算断面積 Ae $\times 10^2$ (mm ²) | 断面一次 モーメント So $\times 10^3$ (mm ³) | 断面二次 モーメント Ic $\times 10^6$ (mm ⁴) | 換算断面 一次モーメント Ie $\times 10^6$ (mm ⁴) |
|-----------------|-----------------|-----|--|--|--|--|--|
| 300 | 60 | I | 452 | 502 | 1,764 | 346.1 | 381.1 |
| | | II | | 519 | | | 392.4 |
| | | III | | 540 | | | 405.6 |
| | | IV | | 564 | | | 420.1 |
| 400 | 65 | I | 684 | 750 | 3,693 | 995.8 | 1,084 |
| | | II | | 773 | | | 1,114 |
| | | III | | 801 | | | 1,148 |
| | | IV | | 833 | | | 1,187 |
| 450 | 70 | I | 836 | 918 | 5,111 | 1,560 | 1,707 |
| | | II | | 947 | | | 1,756 |
| | | III | | 982 | | | 1,814 |
| | | IV | | 1,022 | | | 1,879 |
| 500 | 80 | I | 1,056 | 1,154 | 7,141 | 2,412 | 2,628 |
| | | II | | 1,189 | | | 2,700 |
| | | III | | 1,231 | | | 2,786 |
| | | IV | | 1,279 | | | 2,882 |
| 600 | 90 | I | 1,442 | 1,573 | 11,830 | 4,834 | 5,259 |
| | | II | | 1,619 | | | 5,402 |
| | | III | | 1,676 | | | 5,574 |
| | | IV | | 1,740 | | | 5,766 |
| 700 | 100 | I | 1,885 | 2,030 | 18,170 | 8,718 | 9,369 |
| | | II | | 2,073 | | | 9,544 |
| | | III | | 2,132 | | | 9,810 |
| | | IV | | 2,197 | | | 10,081 |
| | | V | | 2,273 | | | 10,399 |
| | | VI | | 2,360 | | | 10,752 |
| 800 | 110 | I | 2,384 | 2,548 | 26,410 | 14,550 | 15,521 |
| | | II | | 2,596 | | | 15,784 |
| | | III | | 2,663 | | | 16,181 |
| | | IV | | 2,735 | | | 16,587 |
| | | V | | 2,821 | | | 17,064 |
| | | VI | | 2,919 | | | 17,598 |

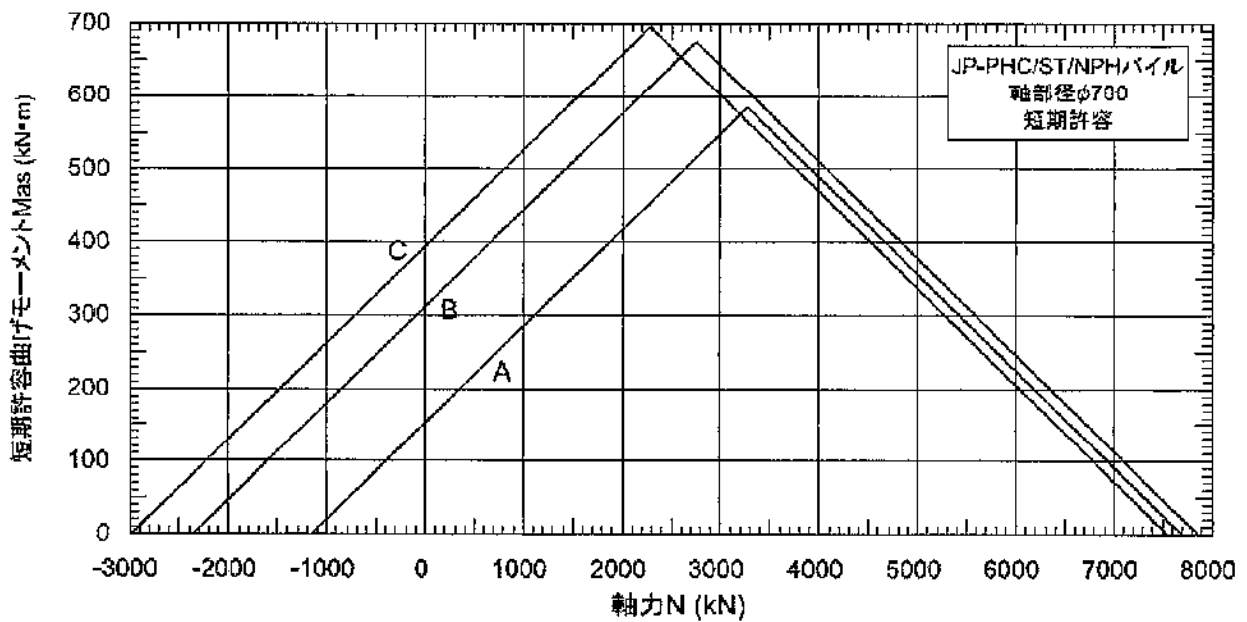
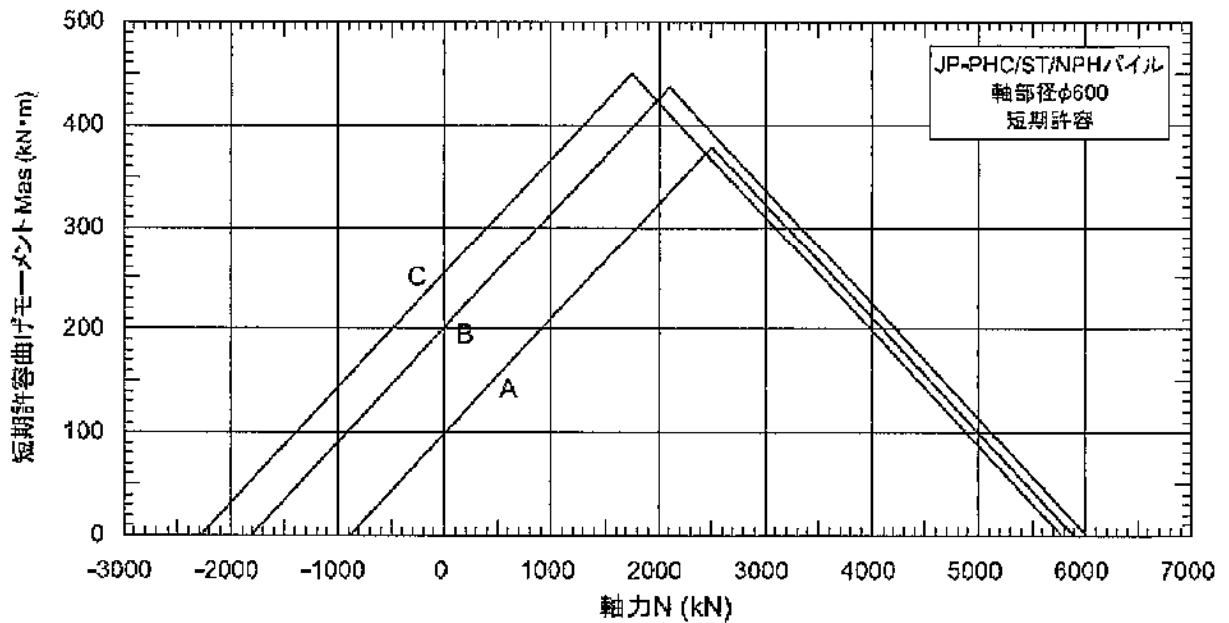
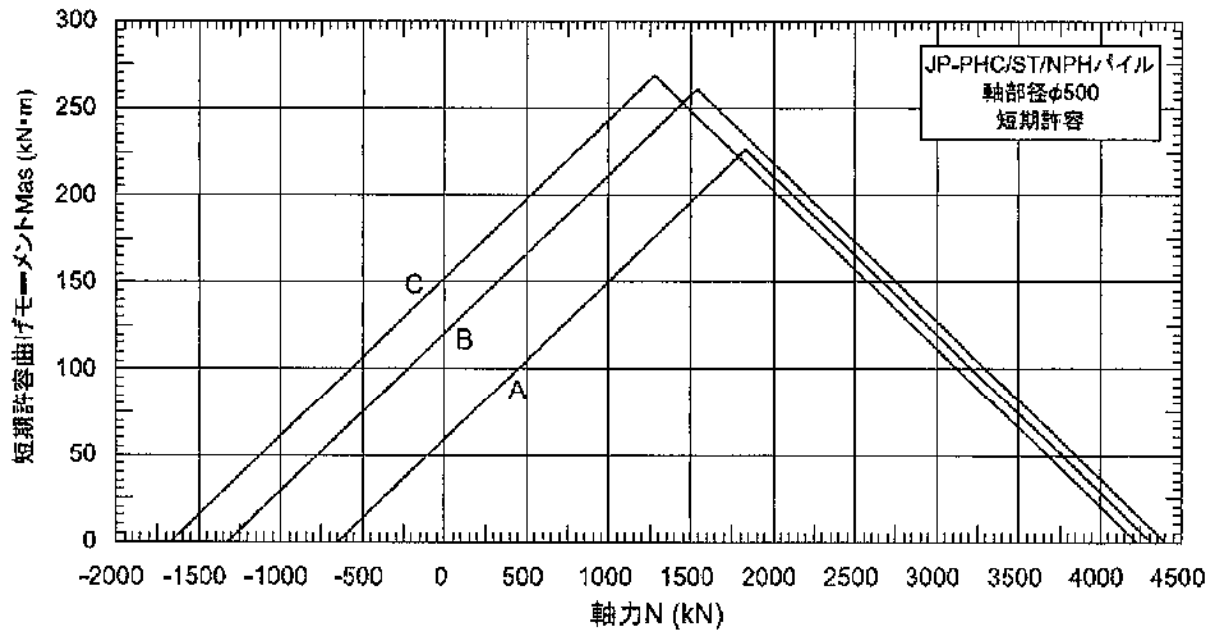
| | | | | | | | |
|-------|-----|-----|-------|-------|--------|--------|--------|
| 900 | 120 | I | 2,941 | 3,122 | 36,790 | 22,890 | 24,269 |
| | | II | | 3,175 | | | 24,846 |
| | | III | | 3,250 | | | 25,210 |
| | | IV | | 3,330 | | | 25,792 |
| | | V | | 3,426 | | | 26,475 |
| | | VI | | 3,534 | | | 27,240 |
| 1,000 | 130 | I | 3,553 | 3,771 | 49,560 | 34,370 | 36,424 |
| | | II | | 3,835 | | | 36,991 |
| | | III | | 3,924 | | | 37,833 |
| | | IV | | 4,021 | | | 38,706 |
| | | V | | 4,136 | | | 39,733 |
| | | VI | | 4,266 | | | 40,884 |

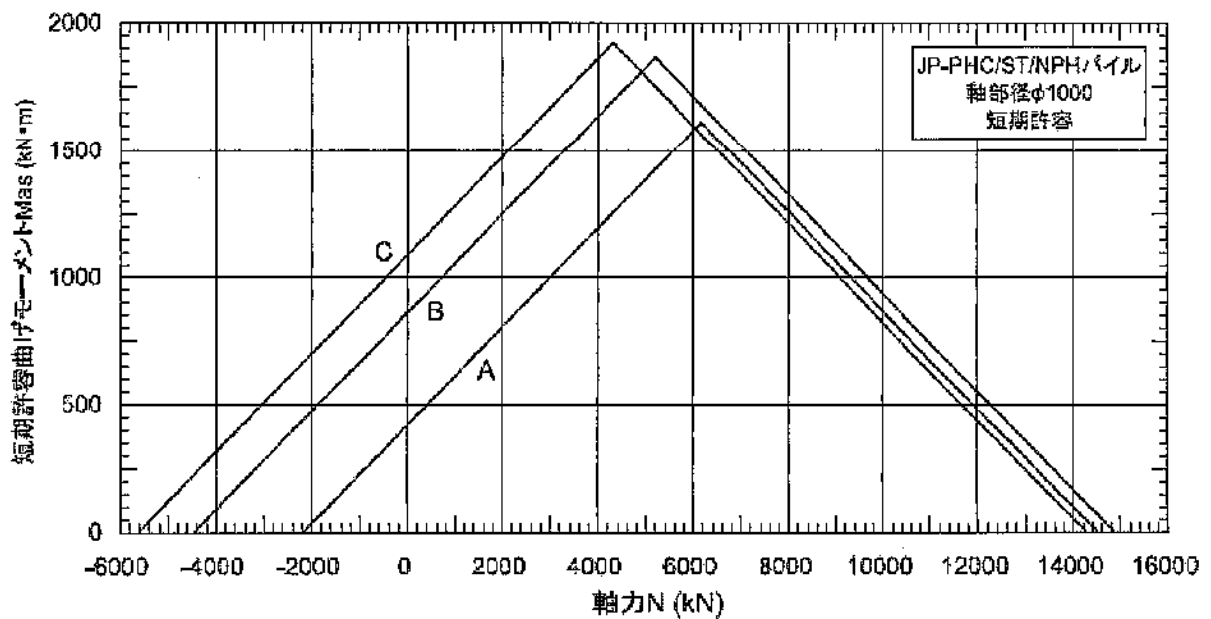
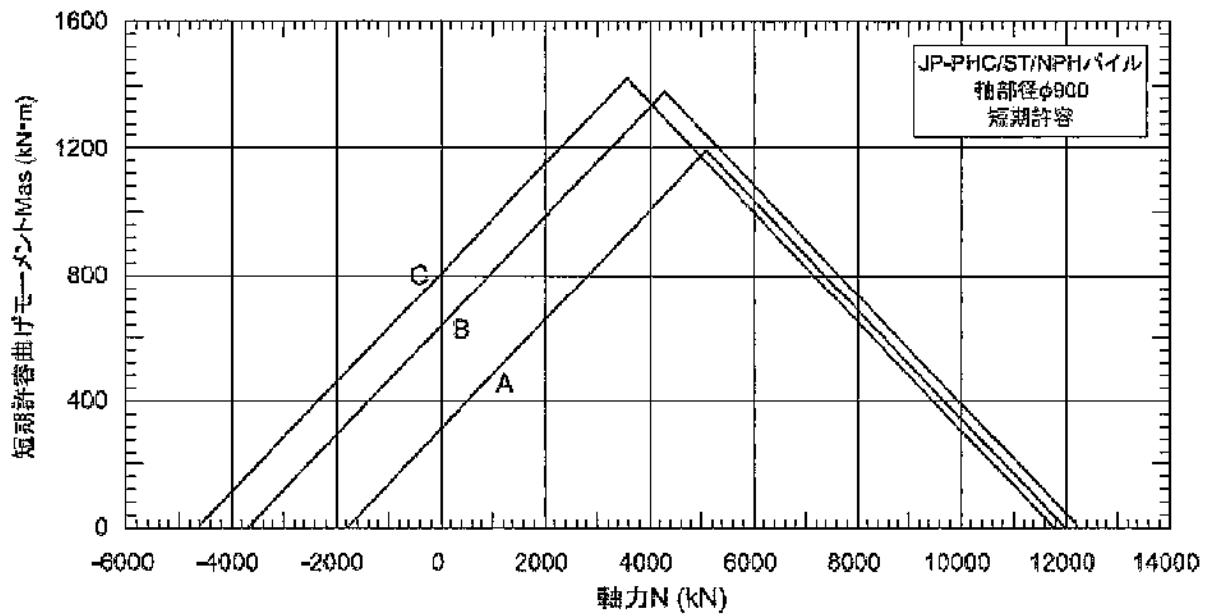
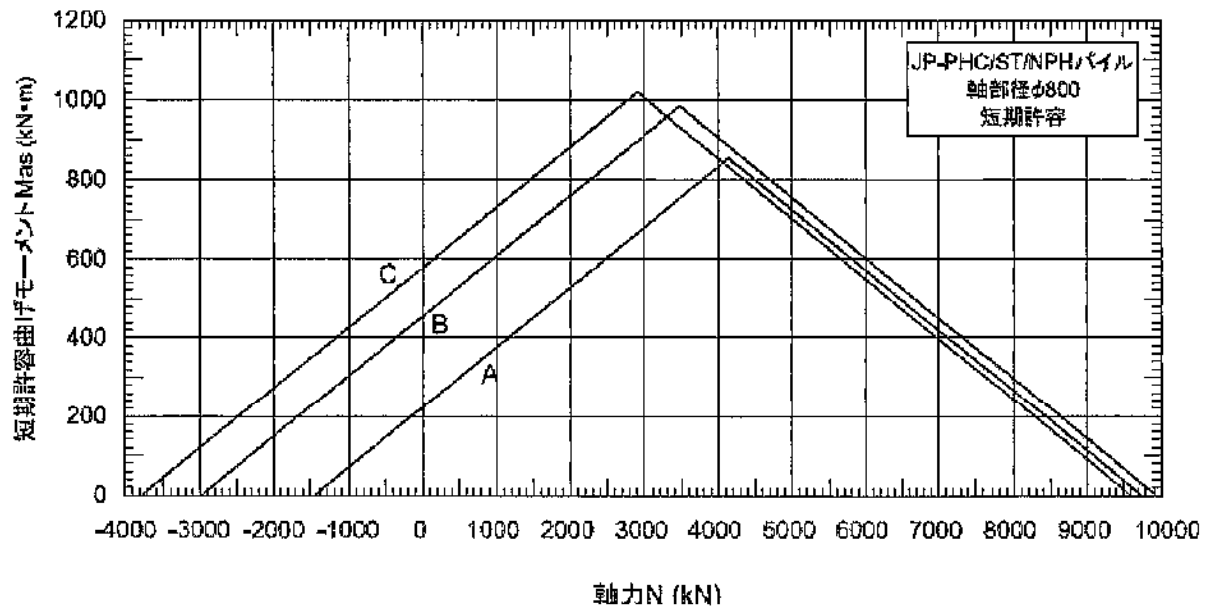
SCパイルの断面諸元

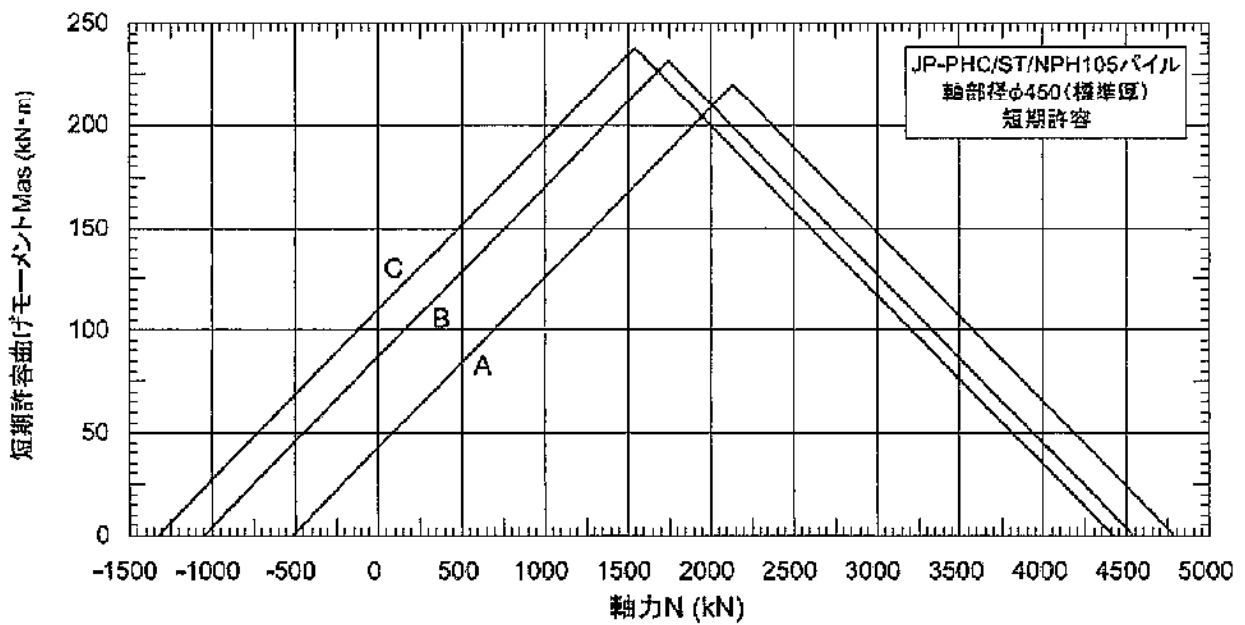
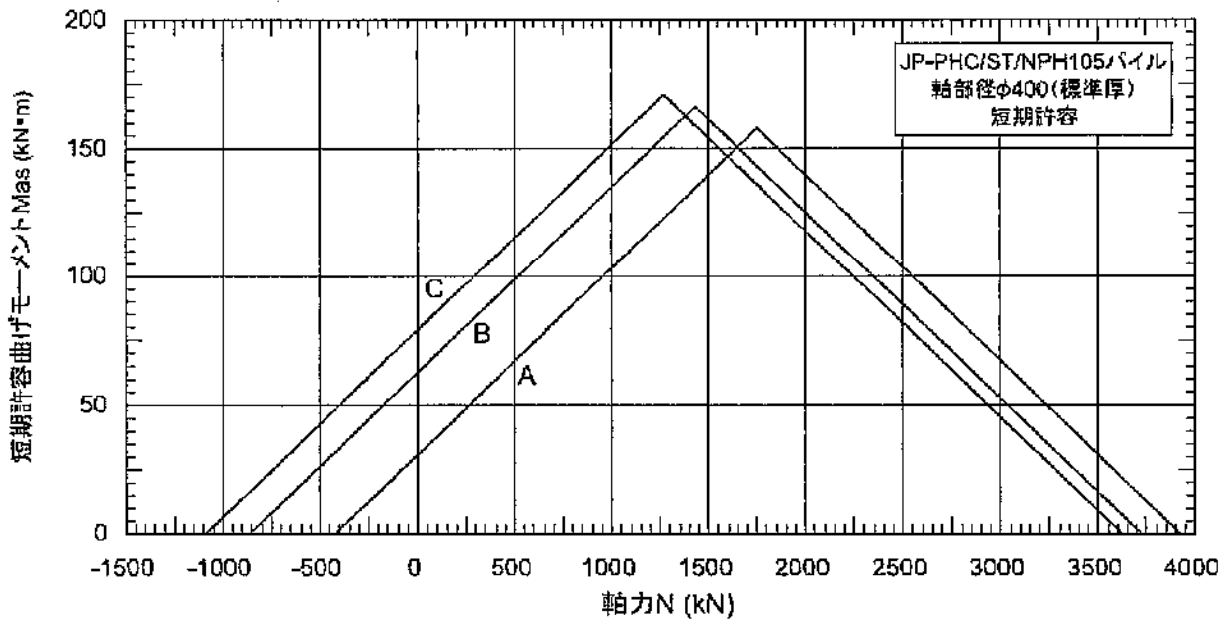
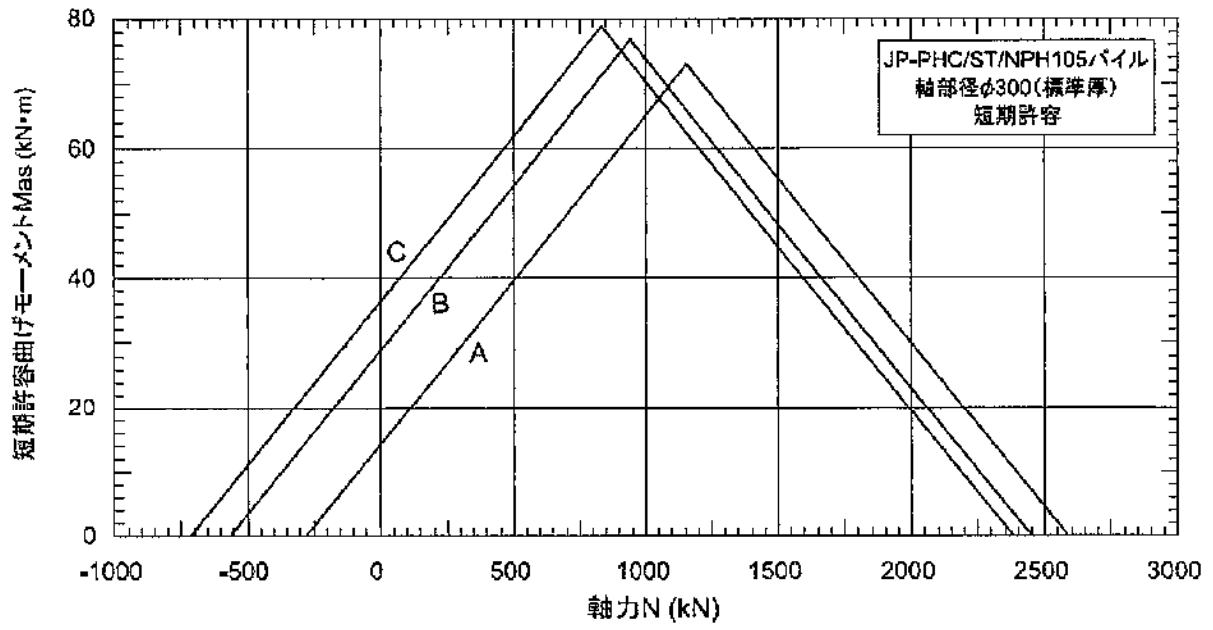
| 外径 D (mm) | 厚さ t (mm) | 鋼管板厚 ts (mm) | 鋼管 断面積 As × 10 ² (mm ²) | コンクリート Ac × 10 ² (mm ²) | 換算 断面積 Ae × 10 ² (mm ²) | 換算断 面 Ie × 10 ⁶ (mm ⁴) |
|-----------------|-----------------|--------------------|--|---|--|---|
| 400 | 65 | 4.5 | 43.38 | 628 | 850 | 1,319 |
| | | 6.0 | 61.73 | 610 | 926 | 1,463 |
| | | 9.0 | 98.02 | 574 | 1,076 | 1,740 |
| | | 12.0 | 133.74 | 538 | 1,223 | 2,004 |
| 450 | 70 | 4.5 | 48.88 | 773 | 1,023 | 2,022 |
| | | 6.0 | 69.59 | 752 | 1,109 | 2,228 |
| | | 9.0 | 110.58 | 711 | 1,278 | 2,628 |
| | | 12.0 | 151.02 | 671 | 1,445 | 3,012 |
| 500 | 80 | 4.5 | 54.37 | 986 | 1,264 | 3,049 |
| | | 6.0 | 77.44 | 962 | 1,359 | 3,334 |
| | | 9.0 | 123.15 | 917 | 1,548 | 3,888 |
| | | 12.0 | 168.30 | 872 | 1,734 | 4,422 |
| | | 14.0 | 198.08 | 842 | 1,857 | 4,767 |
| 600 | 90 | 16.0 | 227.61 | 812 | 1,979 | 5,104 |
| | | 4.5 | 65.37 | 1,358 | 1,693 | 5,941 |
| | | 6.0 | 93.15 | 1,330 | 1,807 | 6,439 |
| | | 9.0 | 148.28 | 1,275 | 2,035 | 7,412 |
| | | 12.0 | 202.85 | 1,220 | 2,260 | 8,355 |
| | | 14.0 | 238.92 | 1,184 | 2,409 | 8,968 |
| 700 | 100 | 16.0 | 274.73 | 1,148 | 2,556 | 9,568 |
| | | 19.0 | 327.98 | 1,095 | 2,776 | 10,444 |
| | | 6.0 | 108.86 | 1,754 | 2,312 | 11,280 |
| | | 9.0 | 173.42 | 1,690 | 2,578 | 12,840 |
| | | 12.0 | 237.41 | 1,626 | 2,842 | 14,360 |
| | | 14.0 | 279.76 | 1,583 | 3,017 | 15,350 |
| | | 16.0 | 321.86 | 1,541 | 3,191 | 16,330 |
| 800 | 110 | 19.0 | 384.53 | 1,478 | 3,449 | 17,760 |
| | | 22.0 | 446.64 | 1,416 | 3,705 | 19,150 |
| | | 6.0 | 124.56 | 2,235 | 2,873 | 18,390 |
| | | 9.0 | 198.55 | 2,161 | 3,178 | 20,740 |
| | | 12.0 | 271.97 | 2,087 | 3,481 | 23,040 |
| | | 14.0 | 320.60 | 2,039 | 3,682 | 24,540 |
| | | 16.0 | 368.98 | 1,990 | 3,881 | 26,020 |
| | | 19.0 | 441.08 | 1,918 | 4,179 | 28,200 |
| 900 | 120 | 22.0 | 512.61 | 1,847 | 4,474 | 30,320 |
| | | 25.0 | 583.58 | 1,776 | 4,767 | 32,400 |
| | | 6.0 | 140.27 | 2,772 | 3,491 | 28,370 |
| | | 9.0 | 223.68 | 2,689 | 3,835 | 31,740 |
| | | 12.0 | 306.53 | 2,606 | 4,177 | 35,040 |
| | | 14.0 | 361.44 | 2,551 | 4,403 | 37,210 |
| | | 16.0 | 416.10 | 2,496 | 4,629 | 39,340 |
| | | 19.0 | 497.63 | 2,415 | 4,965 | 42,490 |
| 1,000 | 130 | 22.0 | 578.59 | 2,334 | 5,299 | 45,570 |
| | | 25.0 | 658.98 | 2,253 | 5,631 | 48,580 |
| | | 6.0 | 155.98 | 3,366 | 4,165 | 41,910 |
| | | 9.0 | 248.81 | 3,273 | 4,548 | 46,550 |
| | | 12.0 | 341.08 | 3,181 | 4,929 | 51,110 |
| | | 14.0 | 402.28 | 3,119 | 5,181 | 54,100 |
| | | 16.0 | 463.23 | 3,059 | 5,433 | 57,060 |
| | | 19.0 | 554.18 | 2,968 | 5,808 | 61,430 |
| 1,000 | 130 | 22.0 | 644.56 | 2,877 | 6,181 | 65,710 |
| | | 25.0 | 734.38 | 2,787 | 6,551 | 69,920 |

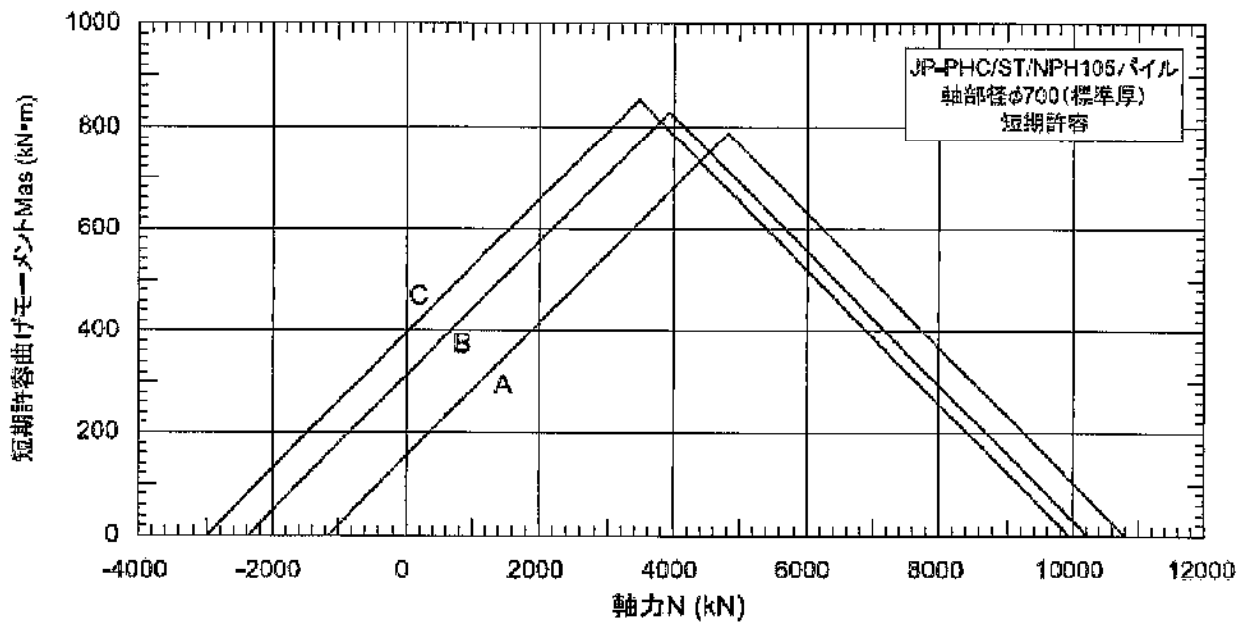
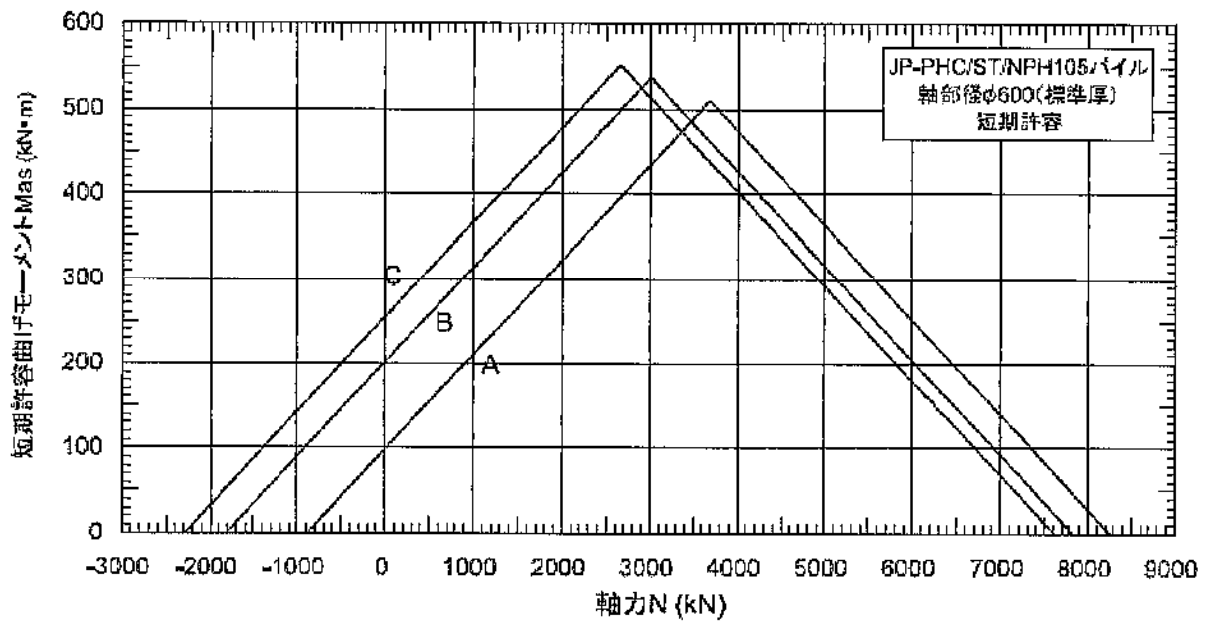
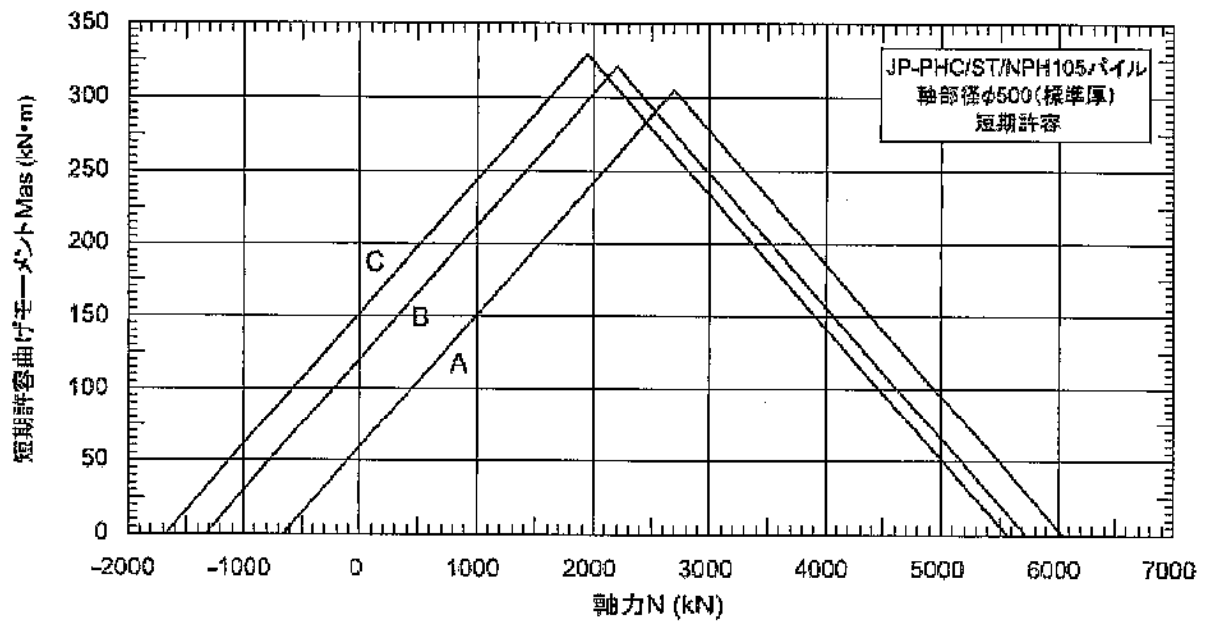
※ 外径・厚さ・鋼管板厚以外の数値は腐食しる1mmを考慮した値を示す。

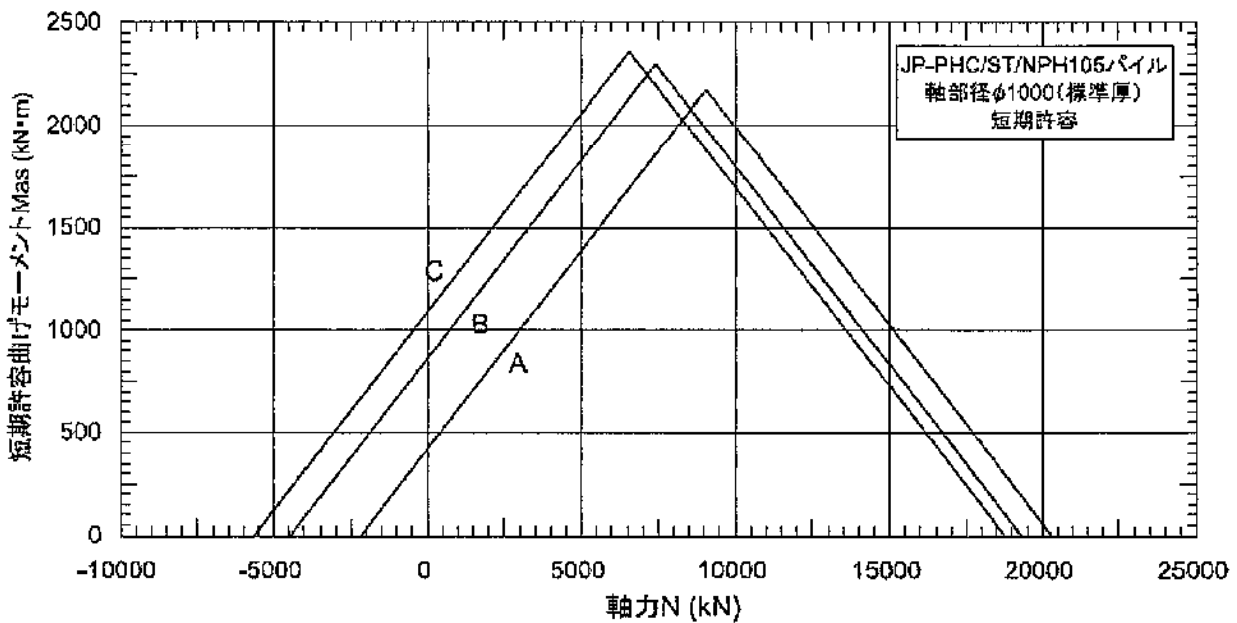
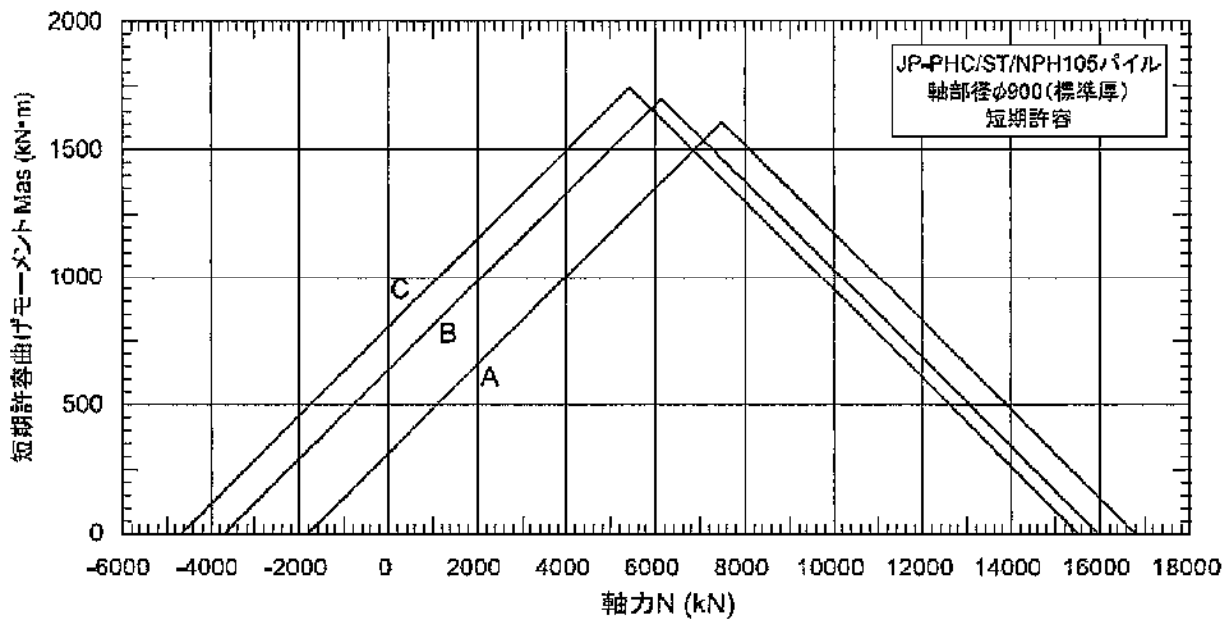
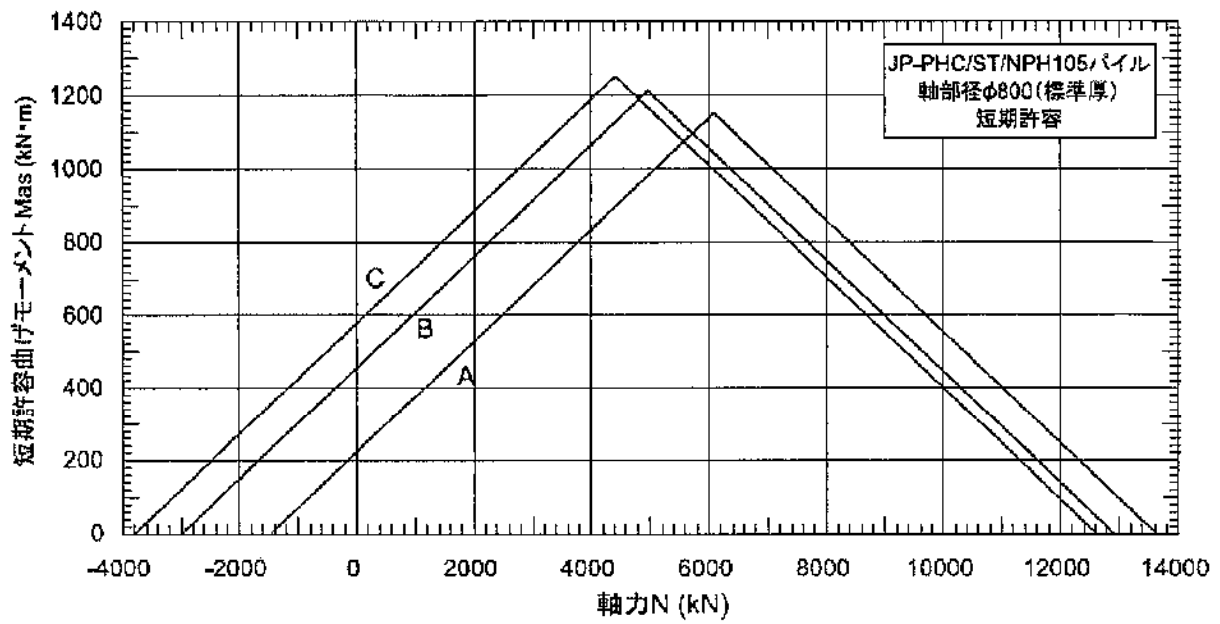


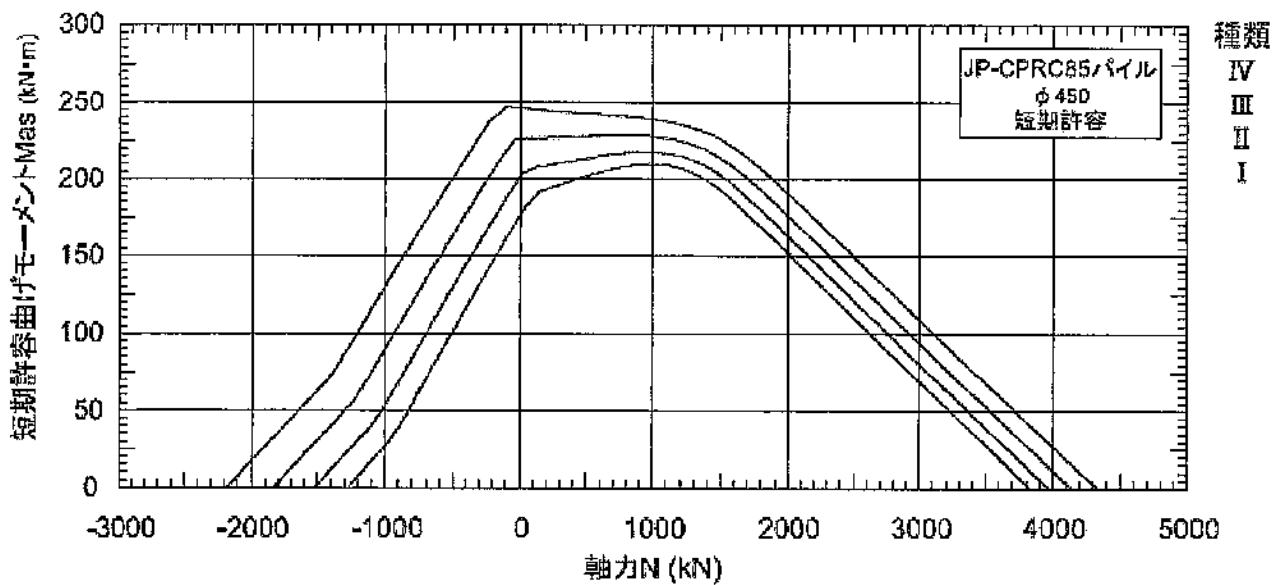
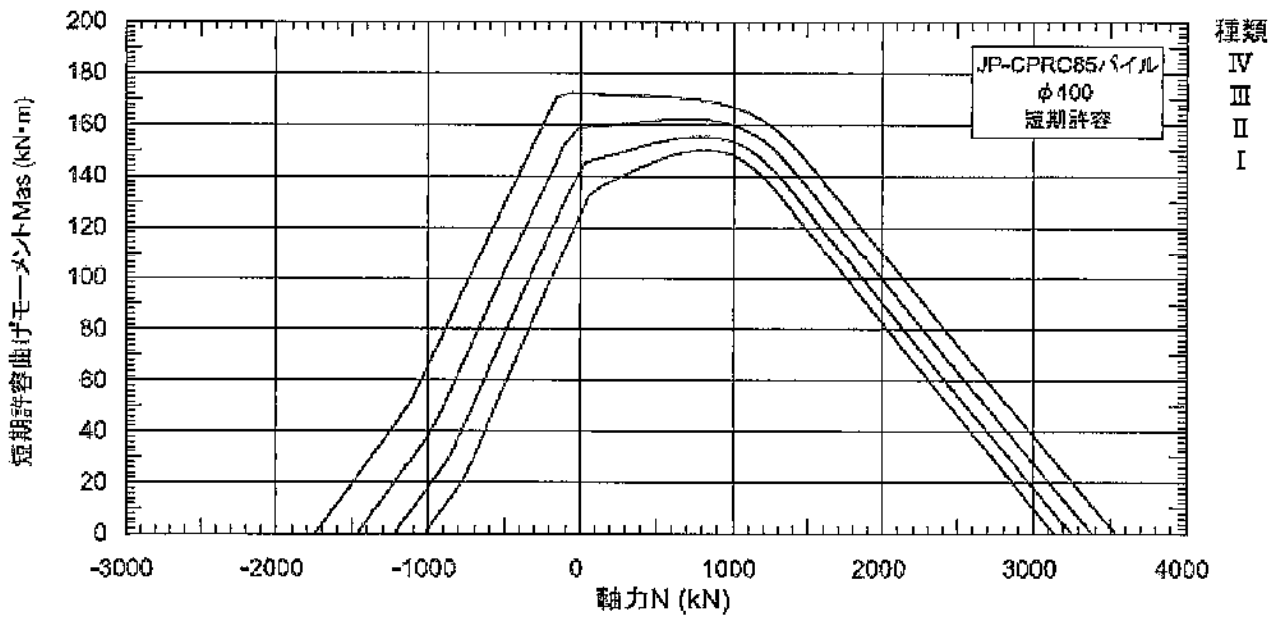
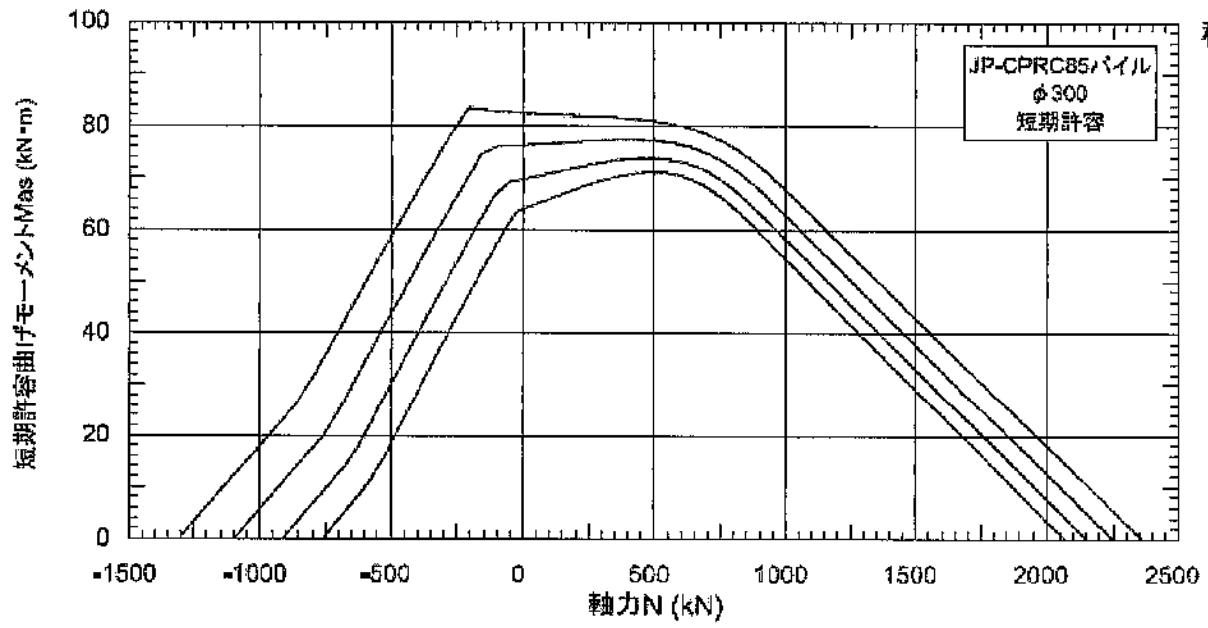


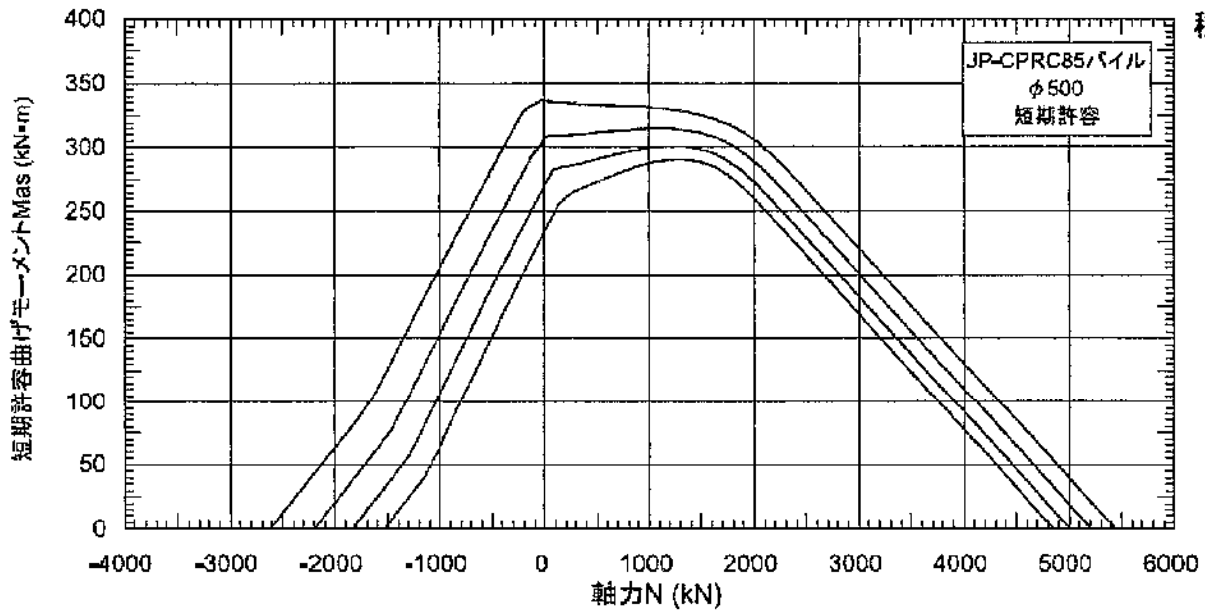




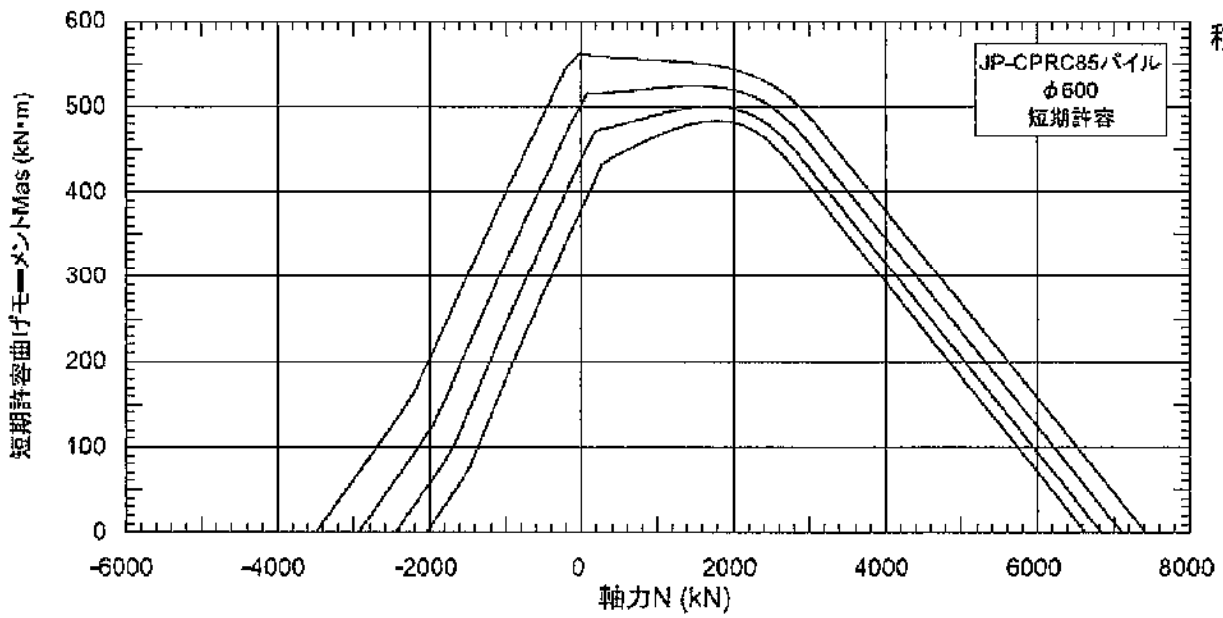




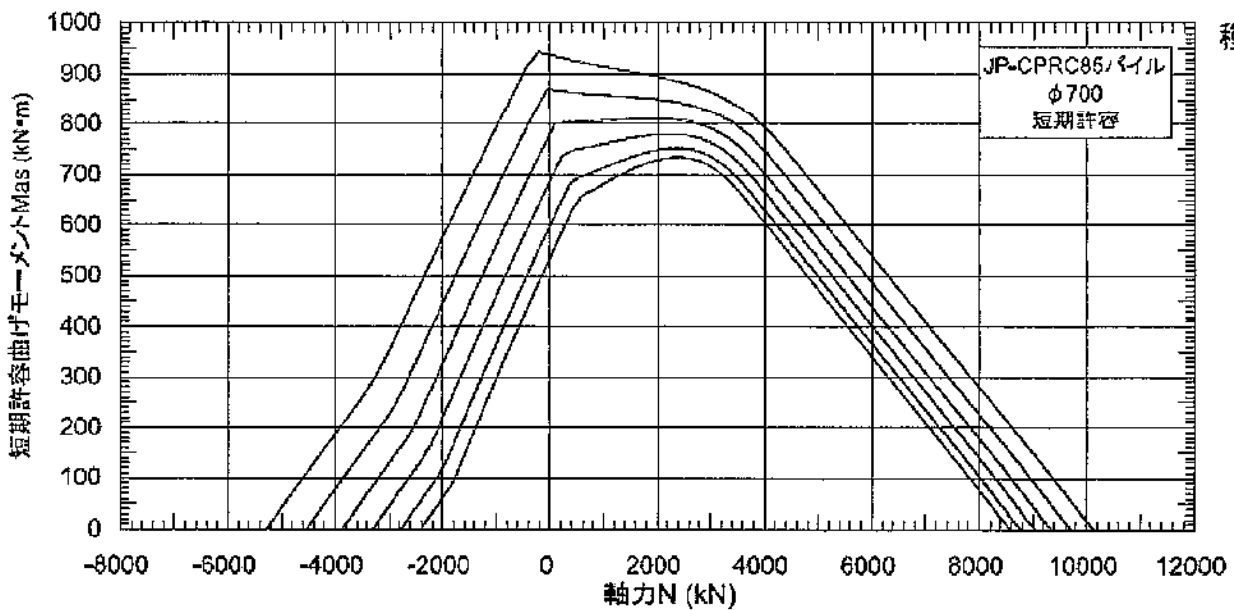




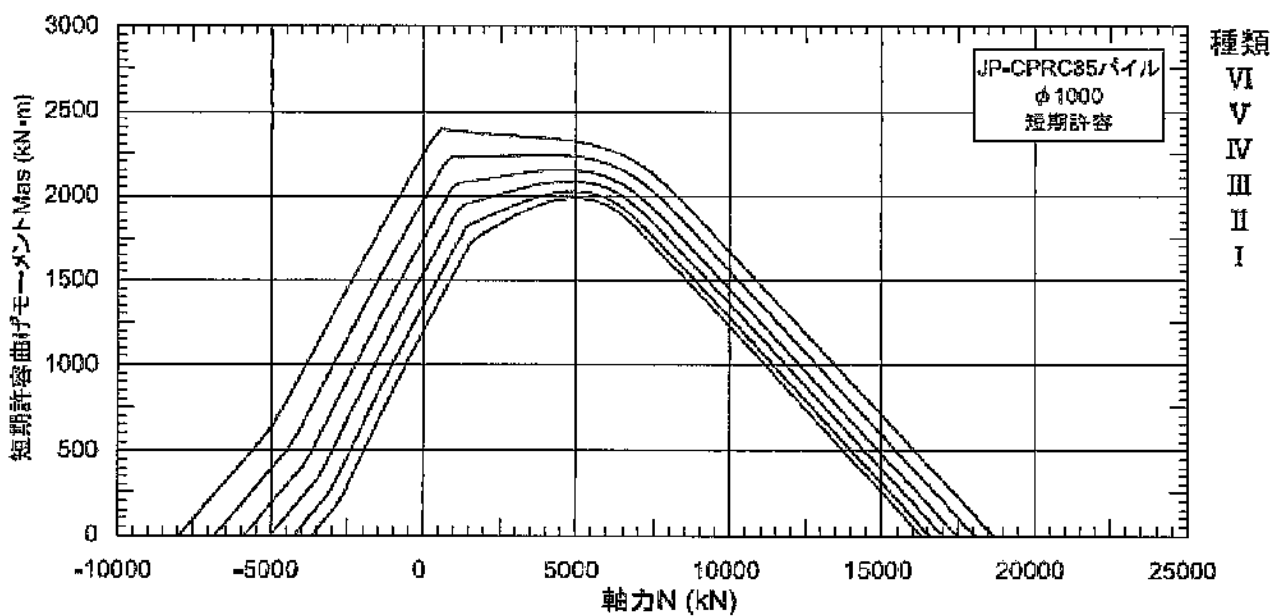
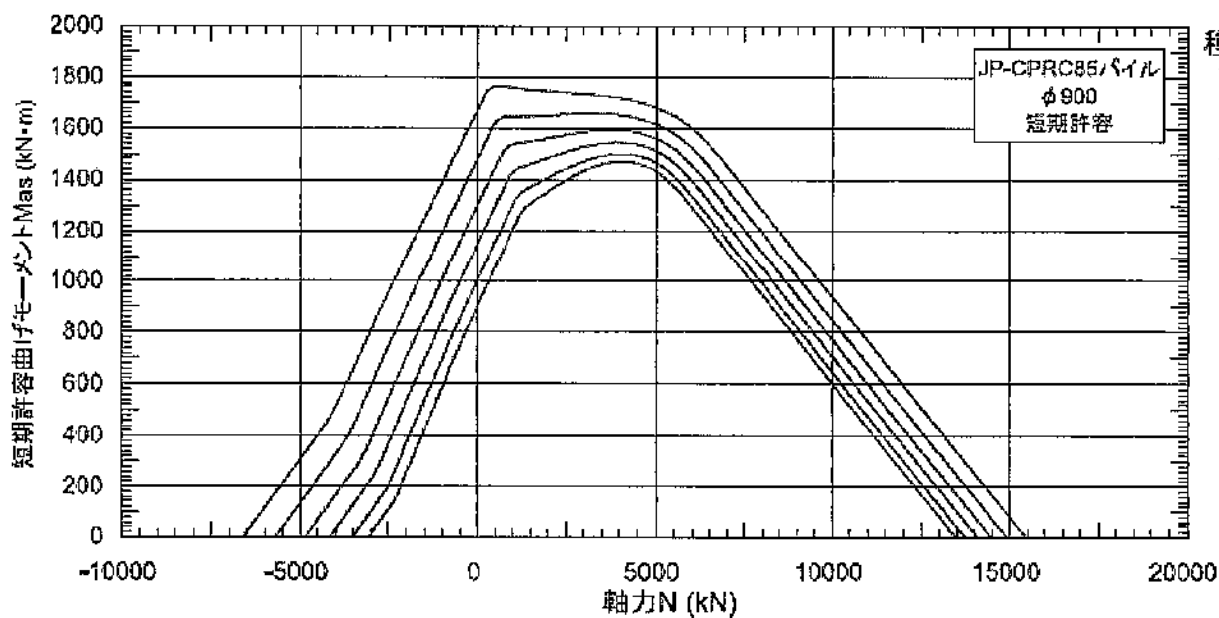
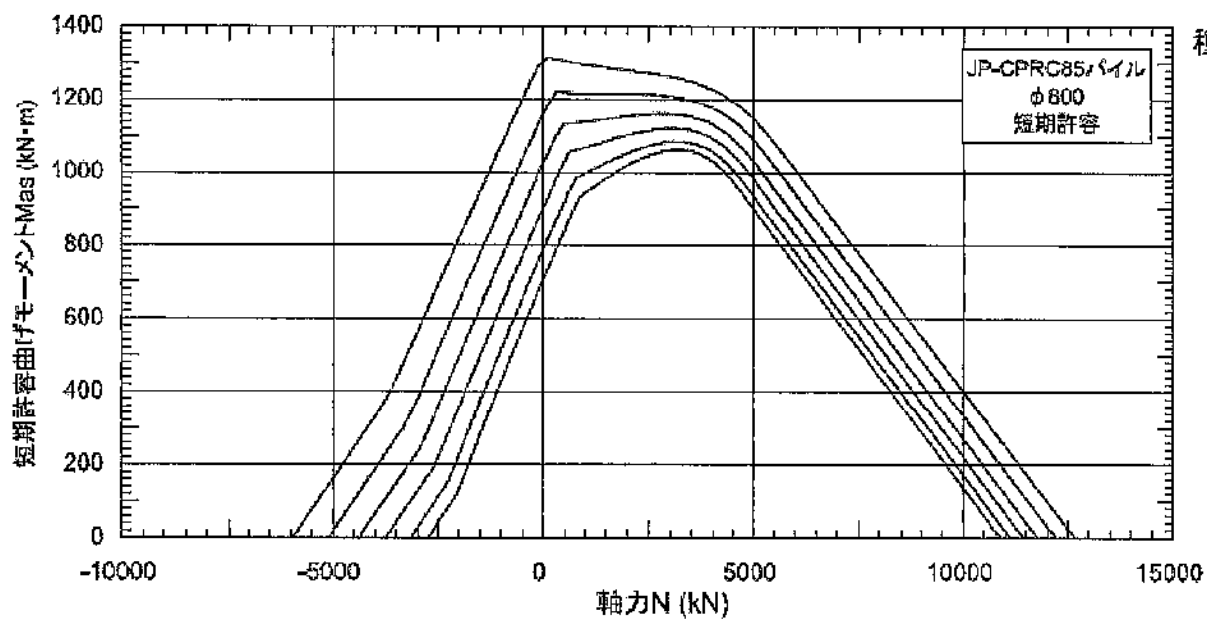
種類
IV
III
II
I

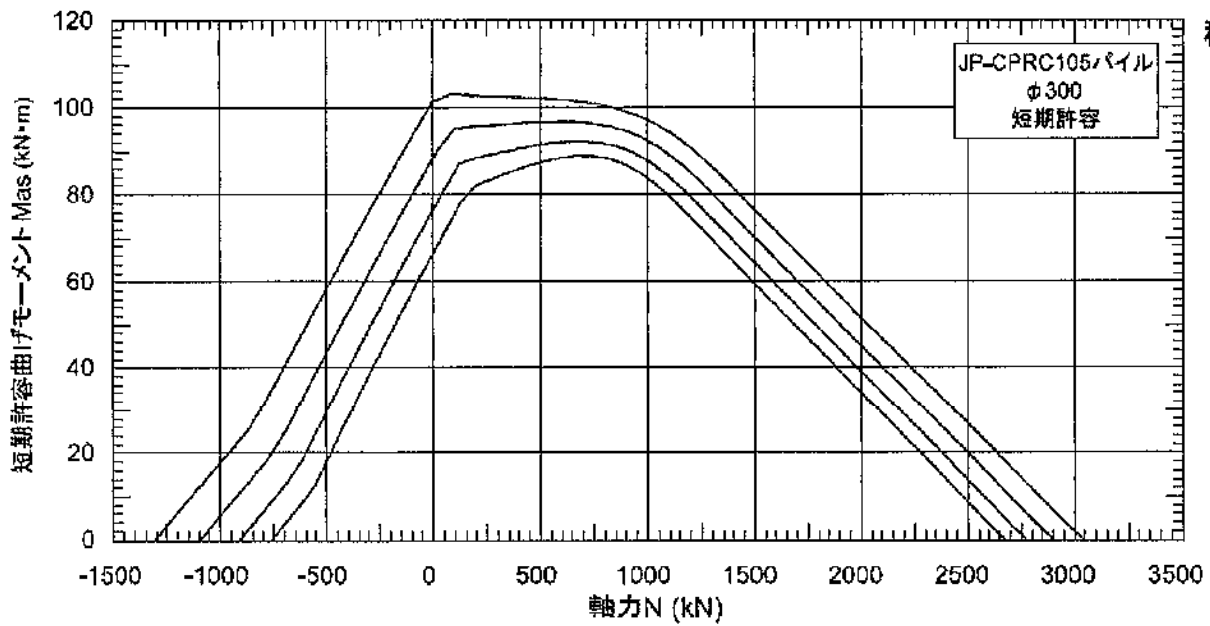


種類
IV
III
II
I

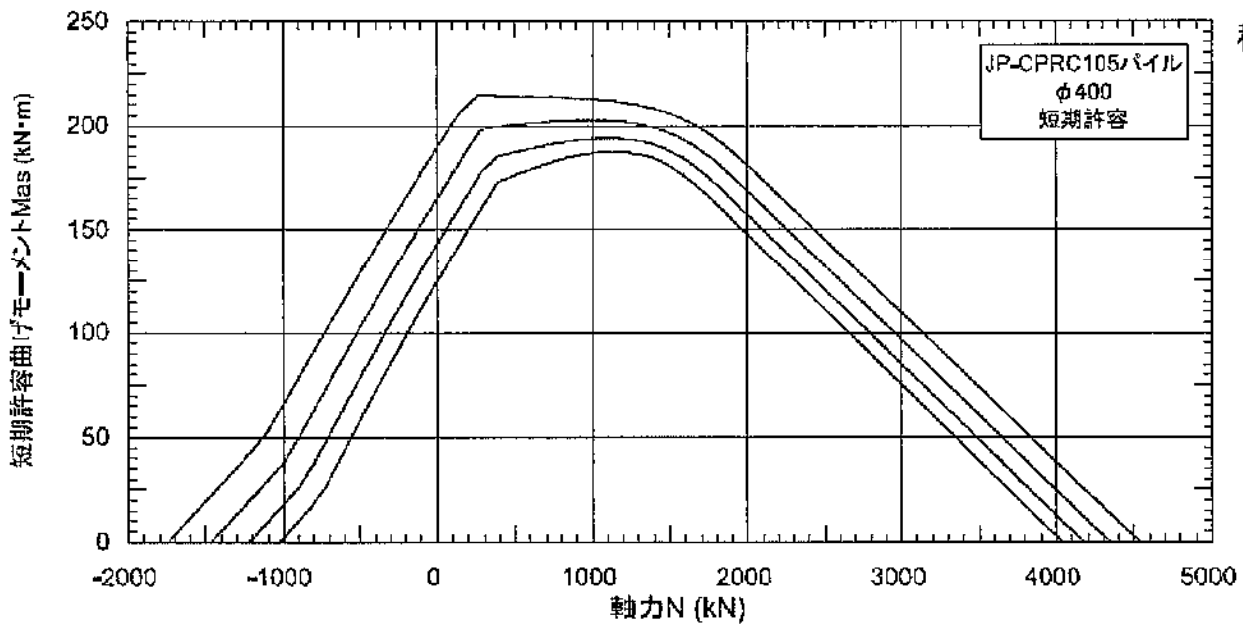


種類
VI
V
IV
III
II
I

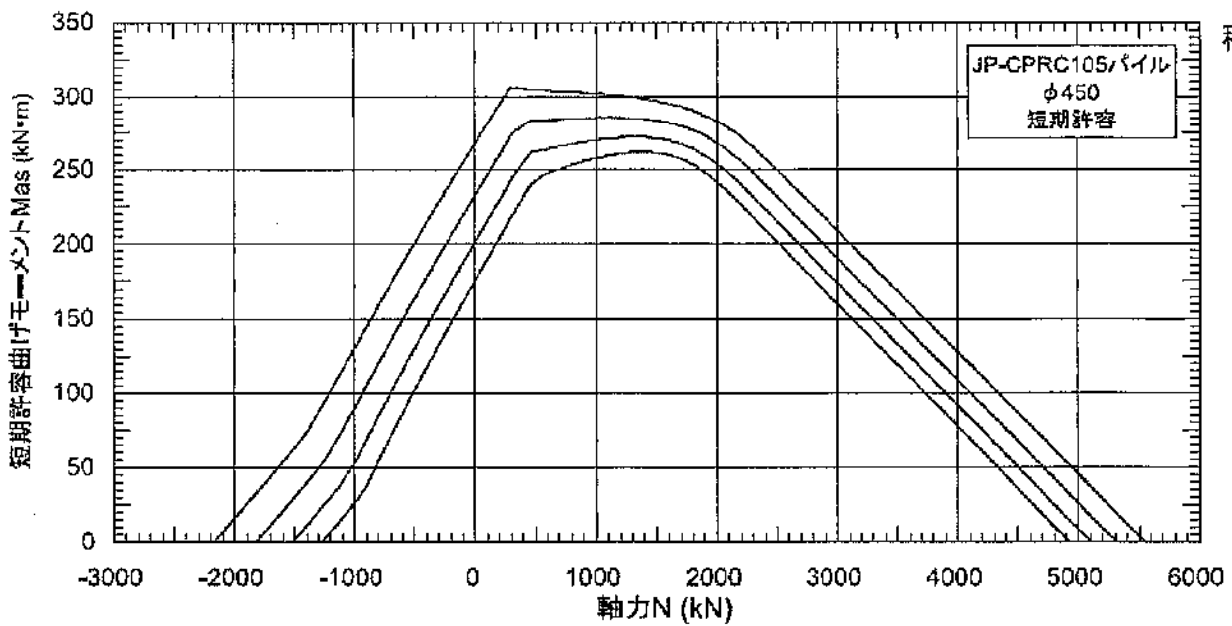




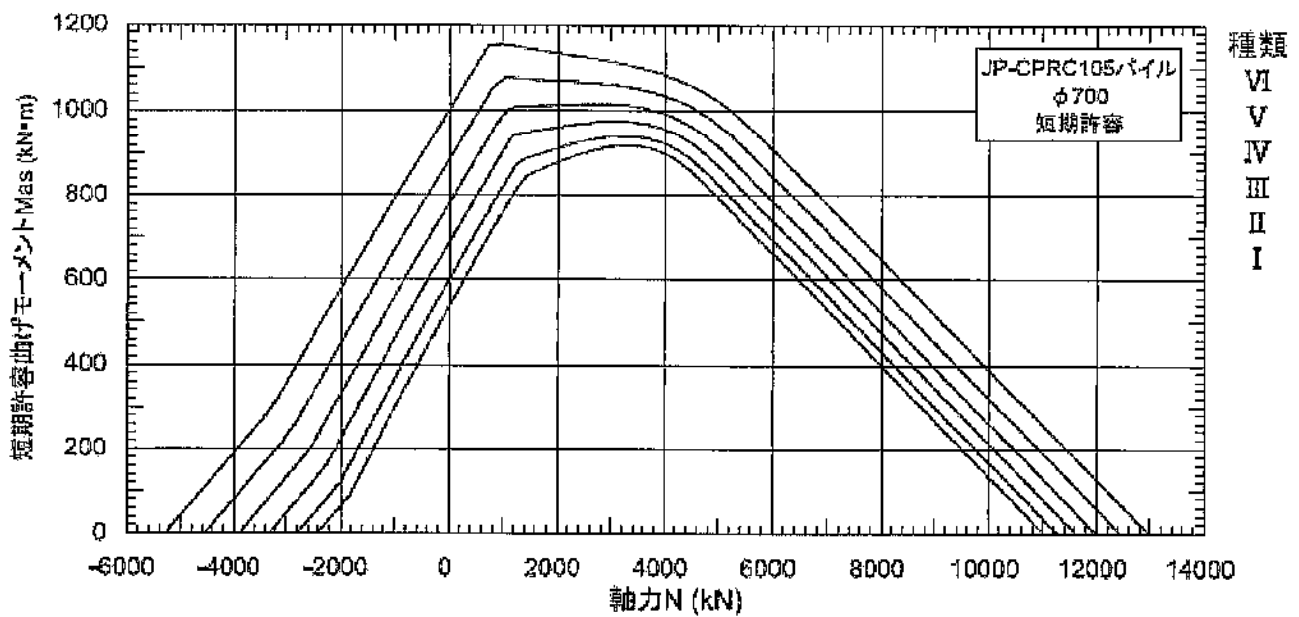
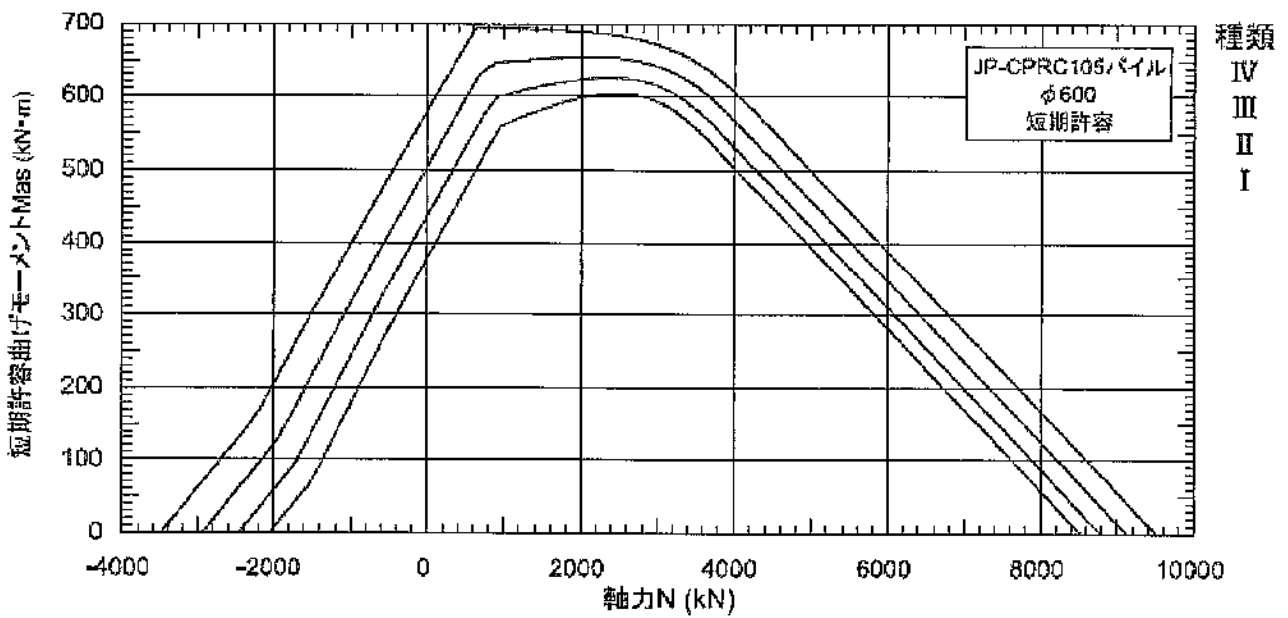
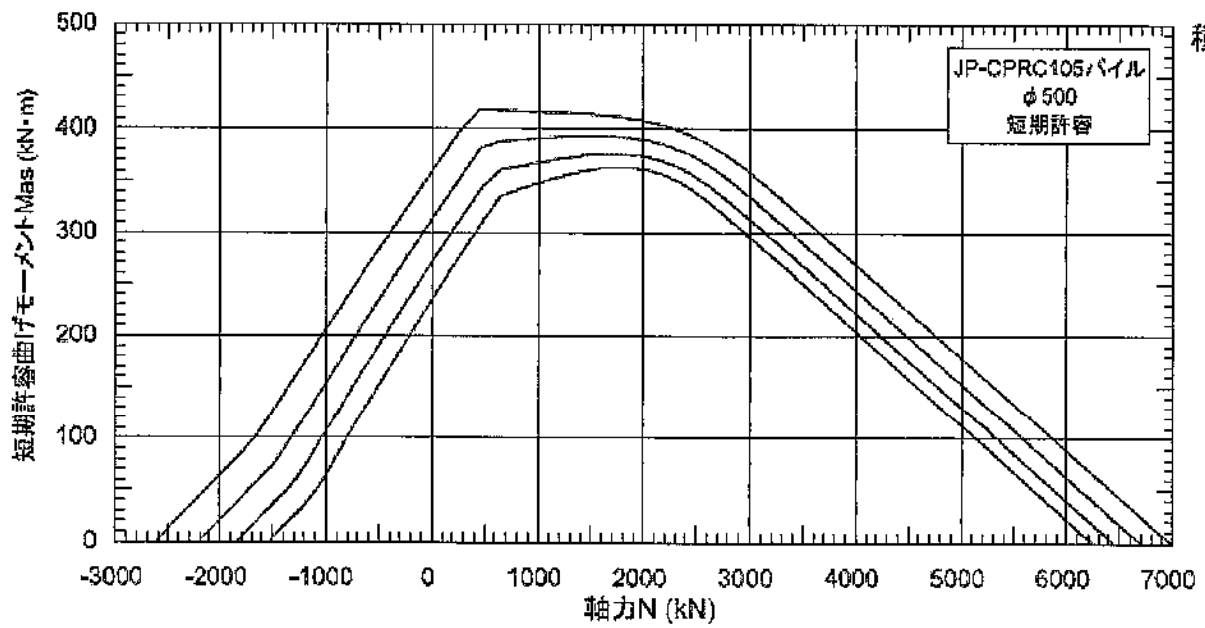
種類
IV
III
II
I

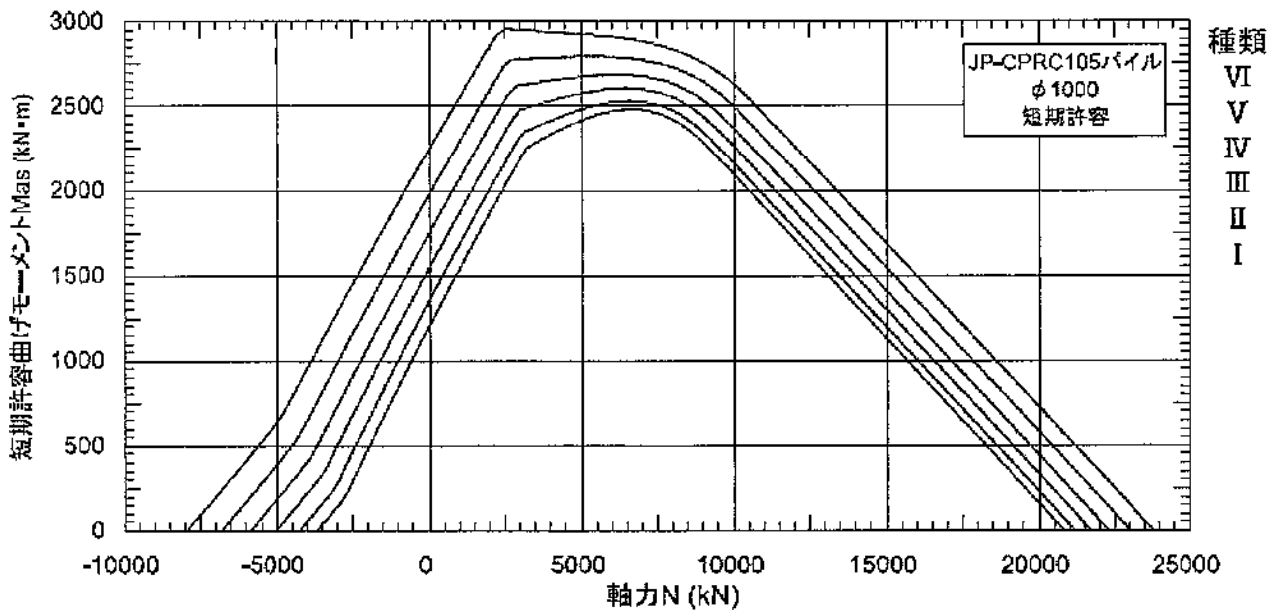
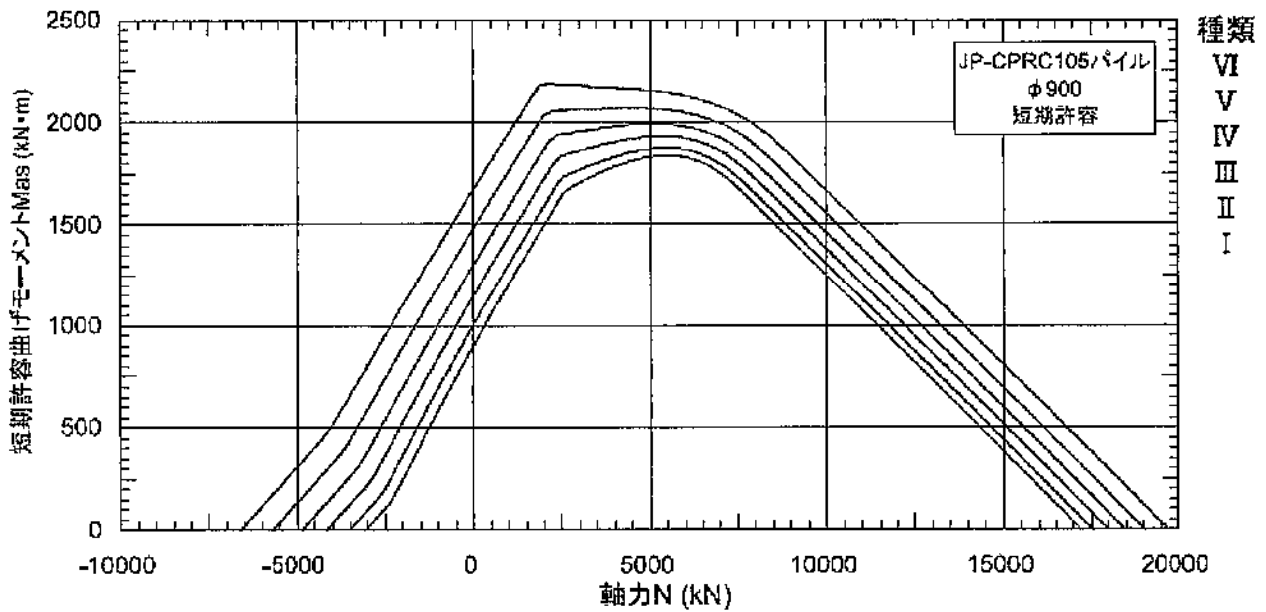
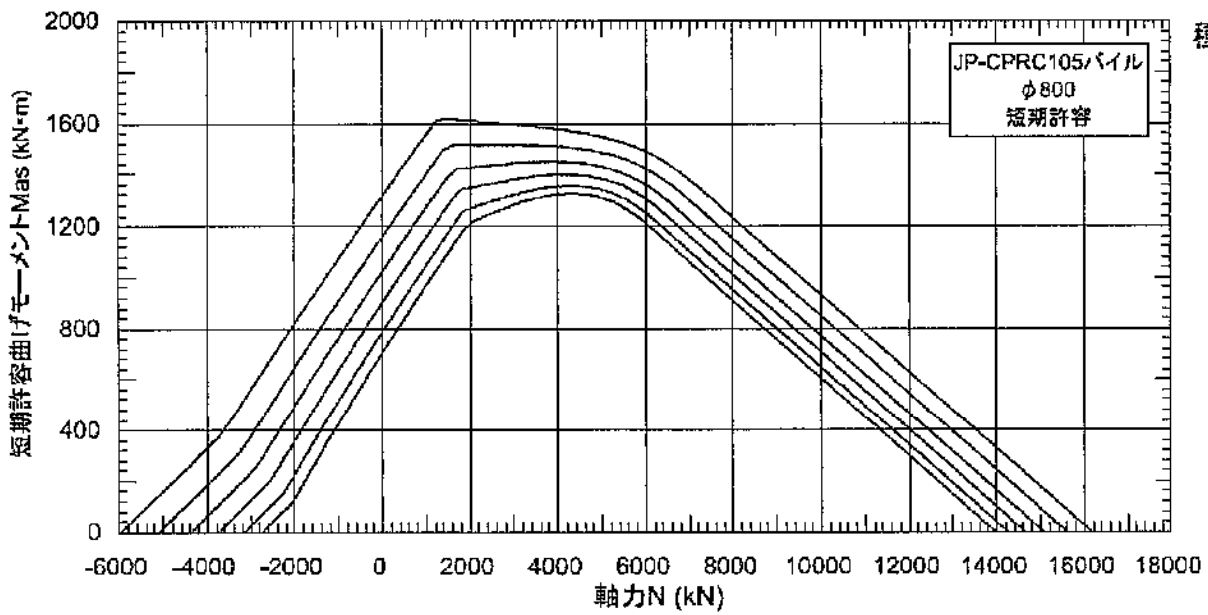


種類
IV
III
II
I

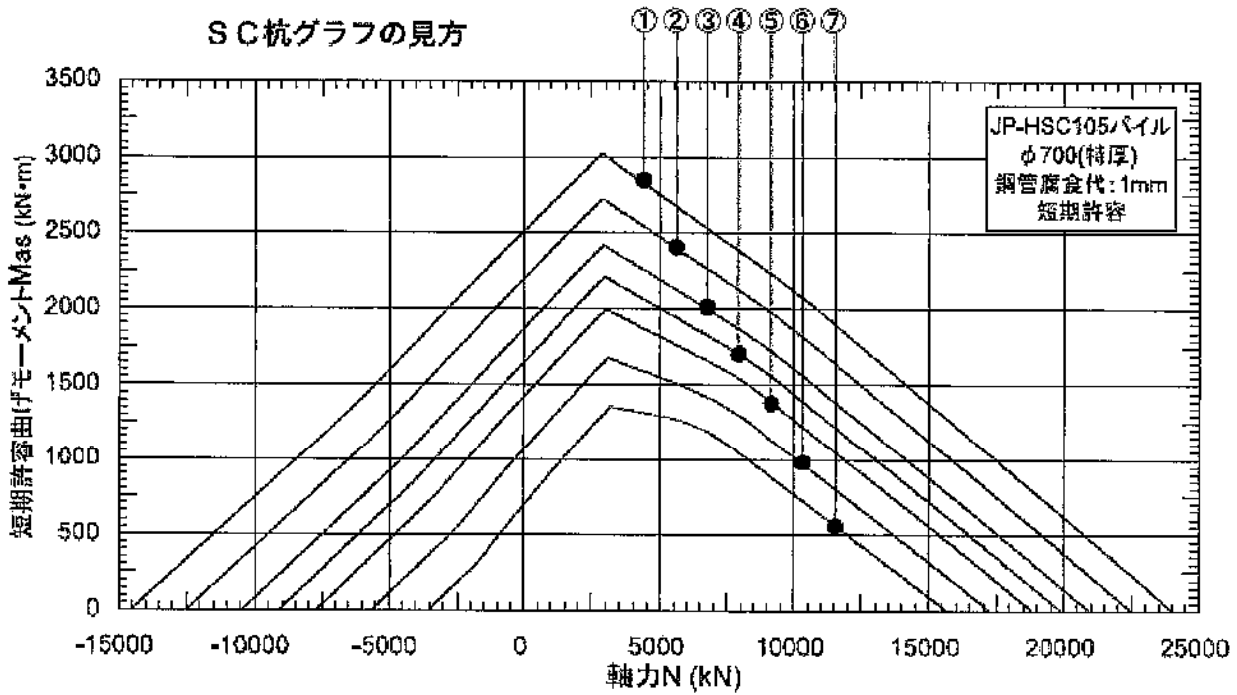


種類
IV
III
II
I



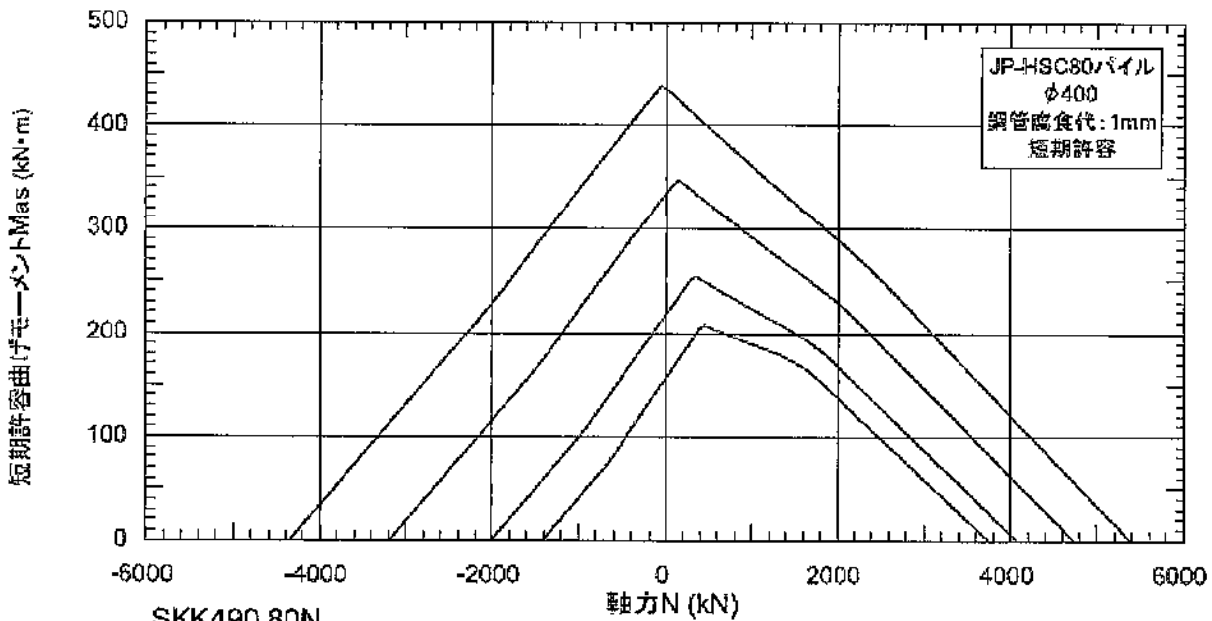


SC杭グラフの見方



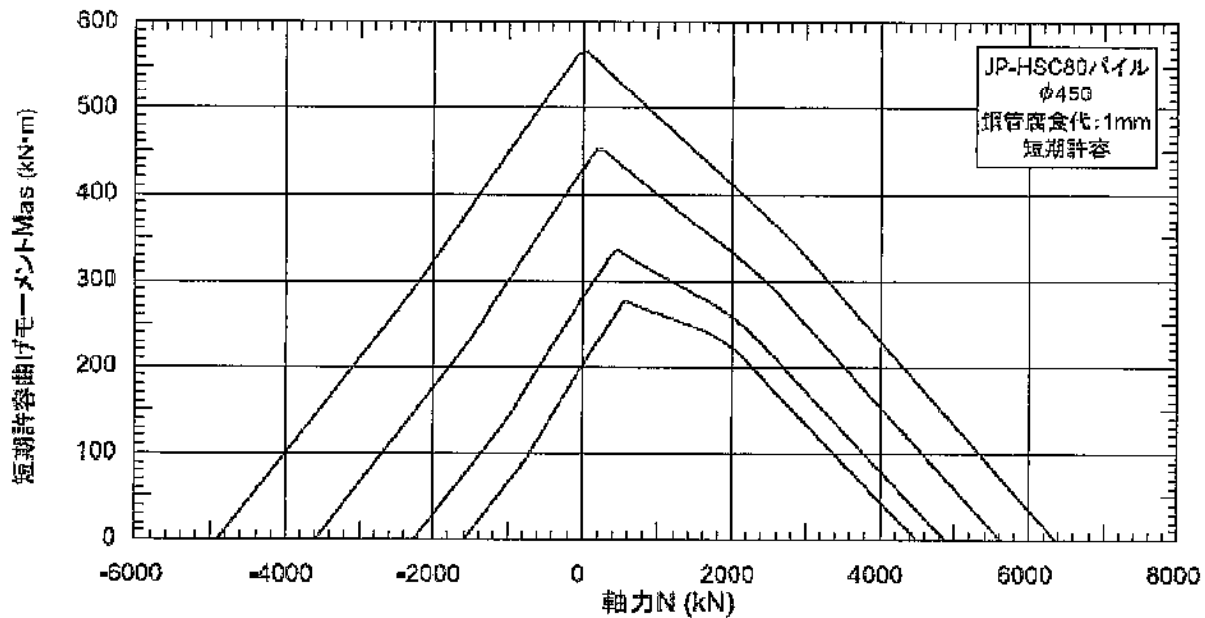
- 鋼管厚 (mm)
- ts=22 ①
 - ts=19 ②
 - ts=16 ③
 - ts=14 ④
 - ts=12 ⑤
 - ts=9 ⑥
 - ts=6 ⑦

SKK490 80N



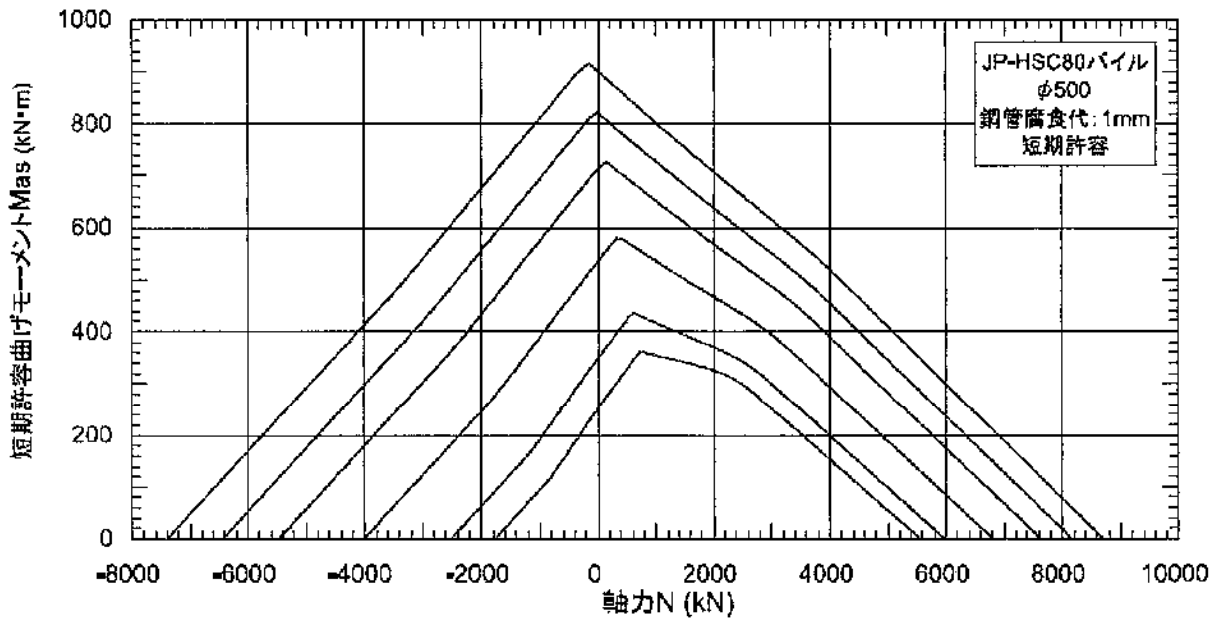
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SKK490 80N



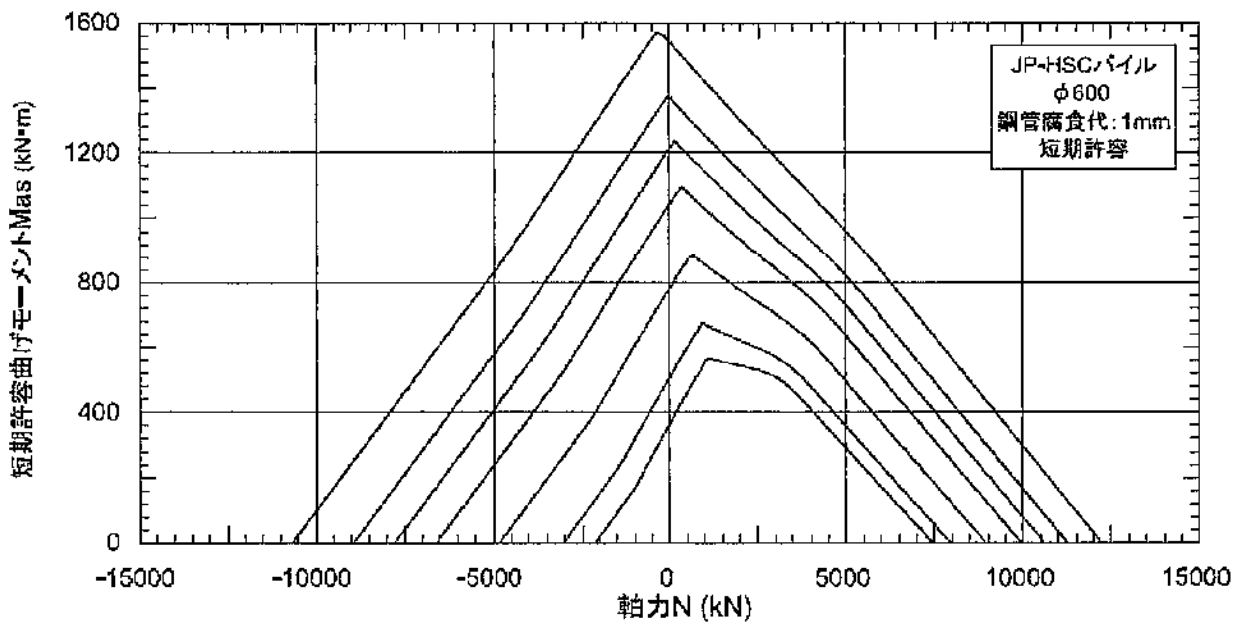
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SKK490 80N



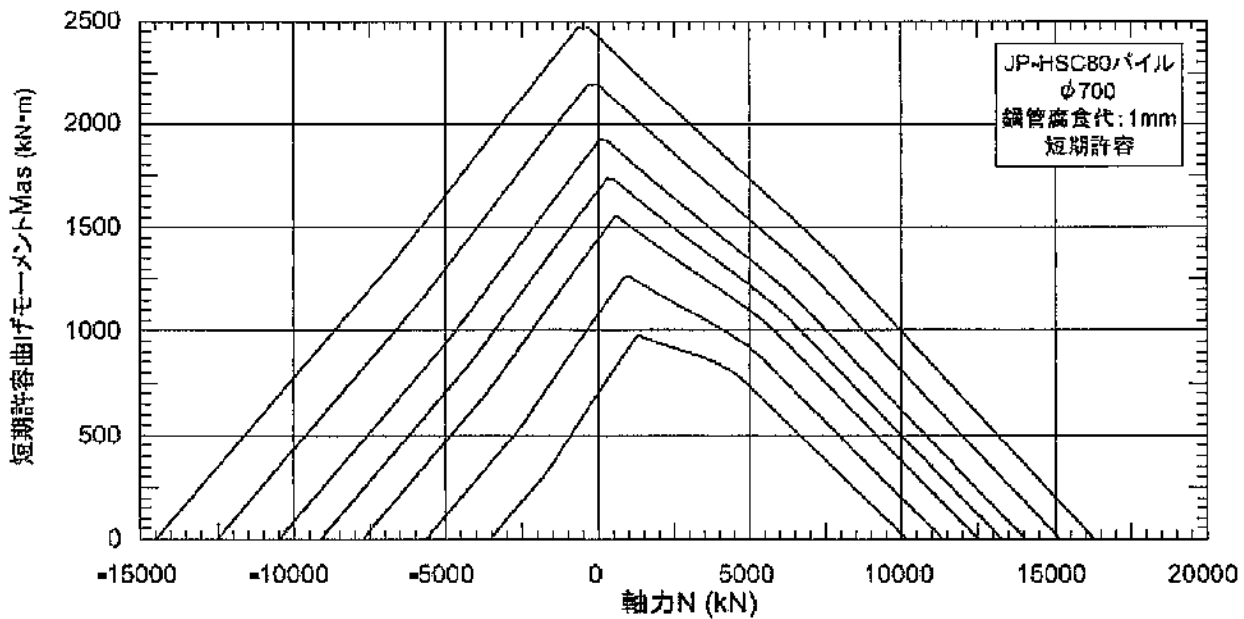
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(mm)
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SKK490 80N



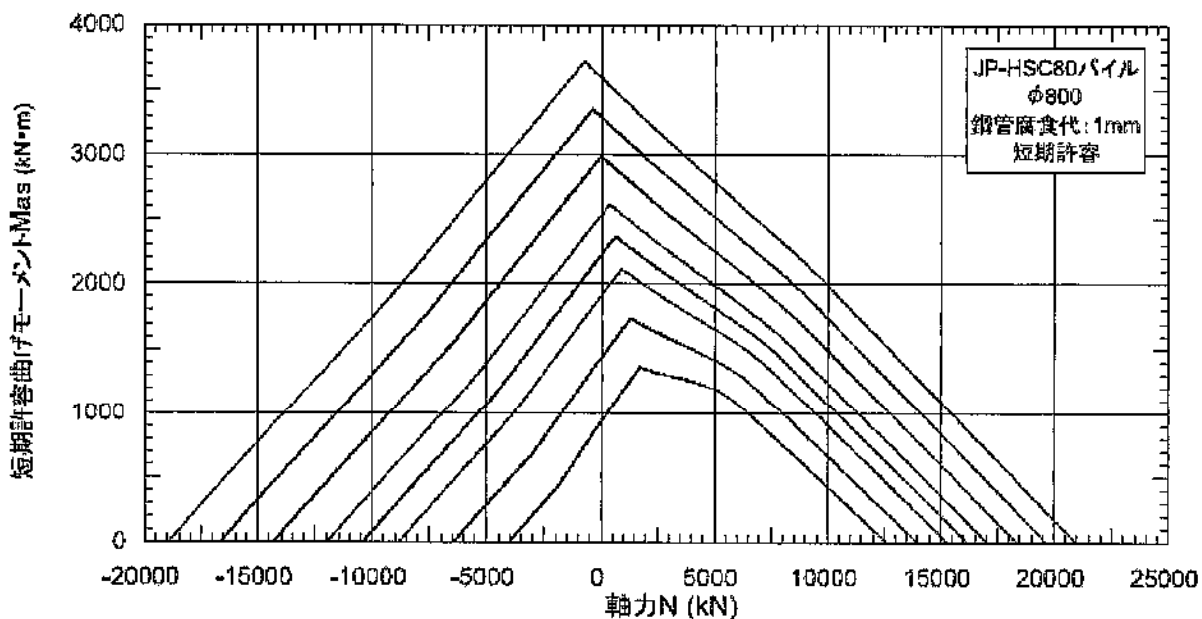
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SKK490 80N



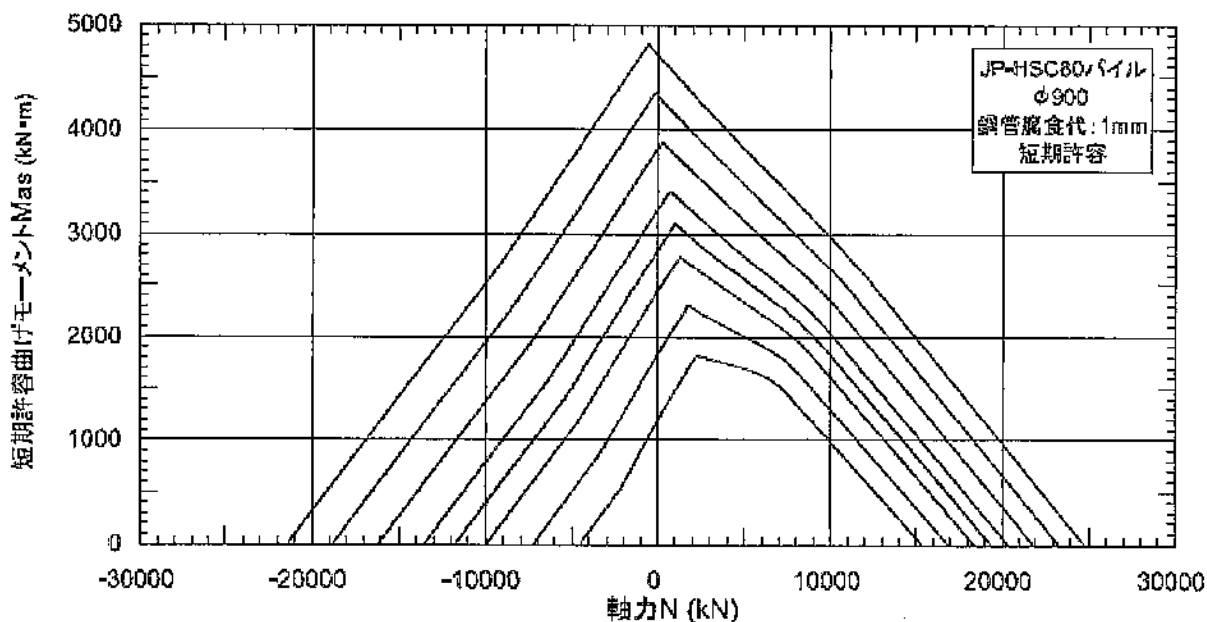
鋼管厚
(mm)
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ts=19
ts=16
ts=14
ts=12
ts=9
ts=6

SKK490 80N



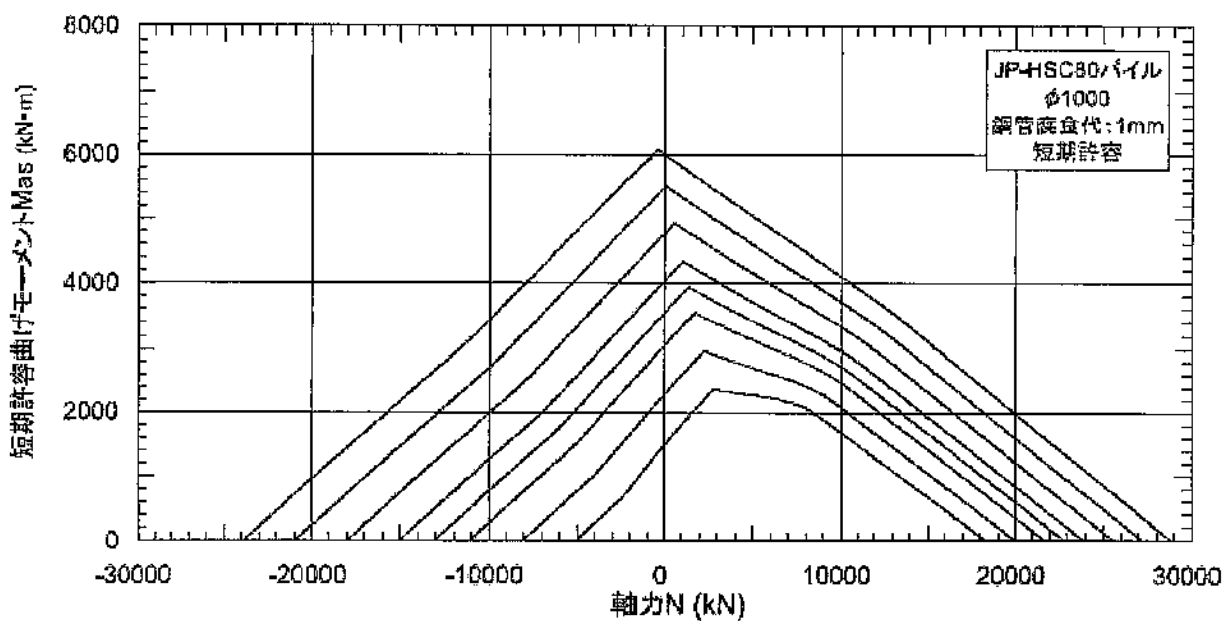
鋼管厚
(mm)
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ts=22
ts=19
ts=16
ts=14
ts=12
ts=9
ts=6

SKK490 80N

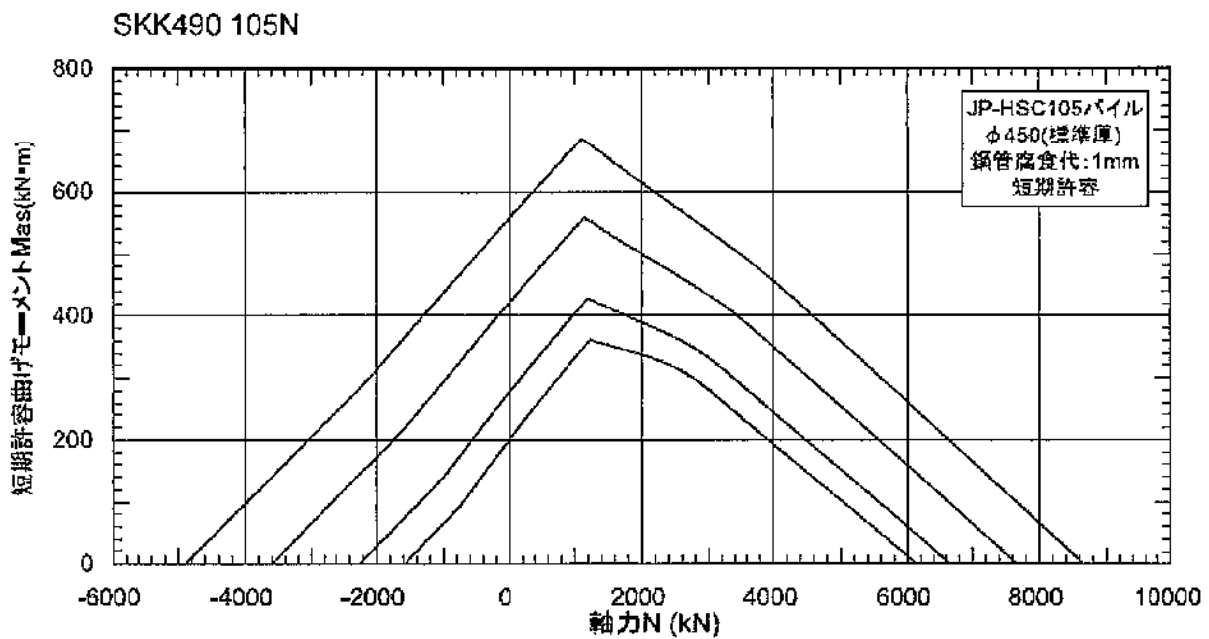
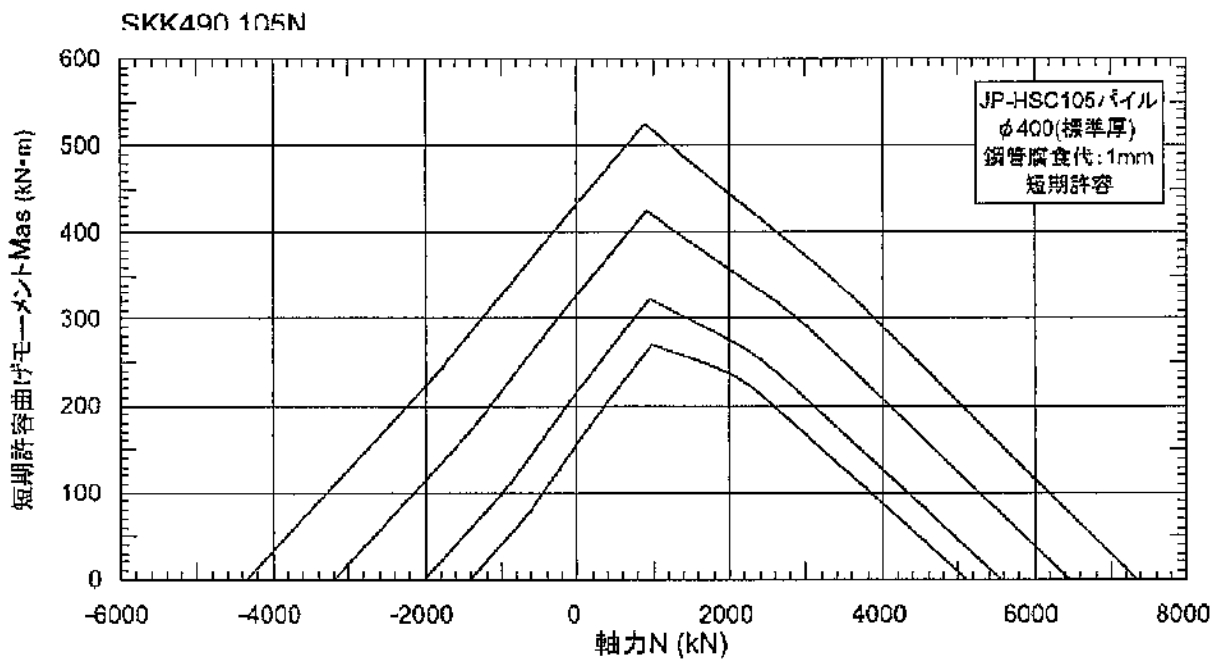
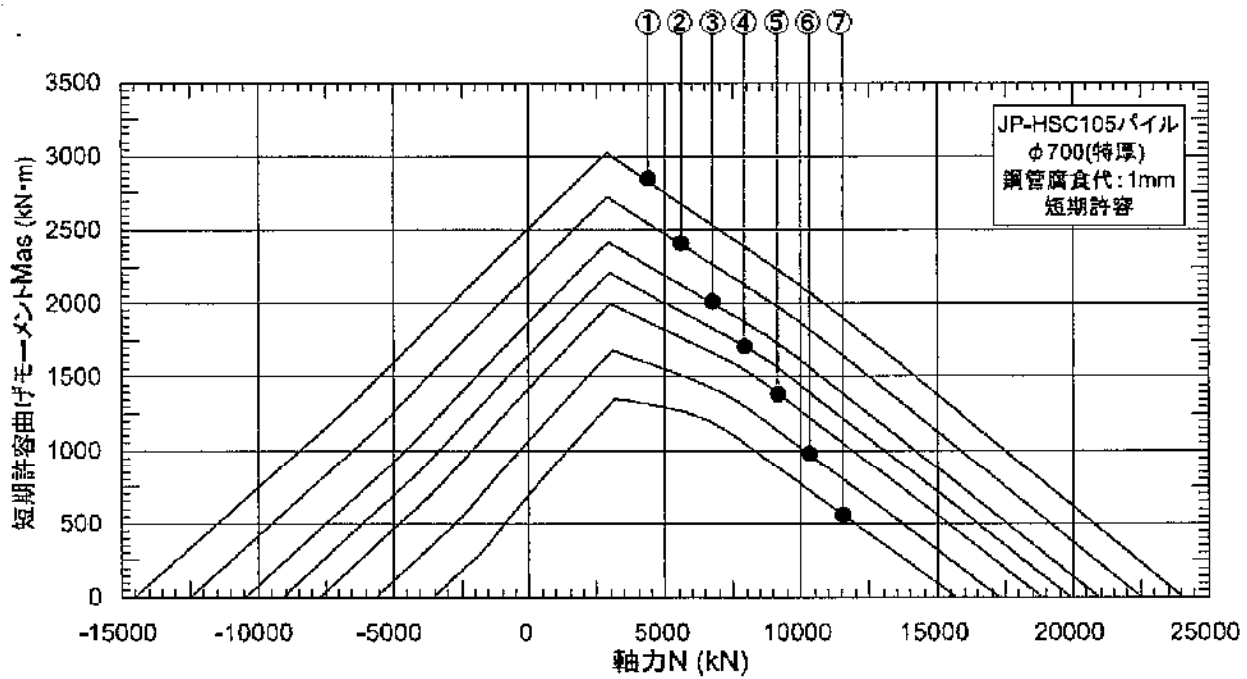


鋼管厚
(mm)
ts=25
ts=22
ts=19
ts=16
ts=14
ts=12
ts=9
ts=6

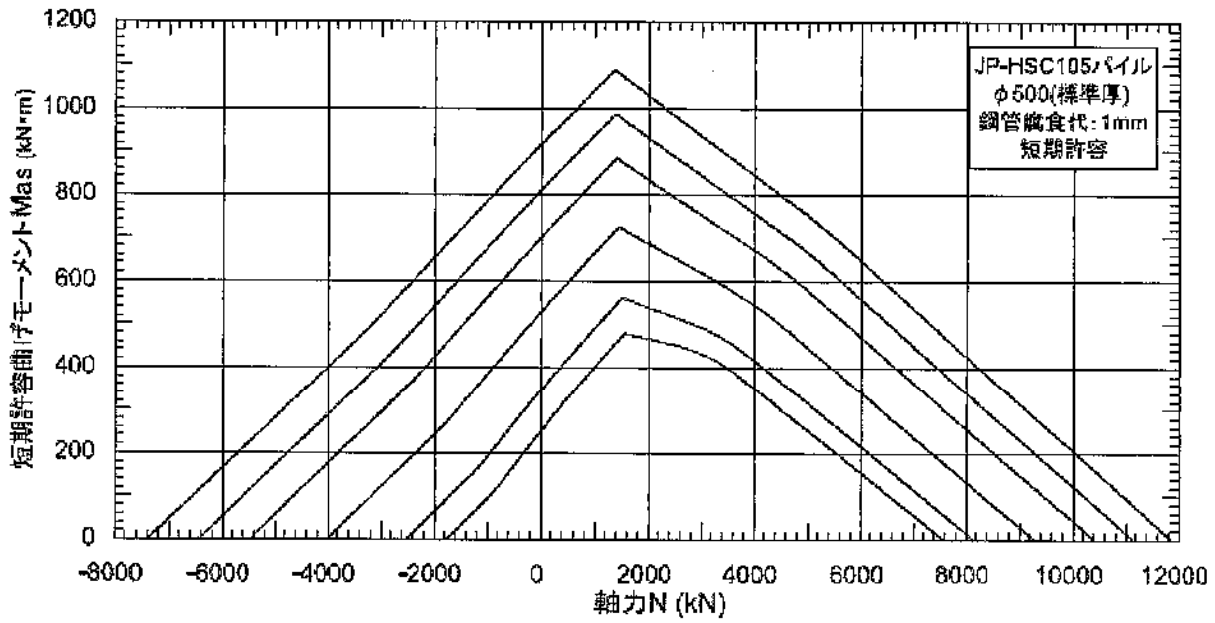
SKK490 80N



鋼管厚
(mm)
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ts=22
ts=19
ts=16
ts=14
ts=12
ts=9
ts=6

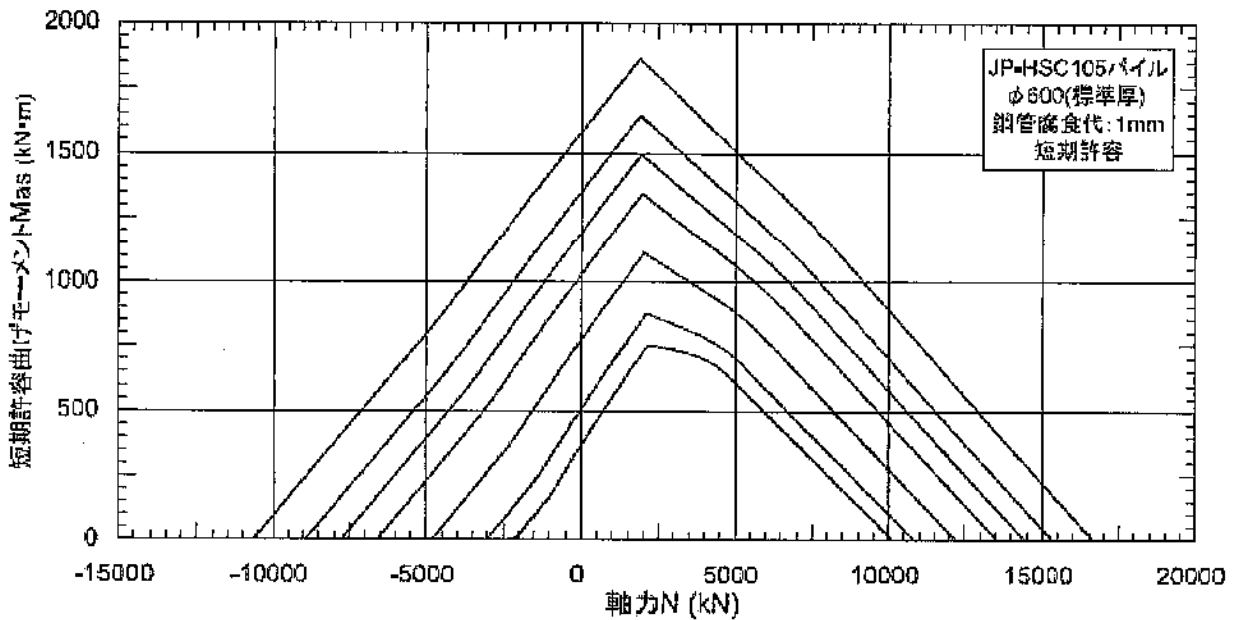


SKK490 105N



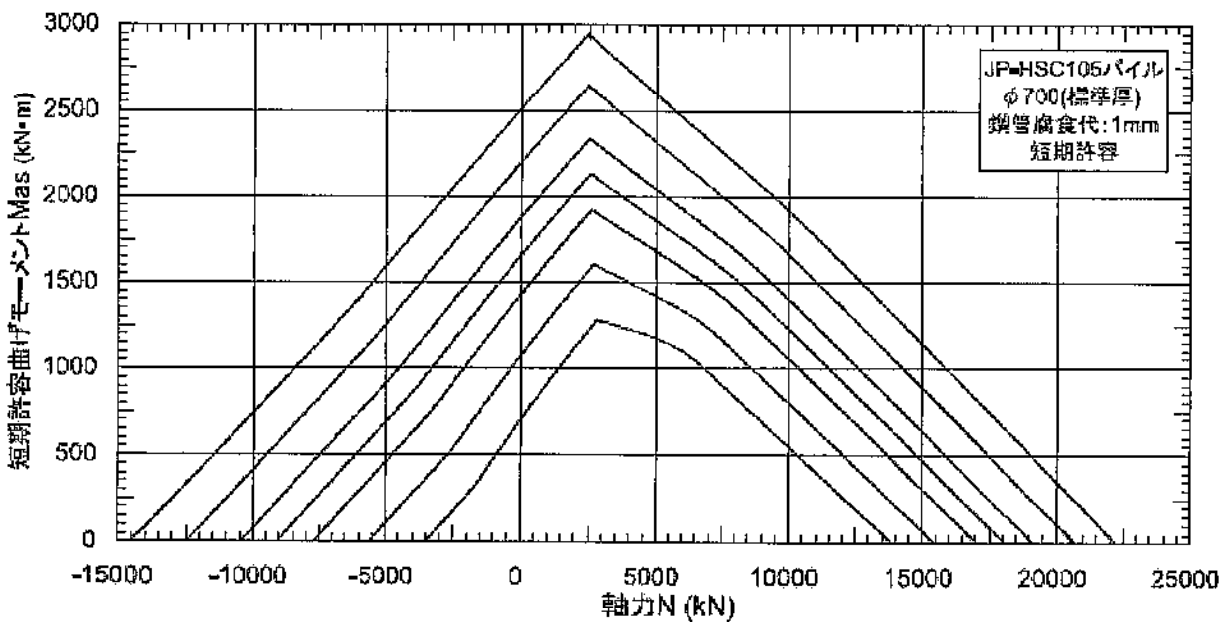
鋼管厚 (mm)
 ts=16
 ts=14
 ts=12
 ts=9
 ts=6
 ts=4.5

SKK490 105N



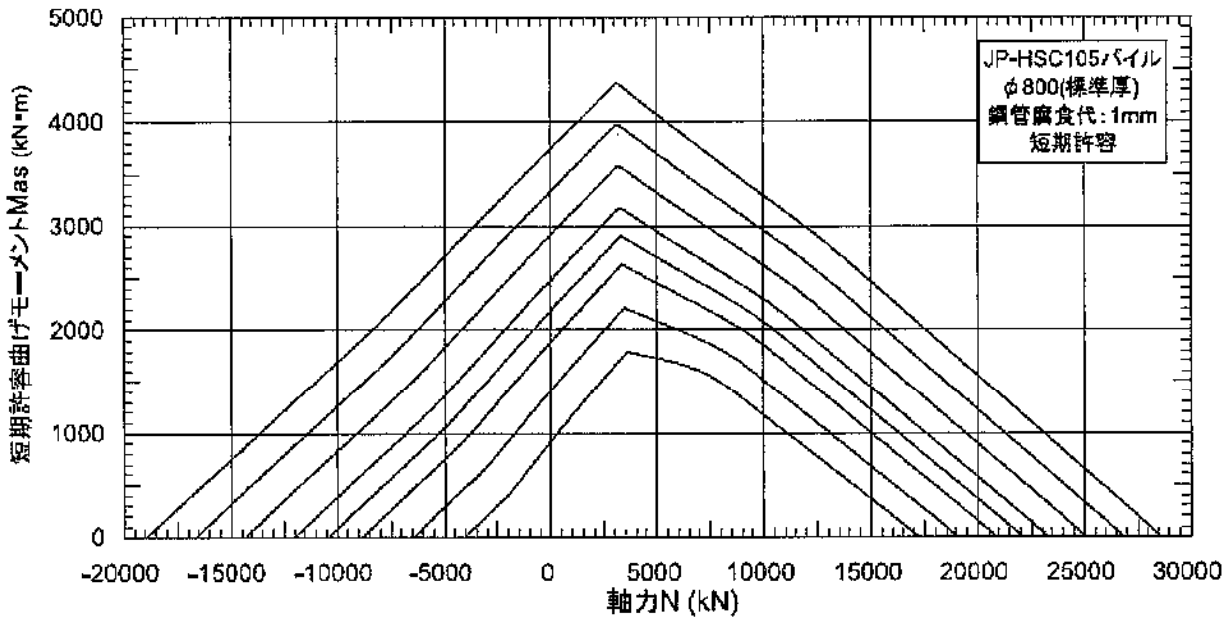
鋼管厚 (mm)
 ts=19
 ts=16
 ts=14
 ts=12
 ts=9
 ts=6
 ts=4.5

SKK490 105N



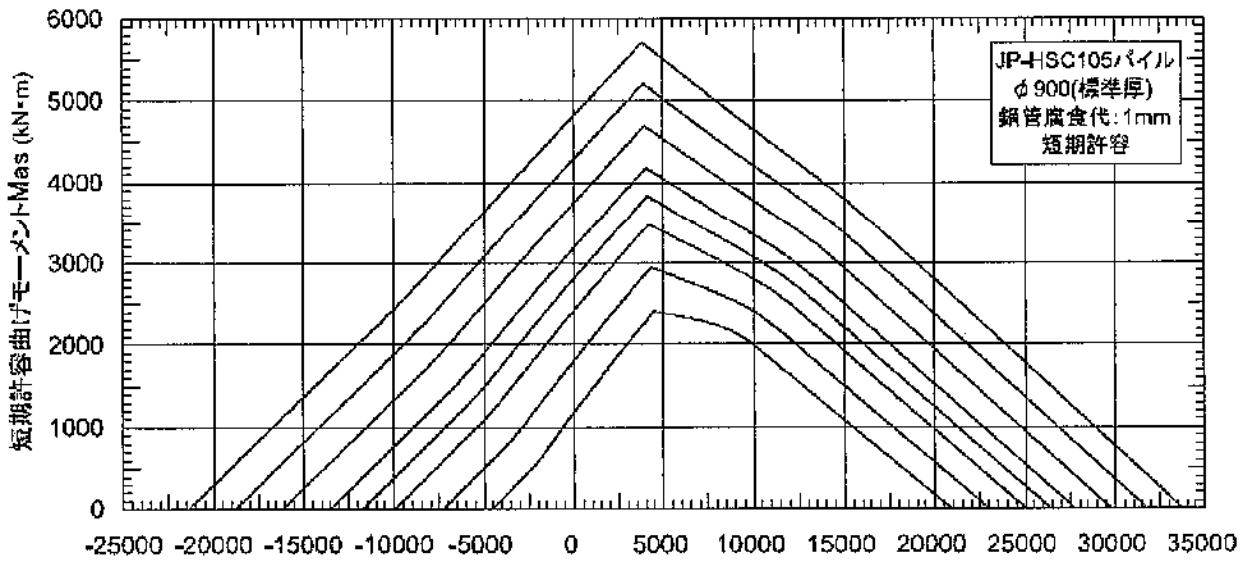
鋼管厚 (mm)
 ts=22
 ts=19
 ts=16
 ts=14
 ts=12
 ts=9
 ts=6

SKK490 105N



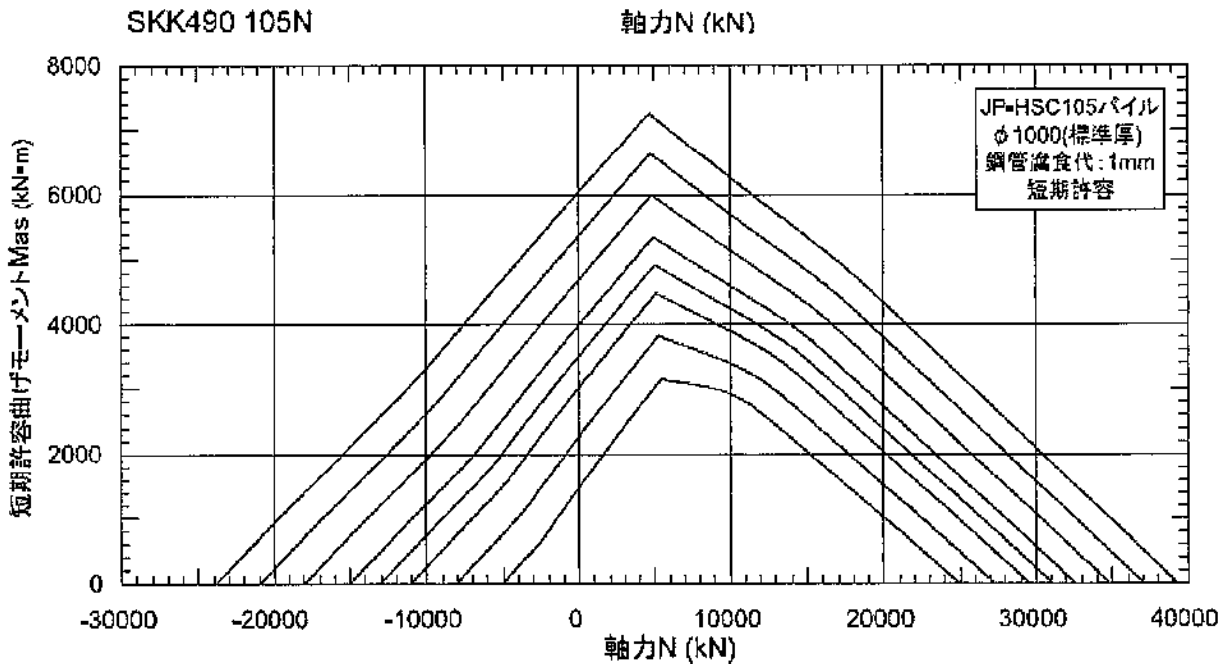
鋼管厚
(mm)
ts=25
ts=22
ts=19
ts=16
ts=14
ts=12
ts=9
ts=6

SKK490 105N



鋼管厚
(mm)
ts=25
ts=22
ts=19
ts=16
ts=14
ts=12
ts=9
ts=6

SKK490 105N



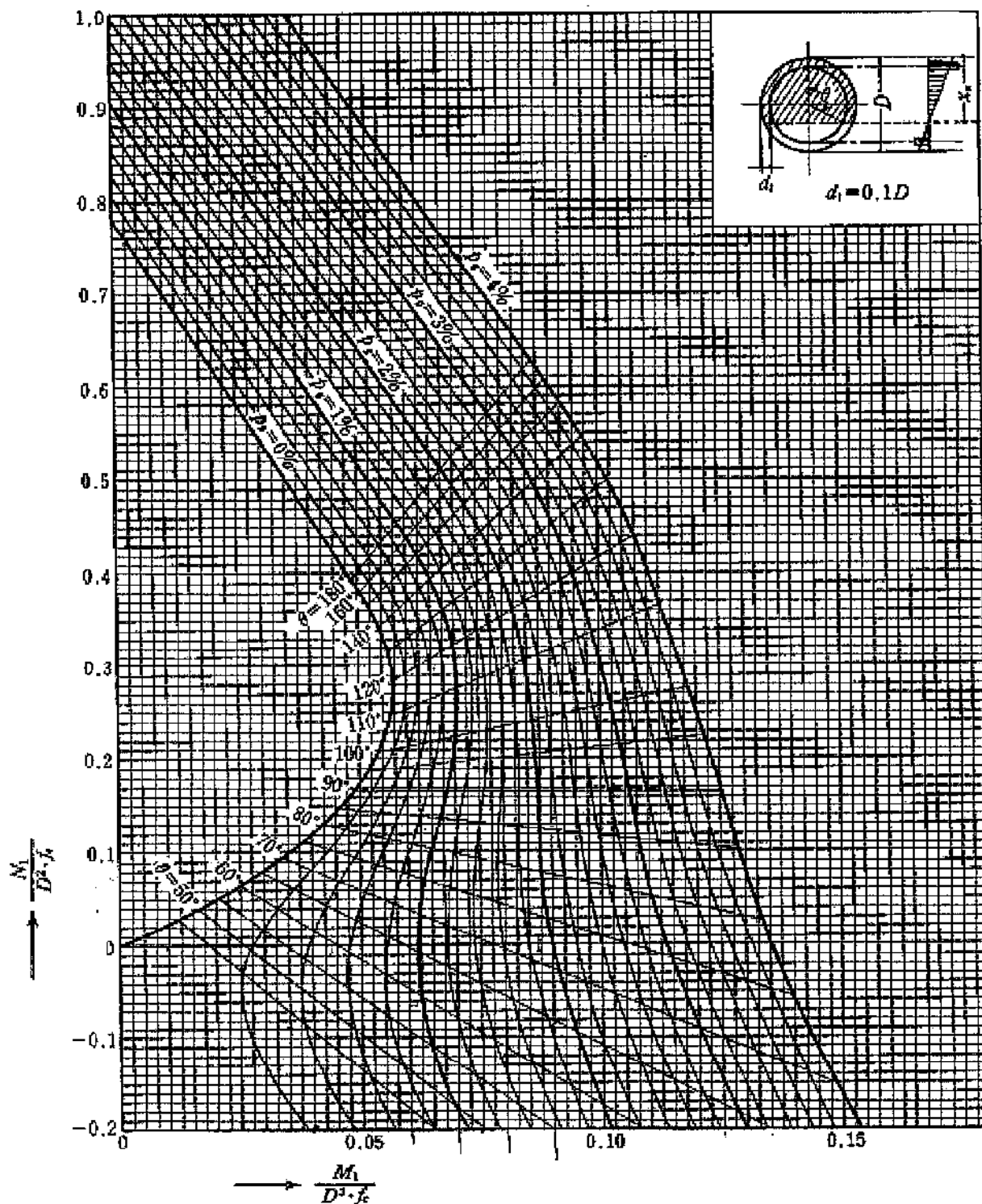
鋼管厚
(mm)
ts=25
ts=22
ts=19
ts=16
ts=14
ts=12
ts=9
ts=6

鉄筋の断面数量

異形棒鋼の断面積および周長表(太字は断面積 mm^2 、細字は周長 mm)

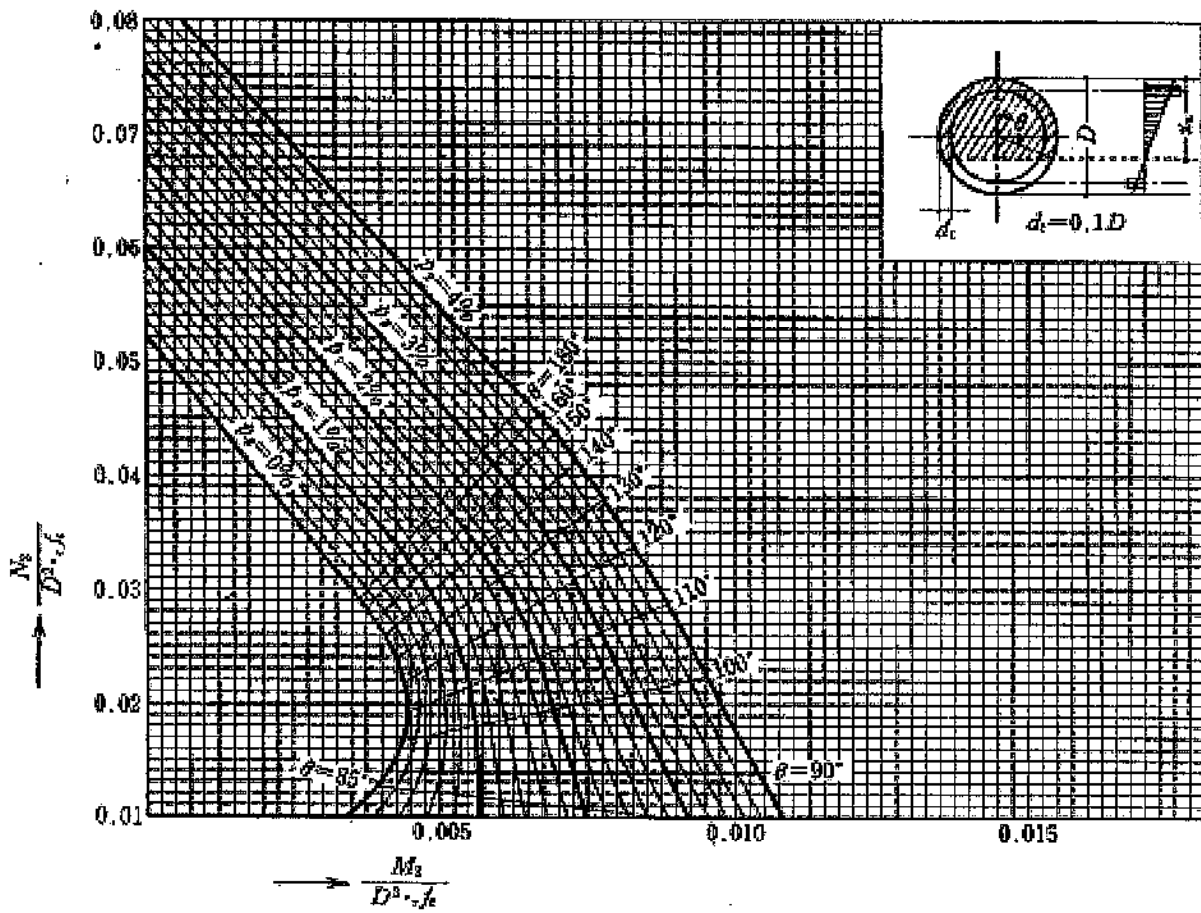
| 呼び名 | 単位質量 (kg/m) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|
| D6 | 0.249 | 32 | 64 | 96 | 128 | 160 | 192 | 224 | 256 | 288 | 320 |
| | | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 |
| D8 | 0.389 | 50 | 99 | 149 | 198 | 248 | 297 | 347 | 396 | 446 | 495 |
| | | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 |
| D10 | 0.560 | 71 | 143 | 214 | 285 | 357 | 428 | 499 | 570 | 642 | 713 |
| | | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 | 300 |
| D13 | 0.995 | 127 | 254 | 381 | 508 | 635 | 762 | 889 | 1016 | 1143 | 1270 |
| | | 40 | 80 | 120 | 160 | 200 | 240 | 280 | 320 | 360 | 400 |
| D16 | 1.56 | 199 | 398 | 597 | 796 | 995 | 1194 | 1393 | 1592 | 1791 | 1990 |
| | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| D19 | 2.25 | 287 | 574 | 861 | 1148 | 1435 | 1722 | 2009 | 2296 | 2583 | 2870 |
| | | 60 | 120 | 180 | 240 | 300 | 360 | 420 | 480 | 540 | 600 |
| D22 | 3.04 | 387 | 774 | 1161 | 1548 | 1935 | 2322 | 2709 | 3096 | 3483 | 3870 |
| | | 70 | 140 | 210 | 280 | 350 | 420 | 490 | 560 | 630 | 700 |
| D25 | 3.98 | 507 | 1014 | 1521 | 2028 | 2535 | 3042 | 3549 | 4056 | 4563 | 5070 |
| | | 80 | 160 | 240 | 320 | 400 | 480 | 560 | 640 | 720 | 800 |
| D29 | 5.04 | 642 | 1284 | 1926 | 2568 | 3210 | 3852 | 4494 | 5136 | 5778 | 6420 |
| | | 90 | 180 | 270 | 360 | 450 | 540 | 630 | 720 | 810 | 900 |
| D32 | 6.23 | 794 | 1588 | 2382 | 3176 | 3970 | 4764 | 5558 | 6352 | 7146 | 7940 |
| | | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| D35 | 7.51 | 957 | 1914 | 2871 | 3828 | 4785 | 5742 | 6699 | 7656 | 8613 | 9570 |
| | | 110 | 220 | 330 | 440 | 550 | 660 | 770 | 880 | 990 | 1100 |
| D38 | 8.95 | 1140 | 2280 | 3420 | 4560 | 5700 | 6840 | 7980 | 9120 | 10260 | 11400 |
| | | 120 | 240 | 360 | 480 | 600 | 720 | 840 | 960 | 1080 | 1200 |
| D41 | 10.5 | 1340 | 2680 | 4020 | 5360 | 6700 | 8040 | 9380 | 10720 | 12060 | 13400 |
| | | 130 | 260 | 390 | 520 | 650 | 780 | 910 | 1040 | 1170 | 1300 |

RC円形断面柱計算図表



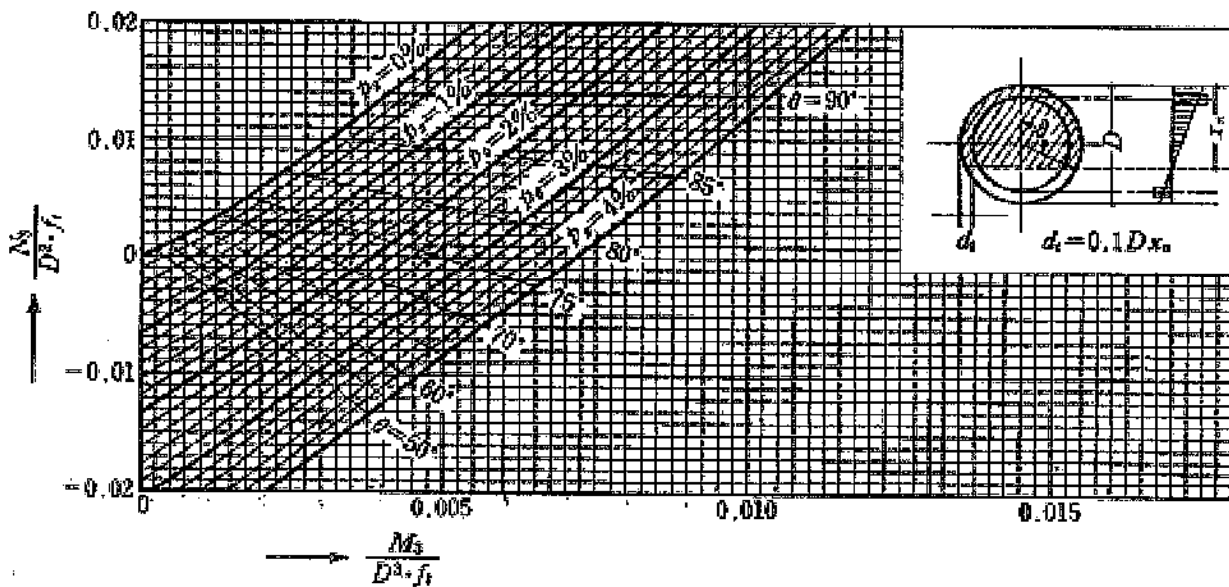
$p_s = (\text{鉄筋全断面積}) / (\text{コンクリート全断面積}), n = 15$

図 15.3(a) 円形断面柱 (コンクリートで耐力が決まる場合)



$p_s = (\text{鉄筋全断面積}) / (\text{コンクリート全断面積}), n=15$

図 15.3(b) 円形断面柱 (圧縮鉄筋で耐力の決まる場合)



$p_s = (\text{鉄筋全断面積}) / (\text{コンクリート全断面積}), n=15$

図 15.3(c) 円形断面柱 (引張鉄筋で耐力の決まる場合)