

Composite floor decking with trapezoidal section

Cofraplus® 77

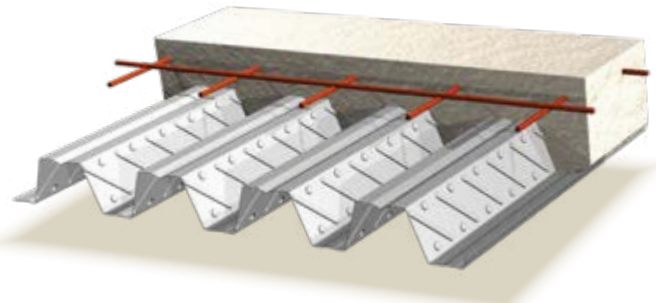


Cofrastra® 77 is a trapezoidal profile sheet with lateral embossments at its web intended to realise composite slabs.

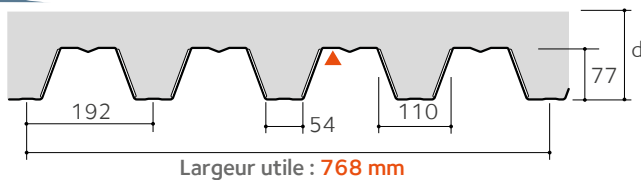
The embossments ensure the longitudinal shear bond between the concrete and the steel profile which acts than as additional reinforcement to the slab construction.

The profile serves as formwork in the temporary phase and allows savings to be made on the low reinforcement layer and on the self-weight of the slab construction.

A multi-use profile, Cofraplus® 77 is suitable for all types of construction.



▲ Coated face



CE - Marking

French technical approval : DTA No. 3/15-823

| Characteristics of the base material | | Norms |
|--------------------------------------|--------------------------------|---|
| Steel grade | S 350 GD | EN 10346 |
| Type of corrosion protection | Galvanised steel ZM 175 | P 34-310 ETPM ZMevolution or AbZ Z-30.11-61 |
| | Galvanised coated steel ZM 175 | P 34-301 EN 10169+A1 |
| Organic coating | | Norms |
| Hairplus 25 µm | Category IIIa | P 34-310 |
| | Category CPi3 | EN 10169+A1 |
| Other coatings | On demand | |

| Characteristics | Nominal thickness of the profile sheet [mm] | | |
|--|---|--------|---------|
| | 0,75 | 0,88 | 1,00 |
| Weight [kg/m ²] | 9,20 | 10,80 | 12,30 |
| Cross section A_p [mm ² /m] | 1 146 | 1 356 | 1 550 |
| Effective inertia I_{eff} [mm ⁴ /m] | 78 300 | 94 700 | 109 800 |
| Height of neutral axis [mm] | 42,70 | 42,70 | 42,70 |
| Modulus of inertia [mm ³ /m] | 18 340 | 22 180 | 25 710 |

Nominal concrete consumption

| | Thickness of the slab [cm] | | | | | | | | | | | | |
|---|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 24 | 26 | 28 |
| Concrete volume [l/m ²] | 86 | 96 | 106 | 116 | 126 | 136 | 146 | 156 | 166 | 176 | 196 | 216 | 236 |
| Theoretical weight of the composite slab [kg/m ²] | 215 | 240 | 265 | 290 | 315 | 340 | 365 | 390 | 415 | 440 | 490 | 540 | 590 |

Concrete density 2500 kg/m³

Maximum recommended slab thickness d = 28 cm

The Cofra® 5 web based software application

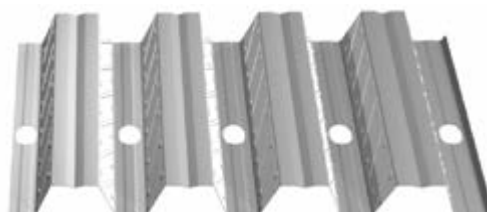
will give detailed information about the required reinforcement according to the project specifications.



www.arcelormittal.com/cofra5

Cofraplus® 77 P:

Pre-punched version, compatible with shear connectors, welded in advance or in shop to the composite beams.



Fire resistance

| Thickness of the slab [cm] | REI [min] | | | |
|----------------------------|-----------|----|----|-----|
| | 30 | 60 | 90 | 120 |
| 13 | 13 | 13 | 15 | 17 |

REI: fire protection rating of the raw composite slab

The minimum thickness is required to comply with the temperature criterion (I) on the non-fire exposed side.

According to EN1994-1-2 4.3.2, Cofraplus® 77 composite floors are rated REI 30 even without specific reinforcement in the ribs. For higher fire resistance classes, additional reinforcement bars are required. These are positioned in the ribs of the profile. Their size is determined by calculation (see Cofra5).

Sound insulation

The acoustic behaviour of a raw composite slab is determined by its mass. Values calculated by modelling – study report CSTB No. AC15-26054708

| R _w [dB] | Thickness of the slab [cm] | | | | | | | | | |
|---------------------|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| (C;Ctr) [dB] | (-1;-5) | (-1;-6) | (-1;-6) | (-2;-6) | (-2;-6) | (-1;-6) | (-1;-7) | (-2;-7) | (-1;-6) | (-2;-6) |

Structural performance

Acceptable unweighted q values with g' = 0 in kg/m²

A calculation using Cofra 5 might optimise the design according to the project requirements

Single span 

| Thickness of the slab [cm] | Span [m] | | | | | | | | | | | | | | | | | | | | |
|----------------------------|------------------|------|------|------|------|------|------|------|------|------|------|------|------|---------------|------|------|------|------|------|------|------|
| | 2,00 | 2,10 | 2,20 | 2,30 | 2,40 | 2,50 | 2,60 | 2,70 | 2,80 | 2,90 | 3,00 | 3,10 | 3,20 | 3,30 | 3,40 | 3,50 | 3,60 | 3,70 | 3,80 | 3,90 | 4,00 |
| 22 | 1435 | 1293 | 1169 | 1060 | 963 | 1019 | 1048 | 960 | 666 | 609 | 557 | 509 | 466 | 426 | 389 | 355 | 323 | 294 | 266 | 241 | 217 |
| 21 | 1419 | 1279 | 1156 | 1048 | 953 | 1011 | 923 | 953 | 660 | 604 | 553 | 506 | 463 | 424 | 388 | 354 | 323 | 295 | 268 | 243 | 220 |
| 20 | 1404 | 1266 | 1145 | 1038 | 944 | 860 | 917 | 947 | 870 | 600 | 550 | 504 | 462 | 424 | 388 | 355 | 325 | 297 | 270 | 246 | 223 |
| 19 | 1388 | 1251 | 1132 | 1027 | 934 | 851 | 909 | 833 | 865 | 596 | 546 | 501 | 460 | 422 | 387 | 355 | 325 | 298 | 272 | 248 | 226 |
| 18 | 1372 | 1238 | 1120 | 1016 | 925 | 843 | 770 | 827 | 760 | 792 | 544 | 499 | 459 | 422 | 387 | 356 | 327 | 300 | 274 | 251 | 229 |
| 17 | 1356 | 1223 | 1107 | 1005 | 915 | 834 | 763 | 698 | 754 | 787 | 726 | 496 | 457 | 420 | 387 | 356 | 327 | 301 | 276 | 253 | 232 |
| 16 | 1341 | 1210 | 1095 | 995 | 906 | 827 | 756 | 693 | 749 | 690 | 723 | 494 | 455 | 420 | 387 | 356 | 328 | 302 | 278 | 256 | 235 |
| 15 | 1325 | 1196 | 1083 | 983 | 896 | 818 | 749 | 686 | 630 | 685 | 632 | 666 | 453 | 418 | 386 | 356 | 329 | 303 | 280 | 258 | 238 |
| 14 | 1310 | 1182 | 1071 | 973 | 887 | 810 | 742 | 681 | 626 | 576 | 630 | 582 | 615 | 418 | 386 | 357 | 330 | 305 | 282 | 261 | 241 |
| 13 | 1294 | 1168 | 1058 | 962 | 877 | 802 | 734 | 674 | 620 | 571 | 527 | 579 | 537 | 569 | 385 | 357 | 331 | 306 | 284 | 263 | 244 |
| | Without propping | | | | | | | | | | | | | With propping | | | | | | | |

Multiple spans  with L1 = L2 and prop width 100 mm

| Thickness of the slab [cm] | span [m] | | | | | | | | | | | | | | | | | | | | |
|----------------------------|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 2,00 | 2,10 | 2,20 | 2,30 | 2,40 | 2,50 | 2,60 | 2,70 | 2,80 | 2,90 | 3,00 | 3,10 | 3,20 | 3,30 | 3,40 | 3,50 | 3,60 | 3,70 | 3,80 | 3,90 | 4,00 |
| 22 | 1906 | 1733 | 1582 | 1448 | 1330 | 1224 | 1130 | 1045 | 1107 | 1028 | 956 | 890 | 824 | 863 | 807 | 755 | 550 | 514 | 481 | 450 | 421 |
| 21 | 1878 | 1707 | 1558 | 1426 | 1309 | 1205 | 1112 | 1029 | 953 | 1014 | 943 | 878 | 819 | 765 | 798 | 747 | 700 | 507 | 474 | 444 | 416 |
| 21 | 1851 | 1682 | 1535 | 1405 | 1290 | 1187 | 1096 | 1013 | 939 | 1001 | 931 | 867 | 809 | 755 | 789 | 739 | 693 | 501 | 469 | 439 | 411 |
| 19 | 1823 | 1657 | 1511 | 1383 | 1269 | 1168 | 1078 | 997 | 924 | 857 | 918 | 855 | 798 | 745 | 697 | 730 | 685 | 643 | 462 | 433 | 406 |
| 18 | 1796 | 1632 | 1488 | 1362 | 1250 | 1150 | 1061 | 982 | 910 | 844 | 785 | 844 | 788 | 736 | 688 | 645 | 678 | 636 | 457 | 428 | 402 |
| 17 | 1768 | 1606 | 1464 | 1340 | 1229 | 1131 | 1044 | 965 | 895 | 830 | 772 | 719 | 777 | 726 | 679 | 636 | 596 | 559 | 591 | 422 | 396 |
| 16 | 1741 | 1581 | 1441 | 1318 | 1210 | 1113 | 1027 | 950 | 880 | 817 | 760 | 708 | 661 | 717 | 671 | 628 | 589 | 553 | 586 | 551 | 392 |
| 15 | 1713 | 1555 | 1417 | 1296 | 1189 | 1095 | 1010 | 934 | 865 | 804 | 747 | 696 | 650 | 607 | 568 | 620 | 582 | 546 | 513 | 545 | 514 |
| 14 | 1677 | 1530 | 1394 | 1275 | 1170 | 1076 | 993 | 918 | 851 | 790 | 735 | 685 | 640 | 598 | 559 | 624 | 575 | 540 | 508 | 478 | 509 |
| 13 | 1503 | 1422 | 1348 | 1253 | 1149 | 1058 | 976 | 902 | 836 | 777 | 723 | 673 | 629 | 588 | 550 | 615 | 483 | 533 | 501 | 472 | 445 |
| | Without propping | | | | | | | | | | | | | | | | | | | | |

Assumptions

- Concrete C25/30 (Density 2500 kg/m³)
- Fire resistance REI30
- Deflection while pouring L / 180
- Deflection in service L [cm] / 350 if L < 3.5 m or (0.5 cm + L / 700) if L > 3.5 m

| Key | Thickness [mm] |
|-------------------------------|----------------|
| Installation without propping | 0,75 |
| | 0,88 |
| | 1,00 |
| With propping | 0,75 |