



Structural Foam Backfill

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Product Description

ShieldFoam PLF (Pole Lock Foam) is a closed cell polyurethane foam designed as a structural foundation replacement for concrete backfill of poles and posts. It can be used to set new poles in the ground, or to straighten existing poles. It is a cost effective, durable alternative to concrete backfill that still allows easy access for inspections of the pole in the below-ground section and requires only 15 minutes to set before conductor stringing.

For poles, we recommend finishing the foam approx. 1m from the surface. Using the foam in the bottom half of the embedment depth has been shown to provide the most benefit structurally, and it does not affect regular inspection techniques or pole durability.

Application Areas

- Streetlights
- Utility Poles
- Sports lighting
- Re-levelling poles or pad footings
- Pole home footings
- Fencing
- Any direct buried post or pole

Features & Benefits

- No tamping required.
- 15-minute set to approx. 3x strength of tamped backfill.
- Expansion rate of approx. 13x its liquid volume.
- Moisture insensitive (remove standing water only).
- Designed in Australia, manufactured in NZ.
- Bonds to all materials and fills checks, splits, and irregularities, providing improved durability compared with concrete backfill.
- Increases productivity, no more waiting for concrete backfill to cure.
- Increases safety – reduces risk of injury from backfill tamping.
- Handy pre-measured kit sizes.
- Works with minimal clearance to the surrounding soils.

Properties

| | |
|--|----------------------------|
| Color | Beige |
| Odor | None |
| Specific Gravity – liquid form | Side A: 1.12, Side B: 1.24 |
| Solids by volume | 100% |
| Fire performance | Self-extinguishing |
| Toxicity | None |
| VOC/VOS Content | 0.0 g/ml |
| Compressive Strength | > 750 kPa |
| Closed cell content (ASTM D-1940) | > 90% |
| Water absorption (ASTM D2842) | < 0.5% |
| Time to start foaming | 1.5-4 min (temp dependent) |
| Time to end of foaming | 2.5-6 min (temp dependent) |
| 50% cure time | ~15 min |
| 75% cure time | ~1 hour |
| Full cure | 24 hours |

Packaging

The following packages are our standard sizes. Other sizes are only available subject to appropriate lead time, packaging constraints and minimum orders.

PLF 50 – 50L of expanded foam (0.05 m²)

PLF 100 – 100L of expanded foam (0.1 m²)

PLF 150 – 150L of expanded foam (0.15 m²)

PLF 200 – 200L of expanded foam (0.2 m²)

Storage & Handling

Storage at room temperature (15-25°C) is recommended. Storage below 5°C and above 38°C is not recommended.

Under the recommended storage conditions and in properly sealed containers, ShieldFoam PLF has a nominal storage life of 18 months.

Mixing / Application Instructions

Do not dilute under any circumstances. Determine the appropriate kit size for the hole diameter and pole diameter and depth of foam that is required. We recommended that the depth be more than half the pole embedment depth and less than the embedment depth minus 600mm. Ideally, try to have the foam finish 0.6-1m below ground line. In some case the foam can be applied to finish above ground line, in which case, trim any excess to ensure it slopes away from the pole.

Put the kit near the hole to be filled. Shake Part B to mix for about 30s. Pour Part B into Part A container. Mix well with a high-speed drill (~700rpm) and 'jiffy' mixer until the colour is consistent with no streaks (normally 45+ seconds). It is recommended to continue mixing until the material begins to rise, but not required as long as it is thoroughly mixed.

Once the product starts to rise, pour it into the hole, walking around the circumference as you pour to ensure even distribution. Avoid getting it on the pole near ground line (but it is of no consequence if some cannot be avoided).

Hold pole in position for at least 5 minutes, preferably 15 minutes.

Do not screw the lid back on the Part B. Atmospheric moisture will react with the remaining contents (or add a little bit of water to speed it up) to form an inert solid. Dispose of as standard inert waste.

Fill the remaining depth with site spoil or controlled fill for the best balance between foundation capacity, durability, and ease of inspection.

This technique has been shown through large scale testing to give excellent foundation strength (less than 50% of the rotation after 24 hours compared to tamped backfill with more than 3months consolidation), but still gives the ability to inspect the pole at and around ground line.

Inspection of poles below the material can be done by drilling straight through the material and filling the hole with can-grade polyurethane foam or a polyurethane sealant. Please contact your ShieldFoam distributor if you require further information.

Volume Tables

- See Page 3 and 4

DISCLAIMER

The information provided herein, especially recommendations for the usage and the application of our products, is based upon our knowledge and experience. Due to different materials and equipment used, as well as varying working conditions and environments beyond our control we strictly recommend carrying out intensive trials to test the suitability of our products regarding the required processes and applications. This data sheet is provided free of charge, and we do not accept any liability regarding the above information or regarding any verbal recommendation, except for cases where we are liable of gross negligence or false intention.

Volume Tables

Select the table for the diameter of the hole, pick the closest average pole diameter below ground, then read across to the depth of foam (hole/embedment depth for full height foam, or just the bottom 0.5-1m say) to give the liters of foam required.

| Litres of expanded foam required per hole | | | | | | | | | | | | | | | |
|---|----------------------------|-----|-----|------|----|-----|-----|------|-----|-----|------|-----|-----|-----|-----|
| 300mm Dia. Hole | Required depth of foam (m) | | | | | | | | | | | | | | |
| Avg. Pole Dia. Below Ground (mm) | 0.3 | 0.4 | 0.5 | 0.75 | 1 | 1.5 | 2 | 2.15 | 2.3 | 2.5 | 2.75 | 3 | 3.5 | 4 | 4.5 |
| 100 | 19 | 26 | 32 | 48 | 63 | 95 | 126 | 136 | 145 | 158 | 173 | 189 | 220 | 252 | 283 |
| 125 | 18 | 24 | 30 | 44 | 59 | 88 | 117 | 126 | 135 | 147 | 161 | 176 | 205 | 234 | 263 |
| 150 | 16 | 22 | 27 | 40 | 54 | 80 | 107 | 114 | 122 | 133 | 146 | 160 | 186 | 213 | 239 |
| 175 | 14 | 19 | 24 | 35 | 47 | 70 | 94 | 101 | 108 | 117 | 129 | 140 | 164 | 187 | 210 |
| 200 | 12 | 16 | 20 | 30 | 40 | 59 | 79 | 85 | 91 | 99 | 108 | 118 | 138 | 158 | 177 |
| 225 | 10 | 13 | 16 | 24 | 31 | 47 | 62 | 67 | 72 | 78 | 86 | 93 | 109 | 124 | 140 |

| Litres of expanded foam required per hole | | | | | | | | | | | | | | | |
|---|----------------------------|-----|-----|------|-----|-----|-----|------|-----|-----|------|-----|-----|-----|-----|
| 400mm Dia. Hole | Required depth of foam (m) | | | | | | | | | | | | | | |
| Avg. Pole Dia. Below Ground (mm) | 0.3 | 0.4 | 0.5 | 0.75 | 1 | 1.5 | 2 | 2.15 | 2.3 | 2.5 | 2.75 | 3 | 3.5 | 4 | 4.5 |
| 150 | 33 | 44 | 54 | 81 | 108 | 162 | 216 | 233 | 249 | 270 | 297 | 324 | 378 | 432 | 486 |
| 175 | 31 | 41 | 51 | 77 | 102 | 153 | 204 | 219 | 234 | 255 | 280 | 305 | 356 | 407 | 458 |
| 200 | 29 | 38 | 48 | 71 | 95 | 142 | 189 | 203 | 217 | 236 | 260 | 283 | 330 | 377 | 425 |
| 225 | 26 | 35 | 43 | 65 | 86 | 129 | 172 | 185 | 198 | 215 | 237 | 258 | 301 | 344 | 387 |
| 250 | 23 | 31 | 39 | 58 | 77 | 115 | 154 | 165 | 177 | 192 | 211 | 230 | 269 | 307 | 345 |
| 275 | 20 | 27 | 34 | 50 | 67 | 100 | 133 | 143 | 153 | 166 | 183 | 199 | 232 | 266 | 299 |
| 300 | 17 | 22 | 28 | 42 | 55 | 83 | 110 | 119 | 127 | 138 | 152 | 165 | 193 | 220 | 248 |
| 325 | 13 | 18 | 22 | 33 | 43 | 65 | 86 | 92 | 99 | 107 | 118 | 129 | 150 | 171 | 193 |

| Litres of expanded foam required per hole | | | | | | | | | | | | | | | |
|---|----------------------------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|-----|
| 450mm Dia. Hole | Required depth of foam (m) | | | | | | | | | | | | | | |
| Avg. Pole Dia. Below Ground (mm) | 1 | 1.4 | 1.55 | 1.7 | 1.85 | 2 | 2.15 | 2.3 | 2.45 | 2.6 | 2.75 | 2.9 | 3.05 | 3.5 | 4 |
| 200 | 128 | 179 | 198 | 217 | 237 | 256 | 275 | 294 | 313 | 332 | 351 | 371 | 390 | 447 | 511 |
| 225 | 120 | 167 | 185 | 203 | 221 | 239 | 257 | 275 | 293 | 311 | 329 | 346 | 364 | 418 | 478 |
| 250 | 110 | 154 | 171 | 187 | 204 | 220 | 237 | 253 | 270 | 286 | 303 | 319 | 336 | 385 | 440 |
| 275 | 100 | 140 | 155 | 170 | 185 | 200 | 215 | 230 | 245 | 260 | 275 | 289 | 304 | 349 | 399 |
| 300 | 89 | 124 | 137 | 151 | 164 | 177 | 190 | 204 | 217 | 230 | 243 | 257 | 270 | 310 | 354 |
| 325 | 77 | 107 | 118 | 130 | 141 | 153 | 164 | 175 | 187 | 198 | 210 | 221 | 233 | 267 | 305 |
| 350 | 63 | 88 | 98 | 107 | 117 | 126 | 136 | 145 | 154 | 164 | 173 | 183 | 192 | 220 | 252 |
| 375 | 49 | 69 | 76 | 83 | 90 | 98 | 105 | 112 | 120 | 127 | 134 | 141 | 149 | 171 | 195 |

| Litres of expanded foam required per hole | | | | | | | | | | | | | | | |
|---|----------------------------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|-----|
| 600mm Dia. Hole | Required depth of foam (m) | | | | | | | | | | | | | | |
| Avg. Pole Dia. Below Ground (mm) | 1 | 1.4 | 1.55 | 1.7 | 1.85 | 2 | 2.15 | 2.3 | 2.45 | 2.6 | 2.75 | 2.9 | 3.05 | 3.5 | 4 |
| 275 | 224 | 313 | 347 | 380 | 414 | 447 | 481 | 514 | 548 | 581 | 615 | 648 | 682 | 782 | 894 |
| 300 | 213 | 297 | 329 | 361 | 393 | 425 | 456 | 488 | 520 | 552 | 584 | 615 | 647 | 743 | 849 |
| 325 | 200 | 280 | 310 | 340 | 370 | 400 | 430 | 460 | 490 | 520 | 550 | 580 | 610 | 700 | 800 |
| 350 | 187 | 262 | 290 | 318 | 346 | 374 | 402 | 430 | 458 | 485 | 513 | 541 | 569 | 653 | 747 |
| 375 | 173 | 242 | 268 | 293 | 319 | 345 | 371 | 397 | 423 | 448 | 474 | 500 | 526 | 604 | 690 |
| 400 | 158 | 220 | 244 | 268 | 291 | 315 | 338 | 362 | 385 | 409 | 432 | 456 | 480 | 550 | 629 |
| 425 | 141 | 198 | 219 | 240 | 261 | 282 | 303 | 325 | 346 | 367 | 388 | 409 | 430 | 494 | 564 |
| 450 | 124 | 174 | 192 | 211 | 229 | 248 | 266 | 285 | 304 | 322 | 341 | 359 | 378 | 433 | 495 |
| 475 | 106 | 148 | 164 | 180 | 196 | 212 | 227 | 243 | 259 | 275 | 291 | 307 | 322 | 370 | 423 |
| 500 | 87 | 121 | 134 | 147 | 160 | 173 | 186 | 199 | 212 | 225 | 238 | 251 | 264 | 303 | 346 |
| 525 | 67 | 93 | 103 | 113 | 123 | 133 | 143 | 153 | 163 | 173 | 183 | 193 | 203 | 232 | 266 |

| Litres of expanded foam required per hole | | | | | | | | | | | | | | | |
|--|----------------------------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|------|------|
| 750mm Dia. Hole Avg. Pole Dia. Below Ground (mm) | Required depth of foam (m) | | | | | | | | | | | | | | |
| | 1 | 1.4 | 1.55 | 1.7 | 1.85 | 2 | 2.15 | 2.3 | 2.45 | 2.6 | 2.75 | 2.9 | 3.05 | 3.5 | 4 |
| 400 | 317 | 443 | 490 | 538 | 585 | 633 | 680 | 728 | 775 | 822 | 870 | 917 | 965 | 1107 | 1265 |
| 425 | 300 | 420 | 465 | 510 | 555 | 600 | 645 | 690 | 735 | 780 | 825 | 870 | 915 | 1050 | 1200 |
| 450 | 283 | 396 | 439 | 481 | 524 | 566 | 608 | 651 | 693 | 736 | 778 | 820 | 863 | 990 | 1131 |
| 475 | 265 | 371 | 411 | 450 | 490 | 530 | 569 | 609 | 649 | 688 | 728 | 768 | 807 | 927 | 1059 |
| 500 | 246 | 344 | 381 | 418 | 455 | 491 | 528 | 565 | 602 | 639 | 675 | 712 | 749 | 860 | 982 |
| 525 | 226 | 316 | 350 | 384 | 417 | 451 | 485 | 519 | 553 | 586 | 620 | 654 | 688 | 789 | 902 |
| 550 | 205 | 286 | 317 | 348 | 378 | 409 | 440 | 470 | 501 | 531 | 562 | 593 | 623 | 715 | 817 |
| 575 | 183 | 255 | 283 | 310 | 337 | 365 | 392 | 419 | 447 | 474 | 501 | 529 | 556 | 638 | 729 |
| 600 | 160 | 223 | 247 | 271 | 295 | 319 | 342 | 366 | 390 | 414 | 438 | 462 | 486 | 557 | 637 |
| 625 | 135 | 189 | 210 | 230 | 250 | 270 | 291 | 311 | 331 | 351 | 372 | 392 | 412 | 473 | 540 |
| 650 | 110 | 154 | 171 | 187 | 204 | 220 | 237 | 253 | 270 | 286 | 303 | 319 | 336 | 385 | 440 |

| Litres of expanded foam required per hole | | | | | | | | | | | | | | | |
|--|----------------------------|-----|------|-----|------|-----|------|------|------|------|------|------|------|------|------|
| 900mm Dia. Hole Avg. Pole Dia. Below Ground (mm) | Required depth of foam (m) | | | | | | | | | | | | | | |
| | 1 | 1.4 | 1.55 | 1.7 | 1.85 | 2 | 2.15 | 2.3 | 2.45 | 2.6 | 2.75 | 2.9 | 3.05 | 3.5 | 4 |
| 475 | 459 | 643 | 712 | 781 | 850 | 918 | 987 | 1056 | 1125 | 1194 | 1263 | 1332 | 1400 | 1607 | 1836 |
| 500 | 440 | 616 | 682 | 748 | 814 | 880 | 946 | 1012 | 1078 | 1144 | 1210 | 1276 | 1342 | 1540 | 1760 |
| 525 | 420 | 588 | 651 | 714 | 777 | 840 | 903 | 966 | 1029 | 1092 | 1155 | 1218 | 1281 | 1469 | 1679 |
| 550 | 399 | 559 | 618 | 678 | 738 | 798 | 857 | 917 | 977 | 1037 | 1097 | 1156 | 1216 | 1396 | 1595 |
| 575 | 377 | 528 | 584 | 641 | 697 | 754 | 810 | 866 | 923 | 979 | 1036 | 1092 | 1149 | 1318 | 1507 |
| 600 | 354 | 495 | 548 | 601 | 654 | 707 | 760 | 813 | 866 | 919 | 972 | 1025 | 1078 | 1238 | 1414 |
| 625 | 330 | 462 | 511 | 560 | 610 | 659 | 709 | 758 | 807 | 857 | 906 | 956 | 1005 | 1153 | 1318 |
| 650 | 305 | 427 | 472 | 518 | 564 | 609 | 655 | 700 | 746 | 792 | 837 | 883 | 929 | 1066 | 1218 |
| 675 | 279 | 390 | 432 | 474 | 515 | 557 | 599 | 641 | 682 | 724 | 766 | 808 | 849 | 975 | 1114 |
| 700 | 252 | 352 | 390 | 428 | 465 | 503 | 541 | 579 | 616 | 654 | 692 | 729 | 767 | 880 | 1006 |

| Litres of expanded foam required per hole | | | | | | | | | | | | | | | |
|---|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1200mm Dia. Hole Avg. Pole Dia. Below Ground (mm) | Required depth of foam (m) | | | | | | | | | | | | | | |
| | 1 | 1.4 | 1.55 | 1.7 | 1.85 | 2 | 2.15 | 2.3 | 2.45 | 2.6 | 2.75 | 2.9 | 3.05 | 3.5 | 4 |
| 525 | 915 | 1281 | 1418 | 1555 | 1692 | 1829 | 1967 | 2104 | 2241 | 2378 | 2515 | 2653 | 2790 | 3201 | 3658 |
| 550 | 894 | 1251 | 1385 | 1519 | 1653 | 1787 | 1921 | 2055 | 2189 | 2323 | 2457 | 2591 | 2725 | 3127 | 3574 |
| 575 | 872 | 1220 | 1351 | 1482 | 1612 | 1743 | 1874 | 2004 | 2135 | 2266 | 2397 | 2527 | 2658 | 3050 | 3486 |
| 600 | 849 | 1188 | 1315 | 1442 | 1570 | 1697 | 1824 | 1951 | 2079 | 2206 | 2333 | 2460 | 2588 | 2969 | 3393 |
| 625 | 825 | 1154 | 1278 | 1402 | 1525 | 1649 | 1772 | 1896 | 2020 | 2143 | 2267 | 2391 | 2514 | 2885 | 3297 |
| 650 | 800 | 1119 | 1239 | 1359 | 1479 | 1599 | 1719 | 1839 | 1958 | 2078 | 2198 | 2318 | 2438 | 2797 | 3197 |
| 675 | 774 | 1083 | 1199 | 1315 | 1431 | 1547 | 1663 | 1779 | 1895 | 2011 | 2127 | 2243 | 2359 | 2706 | 3093 |
| 700 | 747 | 1045 | 1157 | 1269 | 1381 | 1493 | 1605 | 1717 | 1829 | 1940 | 2052 | 2164 | 2276 | 2612 | 2985 |
| 750 | 690 | 965 | 1069 | 1172 | 1275 | 1379 | 1482 | 1586 | 1689 | 1792 | 1896 | 1999 | 2103 | 2413 | 2757 |
| 800 | 629 | 880 | 974 | 1069 | 1163 | 1257 | 1351 | 1446 | 1540 | 1634 | 1728 | 1823 | 1917 | 2200 | 2514 |
| 850 | 564 | 789 | 874 | 958 | 1043 | 1128 | 1212 | 1297 | 1381 | 1466 | 1550 | 1635 | 1719 | 1973 | 2255 |
| 900 | 495 | 693 | 767 | 842 | 916 | 990 | 1064 | 1139 | 1213 | 1287 | 1361 | 1435 | 1510 | 1732 | 1980 |
| 950 | 423 | 592 | 655 | 718 | 781 | 845 | 908 | 971 | 1035 | 1098 | 1161 | 1225 | 1288 | 1478 | 1689 |
| 1000 | 346 | 484 | 536 | 588 | 640 | 692 | 743 | 795 | 847 | 899 | 951 | 1003 | 1055 | 1210 | 1383 |
| 1050 | 266 | 372 | 411 | 451 | 491 | 531 | 570 | 610 | 650 | 690 | 729 | 769 | 809 | 928 | 1061 |