



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-leveling 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 dependant)
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