Composite floors decking with dovetail section

Cofrastra® 40

ArcelorMittal

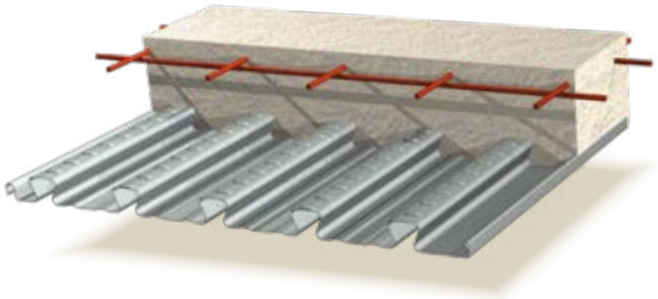
Cofrastra® 40 is a steel profile sheet with dovetail geometry intended to realise composite slabs

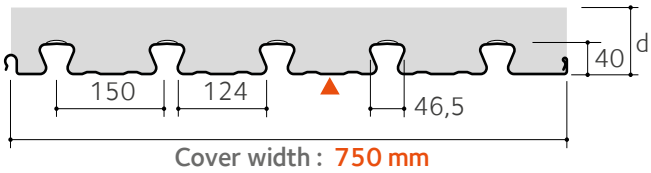
The longitudinal shear bond between the concrete and the profile realised by embossment and its dovetail section gives an additional reinforcement to the slab construction.

The profile serves as formwork while pouring the concrete and allows savings to be made on the lower reinforcement layer.

Cofrastra® 40 permits to build very slim and lightweight slabs, or quite massive structures, similar to standard reinforced concrete slabs using it more as lost shuttering.

Its dovetail geometry ensures a very good adhesion and the Cofrafix clip system allows to suspend building equipment, ducts or false ceilings ... without any dowels, pins or drilling.





Cover width : **750 mm**

Fire safety | Acoustic | Slim floor

▲ Coated face

CE - Marking
German technical approval: AbZ Z-16.1-22
French technical approval : DTA No. 3/15-801

Characteristics of the base material		Norms
Steel grade	S 350 GD	EN 10346
corrosion protection	Galvanised steel ZM 175	P 34-310 ETPM ZMevolution or AbZ Z-30.11-61
		P 34-301 EN 10169+A1

Characteristics	Nominal thickness of the profile sheet [mm]		
	0,75	0,88	1,00
Weight [kg/m²]	9,80	11,50	13,10
Cross section A_p: [mm²/m]	1 183	1 400	1 600
Effective inertia I_{eff} [mm⁴/m]	175 800	222 300	254 100
Height of neutral axis [mm]	10,60	10,60	10,60
Modulus of inertia [mm³/m]	16 570	20 950	23 950

Nominal concrete consumption

	Thickness of the slab [cm]									
	9	10	11	12	13	14	15	16	17	18
Concrete volume [l/m²]	80	90	100	110	120	130	140	150	160	170
Theoretical weight of the composite slab [kg/m²]	200	225	250	275	300	325	350	375	400	425

Concrete density 2500 kg/m³

Maximum recommended slab thickness d = 20 cm

Cofrastra® 40 P:
Pre-punched version, compatible with shear connectors, welded in advance or in shop to the composite beams.

The Cofra® 5 web based software application

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

www.arcelormittal.com/cofra5

Fire resistance

	REI [min]			
	30	60	90	120
Thickness of the slab [cm]	9	9	11	13

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 EN1994-1-2 4.3.2, Cofrastra® 40 composite floors are by default REI 30.
For higher fire resistance classes, reinforcement bars are required. These are positioned in the ribs of the profile. Their size is determined by calculation (see Cofra5).

Sound insulation

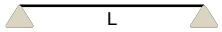
The acoustic behaviour of a raw composite slab is determined by its mass.
Given values are calculated by modelling – study report CSTB No. AC15-26054708

	Thickness of the slab [cm]									
	9	10	11	12	13	14	15	16	17	18
R_w [dB]	46	47	48	49	50	50	51	52	52	53
(C;Ctr) [dB]	(-1;-6)	(-2;-6)	(-2;-6)	(-2;-6)	(-1;-6)	(-1;-6)	(-1;-6)	(-2;-7)	(-1;-6)	(-2;-7)

Acoustic performance of the Cofrastra® 40 Décibel floor system			
Complex	**R_w(C;Ctr)**	**$L_{n,w}$**	**CSTB Report**
Cofrastra® Décibel: Cofrastra® 40 + slab thickness 140 mm + plénum space 70 mm + plasterboard BA13	56 (-6;-11) dB	66 dB	23268
Cofrastra® Décibel: Cofrastra® 40 + slab thickness 140 mm + plenum space 70 mm + IBR 60 mm + plasterboard BA13	65 (-4;-10) dB	61 dB	23268

Structural performance

Acceptable unweighted q values with g' = 0 in kg/m²
A calculation using Cofra 5 optimises these values 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
18	3000	3000	2839	2670	2518	2379	2252	2135	2028	1929	1837	1752	1672	1598	1529	1463	1402	1345	1290	1239	1191
17	3000	2863	2685	2524	2379	2246	2125	2014	1912	1817	1730	1649	1573	1502	1436	1375	1316	1262	1210	1161	1115
16	2890	2700	2531	2378	2239	2113	1998	1892	1795	1706	1623	1546	1474	1407	1344	1286	1231	1179	1130	1084	1040
15	2718	2538	2377	2231	2100	1980	1871	1771	1679	1594	1515	1442	1375	1311	1252	1197	1145	1096	1050	1006	965
14	2547	2376	2223	2085	1960	1847	1744	1649	1562	1482	1408	1339	1275	1216	1160	1108	1059	1013	969	929	890
13	2375	2214	2069	1939	1821	1714	1617	1528	1446	1371	1301	1236	1176	1120	1068	1019	973	930	889	851	815
12	2204	2051	1915	1792	1682	1581	1490	1406	1330	1259	1194	1133	1077	1025	976	930	887	847	809	773	-
11	2032	1889	1761	1646	1542	1448	1363	1285	1213	1147	1086	1030	978	929	884	841	801	-	-	-	-
10	2095	1727	1607	1500	1403	1315	1236	1163	1097	1036	979	927	878	833	-	-	-	-	-	-	-
9	1782	1778	1453	1353	1264	1183	1109	1042	980	924	-	-	-	-	-	-	-	-	-	-	-
	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
18	3000	3000	3000	3000	2872	2743	2623	2512	2409	2313	2224	2140	2062	1922	1789	1668	1556	1453	1359	1271	1190
17	3000	3000	2972	2830	2698	2576	2464	2360	2263	2173	2089	2010	1926	1790	1666	1553	1449	1353	1265	1183	1107
16	3000	2929	2781	2645	2524	2410	2304	2207	2117	2032	1954	1880	1784	1658	1543	1438	1341	1252	1170	1095	1024
15	2880	2727	2589	2462	2349	2243	2145	2054	1970	1892	1818	1750	1643	1527	1421	1323	1234	1152	1076	1006	942
14	2667	2526	2397	2281	2172	2077	1986	1902	1824	1751	1683	1619	1502	1395	1298	1209	1127	1052	982	918	859
13	2454	2324	2205	2098	1998	1910	1827	1749	1677	1610	1548	1467	1360	1263	1175	1094	1020	951	888	830	776
12	2240	2122	2015	1915	1825	1741	1667	1597	1531	1470	1413	1315	1219	1132	1052	979	912	851	794	741	693
11	2027	1920	1822	1734	1651	1574	1508	1444	1385	1329	1256	1162	1077	1000	929	864	805	750	700	653	-
10	1813	1717	1630	1551	1476	1409	1346	1291	1238	1183	1092	1010	936	868	806	750	698	-	-	-	-
9	1600	1515	1438	1368	1304	1243	1188	1136	1092	1006	929	858	795	-	-	-	-	-	-	-	-
	Without propping								**With 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