

cobiax

HOW TO COBIAX



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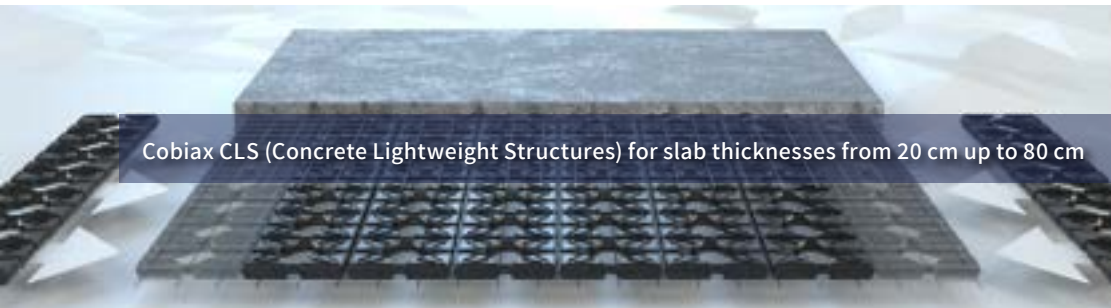
The Quick Guide
Cobiax CLS



Introduction

This Quick Guide is designed to give you a short introduction to the Cobiax technology. Additional information is available upon request or as a download from cobiax.com.

We strongly recommend the use of our CQL software tool. Our sales personnel will also be happy to answer your questions.



Technology and product features

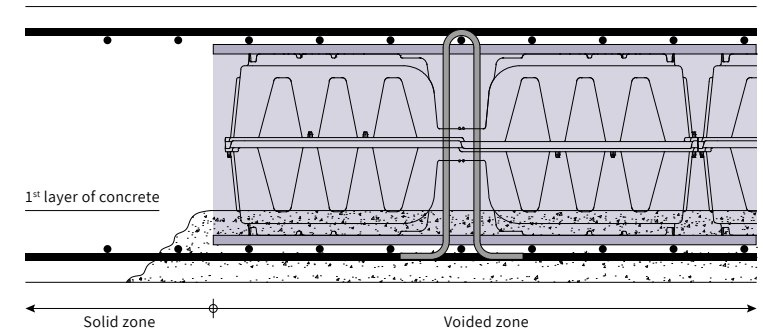
Cobiax technology uses recycled lightweight plastic void formers to replace the heavy concrete inside a slab where it is not required.

The resulting savings of up to 35% in concrete and weight has a positive effect on the construction of the slab itself (e.g. less deflection, larger spans or thinner slab thickness) and hence on the whole building structure.

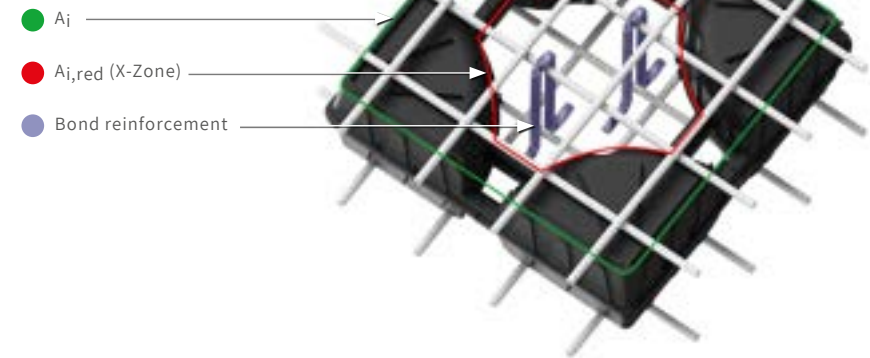
The internationally patented Cobiax CLS structural formers which are fully approved by the building authorities as well, feature a uniform base area of 60 x 60 cm and are made from 100% recycled plastic.

Cross section

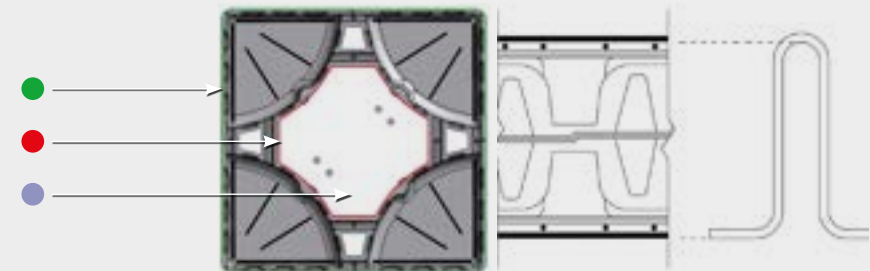
In-situ construction



When casting the concrete in two layers, the transmission of the horizontal shear forces in the joint between the concreting layers with reduced bonding area $A_{i,red}$ must be verified and a joint reinforcement arranged. The reinforcement shall be anchored on both sides of the contact surface. In any case, at least 4Ø8 must be provided in each X zone.



Example of bond reinforcement



Design and dimensioning

- Any commercially available FEM software is suitable for the calculation, no special software is required.
- Instructions for the calculation of the Cobiax slab are available for various FEM software on request.

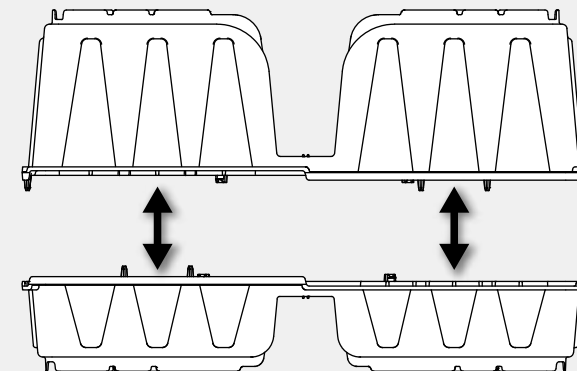
Resources

- Project based consulting
- Technology Manual „A Deep-Dive into Cobiax“
- Free online software CQL for determining the cross-section design and the input values for the structural analysis (all required Cobiax-specific verifications are provided).



What makes the Cobiax CLS so outstanding?

- Flawless installation guaranteed thanks to load-bearing X-zone in the product's center
- Always delivered in space-saving half-shell stacks
- Extremely fast one-click assembly
- Installation close to each other, therefore fast and uncomplicated
- Extremely stable and safe to walk on



Application data – Excerpt⁽¹⁾

| Installation element | | | CLS-P-110 | CLS-P-130 | CLS-P-150 | CLS-P-170 | CLS-P-190 | CLS-P-210 | CLS-P-230 | CLS-P-250 | CLS-P-270 | CLS-P-290 | CLS-P-310 | CLS-P-330 | CLS-P-350 | CLS-P-370 | CLS-P-390 | CLS-P-410 | CLS-P-470 | CLS-P-530 | CLS-P-590 | | | | |
|--------------------------------|--|-----------------|---------------------------------|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|--|--|
| 2 | Volume displacement | h_{cx} | m ³ /m ² | 0,0456 | 0,0569 | 0,0683 | 0,0794 | 0,0906 | 0,0992 | 0,1078 | 0,1167 | 0,1278 | 0,1364 | 0,1436 | 0,1547 | 0,1650 | 0,1639 | 0,1750 | 0,1919 | 0,2189 | 0,2392 | 0,2594 | | | |
| 3 | Associated weight reduction (25 kN/m ³) | g_{cx} | kN/m ² | 1,14 | 1,42 | 1,71 | 1,99 | 2,27 | 2,48 | 2,70 | 2,92 | 3,20 | 3,41 | 3,59 | 3,87 | 4,13 | 4,10 | 4,38 | 4,80 | 5,47 | 5,98 | 6,49 | | | |
| 4 | Support height | h_u | cm | 11,0 | 13,0 | 15,0 | 17,0 | 19,0 | 21,0 | 23,0 | 25,0 | 27,0 | 29,0 | 31,0 | 33,0 | 35,0 | 37,0 | 39,0 | 41,0 | 47,0 | 53,0 | 59,0 | | | |
| 5 | Min. slab thickness | $h_{d,min}$ | cm | 20 | 22 | 24 | 26 | 28 | 32 | 34 | 36 | 38 | 40 | 44 | 46 | 48 | 50 | 52 | 56 | 62 | 70 | 76 | | | |
| 6 | Max. slab thickness | $h_{d,max}$ | cm | 38 | 40 | 42 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 | 62 | 64 | 66 | 68 | 74 | 80 | 80 | | | |
| 7 | Min. thickness of concrete overlay to void (top/bottom) | $d_{z,Hk,min}$ | cm | 6 | | | | 7 | | | | 8 | | | | 9 | | 10 | | | | | | | |
| 8 | Distance void to upper edge of installation element | $h_{dis,o}$ | cm | | | | | | | | | | | | 1,5 | | | | | | | | | | |
| 9 | Distance void to lower edge of installation element | $h_{dis,u}$ | cm | | | | | | | | | | | | 1,5 | | | | | | | | | | |
| 10 | Limit slab thickness for $V_{Red,C,coibax}$ calculation | $h_{d,renz}$ | cm | | | | | | | | | | | | 76 | | | | | | | | | | |
| 11 | Shear factor (with $h_{d,min}$) | f_v | | 0,45 | 0,45 | 0,44 | 0,44 | 0,44 | 0,43 | 0,43 | 0,42 | 0,42 | 0,41 | 0,41 | 0,40 | 0,40 | | | | | | | | | |
| 12 | Stiffness factor (with $h_{d,min}$ and centric position) | f_{el} | | 0,96 | 0,94 | 0,93 | 0,91 | 0,89 | 0,90 | 0,88 | 0,87 | 0,86 | 0,85 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,83 | 0,81 | 0,80 | 0,79 | | | |
| 13 | Reduced bonding area | $A_{i,red}$ | | 0,21 Ai | | | | | | | | | | | | | | | | | | | | | |
| 14 | Concrete strength class | | | C20/25 to C45/55 | | | | | | | | | | | | | | | | | | | | | |
| 15 | Aggregate for max. grain size | | mm | 16 | | | | | | | | | | | | | | | | | | | | | |
| 16 | Concrete consistency class | | | F3 to F4 | | | | | | | | | | | | | | | | | | | | | |
| 17 | Max. diameter of reinforcing steel | | mm | 16 | | | | | | | | | | | | | | | | | | | | | |
| 18 | CO ₂ -emission reduction | | t/m ² | 0,010 | 0,012 | 0,014 | 0,017 | 0,019 | 0,021 | 0,023 | 0,025 | 0,027 | 0,029 | 0,030 | 0,032 | 0,035 | 0,034 | 0,037 | 0,040 | 0,046 | 0,050 | 0,054 | | | |
| 19 | Associated area per installation element | | m ² /St | 0,36 | | | | | | | | | | | | | | | | | | | | | |
| Component - Void former | | | | CLS-P-110 | CLS-P-130 | CLS-P-150 | CLS-P-170 | CLS-P-190 | CLS-P-210 | CLS-P-230 | CLS-P-250 | CLS-P-270 | CLS-P-290 | CLS-P-310 | CLS-P-330 | CLS-P-350 | CLS-P-370 | CLS-P-390 | CLS-P-410 | CLS-P-470 | CLS-P-530 | CLS-P-590 | | | |
| 21 | Top half-shell type | | | CLS-H-055 | CLS-H-075 | CLS-H-075 | CLS-H-095 | CLS-H-095 | CLS-H-115 | CLS-H-115 | CLS-H-175 | CLS-H-175 | CLS-H-175 | CLS-H-235 | CLS-H-235 | CLS-H-175 | CLS-H-295 | CLS-H-295 | CLS-H-235 | CLS-H-235 | CLS-H-295 | CLS-H-295 | | | |
| 22 | Bottom half-shell type | | | CLS-H-055 | CLS-H-055 | CLS-H-075 | CLS-H-075 | CLS-H-095 | CLS-H-095 | CLS-H-115 | CLS-H-075 | CLS-H-095 | CLS-H-115 | CLS-H-075 | CLS-H-095 | CLS-H-175 | CLS-H-075 | CLS-H-095 | CLS-H-175 | CLS-H-235 | CLS-H-235 | CLS-H-295 | | | |
| 23 | Void height | h_v | cm | 8,0 | 10,0 | 12,0 | 14,0 | 16,0 | 18,0 | 20,0 | 22,0 | 24,0 | 26,0 | 28,0 | 30,0 | 32,0 | 34,0 | 36,0 | 38,0 | 44,0 | 50,0 | 56,0 | | | |
| 24 | Diameter / outer dimensions | | cm | 60,0/60,0 | | | | | | | | | | | | | | | | | | | | | |
| 25 | Void volume | | dm ³ /St | 16,4 | 20,5 | 24,6 | 28,6 | 32,6 | 35,7 | 38,8 | 42,0 | 46,0 | 49,1 | 51,7 | 55,7 | 59,4 | 59,0 | 63,0 | 69,1 | 78,8 | 86,1 | 93,4 | | | |
| 26 | Min. center distance of void formers | e | cm | 60 | | | | | | | | | | | | | | | | | | | | | |
| 27 | Min. web width | a | cm | 6,0 | | | | | | | | | | | | | | | | | | | | | |
| 28 | Void formers per square meter | | St/m ² | 2,78 | | | | | | | | | | | | | | | | | | | | | |
| 29 | Associated area per void former | | m ² /St | 0,36 | | | | | | | | | | | | | | | | | | | | | |
| 30 | Void formers per installation element | | St/St | 1 | | | | | | | | | | | | | | | | | | | | | |
| Bond reinforcement | | | | CLS-P-110 | CLS-P-130 | CLS-P-150 | CLS-P-170 | CLS-P-190 | CLS-P-210 | CLS-P-230 | CLS-P-250 | CLS-P-270 | CLS-P-290 | CLS-P-310 | CLS-P-330 | CLS-P-350 | CLS-P-370 | CLS-P-390 | CLS-P-410 | CLS-P-470 | CLS-P-530 | CLS-P-590 | | | |
| 40 | Weight per square meter | | kg/m ² | 1,45 | 1,54 | 1,62 | 1,71 | 1,80 | 1,89 | 1,98 | 2,06 | 2,15 | 2,24 | 2,33 | 2,41 | 2,50 | 2,59 | 2,68 | 2,77 | 3,03 | 3,29 | 3,56 | | | |
| 41 | Cross-section of transversal bars | $a_{s,verh,cx}$ | cm ² /m ² | 5,59 | | | | | | | | | | | | | | | | | | | | | |