

## ECLA EUROPEAN CLASSIFICATION

- E04C STRUCTURAL ELEMENTS; BUILDING MATERIALS** (for bridges [E01D](#); specially designed for insulation or other protection [E04B](#); elements used as building aids [E04G](#); for mining [E21](#); for tunnels [E21D](#); structural elements with broader range of application than for building engineering [F16](#), particularly [F16S](#))
- E04C1/00 Building elements of block or other shape for the construction of parts of buildings** (of relatively thin form [E04C2/00](#); structural elongated elements designed for load-supporting [E04C3/00](#), e.g. columns or pillars [E04C3/30](#); manufacture or material of building bricks, stones, or the like [B28](#), [C03](#), [C04](#); paving elements [E01C](#); general building constructions [E04B](#), e.g. walls [E04B2/00](#), floors [E04B5/00](#), roofs [E04B7/00](#), ceilings [E04B9/00](#); [N: roof coverings [E04D](#); coverings for walls or ceilings [E04F13/00](#); floorings [E04F15/00](#)] structural elements specially designed for built-in conduit shafts [E04F17/00](#); [N: elements for buildings for particular purposes [E04H7/00](#)]; special elements for building ovens or furnaces [F24B](#), [F27D](#))
- [E04C1/24](#) . [N: [IPC4](#)] Elements for building-up floors, ceilings, roofs, arches, or beams ([E04C1/39](#) to [E04C1/42](#) take precedence; flooring [E04F15/00](#))
- [E04C1/34](#) . . [N: [IPC4](#)] designed for use as filling elements
- [E04C1/36](#) . . . [N: [IPC4](#)] between joists or girders
- [E04C1/38](#) . . . [N: [IPC4](#)] in ribbed or cross-ribbed floors, ceilings, or roofs consisting of reinforced concrete
- [E04C1/39](#) . characterised by special adaptations, e.g. serving for locating conduits, for forming soffits, cornices, or shelves, for fixing wall-plates or door-frames, for claustra
- [E04C1/39A](#) . . [N: for ventilating, heating or cooling] [[C9610](#)]
- [E04C1/39B](#) . . [N: for claustra, fences, planting walls, e.g. sound-absorbing (pots for vertical horticulture [A01G9/02C](#))]
- [E04C1/39C](#) . . [N: serving for locating conduits ([E04C1/39A](#) takes precedence)] [[N9610](#)]
- [E04C1/40](#) . built-up from parts of different materials, e.g. composed of layers of different materials or stones with filling material or with insulating inserts
- [E04C1/41](#) . . composed of insulating material and load-bearing concrete, stone or stone-like material [[N9501](#)]
- [E04C1/42](#) . of glass or other transparent material [N: (panels made of glass bricks [E04C2/54C](#))] [[C9607](#)]
- E04C2/00 Building elements of relatively thin form for the construction of parts of buildings, e.g. sheet materials, slabs, or panels** (materials or manufacture, see the relevant subclasses, e.g. [B27N](#), [D21J](#); made in situ [E04B](#); specially designed for insulation or other protection [E04B1/62](#); load-carrying floor structures [E04B5/02](#), [E04B5/16](#); roofs consisting of self-supporting slabs [E04B7/20](#); roof or like covering elements [E04D3/00](#); for lining or finishing [E04F13/00](#))
- [E04C2/02](#) . characterised by specified materials (translucent [E04C2/54](#))
- [E04C2/04](#) . . of concrete or other stone-like material; of asbestos cement; [N: of cement and other mineral fibres] ([E04C2/26](#) takes precedence; material or manufacture [B28](#), [C04](#)) [[C9604](#)]

- E04C2/04B . . . [N: composed of a number of smaller elements, e.g. bricks, also combined with a slab of hardenable material]
- E04C2/04B1 . . . . [N: Apparatus for handling the smaller elements or the hardenable material; bricklaying machines for prefabricated panels (bricklaying machines in general [E04G21/22](#))]
- E04C2/04C . . . [N: of plaster ([E04C2/04F](#) takes precedence)]
- E04C2/04D . . . [N: of concrete ([E04C2/04F](#) takes precedence)]
- E04C2/04F . . . [N: completely or partially of insulating material, e.g. cellular concrete or foamed plaster]
- E04C2/06 . . . reinforced
- E04C2/08 . . of metal, e.g. sheet metal ([E04C2/26](#) takes precedence)
- E04C2/10 . . of wood, fibres, chips, vegetable stems, or the like; of plastics; of foamed products ([N: [E04C2/04F](#), [E04C2/26](#) take precedence; [N: hydraulic cement and mineral fibres [E04C2/04](#)])
- E04C2/12 . . . of solid wood
- E04C2/14 . . . . reinforced
- E04C2/16 . . . of fibres, chips, vegetable stems, or the like
- E04C2/18 . . . . with binding wires, reinforcing bars, or the like
- E04C2/20 . . . of plastics
- E04C2/20B . . . . [N: of foamed plastics, or of plastics and foamed plastics, optionally reinforced]
- E04C2/22 . . . . reinforced [N: [E04C2/20B](#) takes precedence]
- E04C2/24 . . . laminated and composed of materials covered by two or more of groups [E04C2/12](#), [E04C2/16](#), [E04C2/20](#)
- E04C2/24B . . . . [N: one at least of the material being insulating]
- E04C2/24C . . . . [N: combinations of materials fully covered by [E04C2/16](#) and [E04C2/20](#)]
- E04C2/26 . . composed of materials covered by two or more of groups [E04C2/04](#), [E04C2/08](#), [E04C2/10](#) or of materials covered by one of these groups with a material not specified in one of the groups [N: (of cement and mineral fibres [E04C2/04](#))]
- E04C2/28 . . . combinations of materials fully covered by groups [E04C2/04](#) and [E04C2/08](#) [[C9501](#)]
- E04C2/284 . . . at least one of the materials being insulating [[N9501](#)]
- E04C2/288 . . . . composed of insulating material and concrete, stone or stone-like material [[N9501](#)]
- E04C2/288B . . . . . [N: with the insulating material being completely surrounded by, or embedded in, a stone-like material, e.g. the insulating material being discontinuous] [[N9501](#)]
- E04C2/292 . . . . composed of insulating material and sheet metal [[N9501](#)]
- E04C2/296 . . . . composed of insulating material and non-metallic or unspecified sheet-material ([E04C2/288](#) takes precedence) [[N9501](#)]
- E04C2/30 . . characterised by the shape or structure ([translucent](#) [E04C2/54](#))
- E04C2/32 . . formed of corrugated or otherwise indented sheet-like material; composed of such layers with or without layers of flat sheet-like material
- E04C2/32A . . . [N: with parallel corrugations]
- E04C2/32B . . . [N: with incisions or reliefs in the surface ([E04C2/32C](#) takes precedence)]
- E04C2/32C . . . [N: with corrugations, incisions or reliefs in more than one direction of the element]

- E04C2/32D . . . [N: slightly bowed or folded panels not otherwise provided for]
- E04C2/34 . . . composed of two or more spaced sheet-like parts ([E04C2/32](#) takes precedence; spacers for cavity walls [E04B2/44](#))
- E04C2/34B . . . [N: spaced apart by profiled spacer sheets] [[C0304](#)]
- E04C2/36 . . . spaced apart by transversely-placed strip material, e.g. honeycomb panels (honeycomb or other core members for layered products [B32B](#))
- E04C2/36B . . . . [N: by honeycomb structures]
- E04C2/38 . . . with attached ribs, flanges, or the like, e.g. framed panels (concerned with attaching to other panels or elements to form a structure, see the places for the relevant structure, e.g. [E04B2/00](#))
- E04C2/38B . . . . [N: with a frame of concrete or other stone-like substance]
- E04C2/38C . . . . [N: with a metal frame]
- E04C2/38D . . . . [N: with a frame of unreconstituted or laminated wood]
- E04C2/38E . . . . [N: with a frame of other materials, e.g. fibres, plastics]
- E04C2/40 . . . composed of a number of smaller components rigidly or movably connected together, e.g. interlocking, hingedly connected [N: of particular shape, e.g. not rectangular of variable shape or size, e.g. flexible or telescopic panels ([E04C2/04B](#) takes precedence)]
- E04C2/40B . . . . [N: composed of two or more hingedly connected parts]
- E04C2/42 . . . Gratings; Grid-like panels (reinforcing elements [E04C5/00](#); built-in gratings [E04F19/10](#); gratings in general [F16S3/00](#))
- E04C2/42A . . . . [N: made of bar-like elements, e.g. bars discontinuous in one direction] [[N9603](#)]
- E04C2/42A1 . . . . . [N: with continuous bars connecting at crossing points of the grid pattern] [[N9603](#)]
- E04C2/42A1A . . . . . . [N: with notches] [[N9603](#)]
- E04C2/42A1B . . . . . . [N: made of perforated bars] [[N9603](#)]
- E04C2/42A2 . . . . . [N: with continuous bars that remain unconnected at crossing points of the grid pattern, e.g. with undulating bars] [[N9603](#)]
- E04C2/42B . . . . [N: Expanded metal or other monolithic gratings] [[N9603](#)]
- E04C2/42C . . . . [N: Separate connecting means, e.g. connecting gratings to underlying structure] [[N9603](#)]
- E04C2/44 . . . [N: [IPC4](#)] characterised by the purpose
- E04C2/46 . . . [N: [IPC4](#)] specially adapted for making walls ([E04C2/52](#), [E04C2/54](#) take precedence; structure of slab-shaped elements [E04B1/02](#); walls of elements of relatively thin form [E04B2/72](#))
- E04C2/48 . . . [N: [IPC4](#)] as high as or higher than the room, i.e. having provisions concerning the connection with at least two floors ([E04C2/52](#) and [E04C2/54](#) take precedence)
- E04C2/50 . . . [N: [IPC4](#)] Self-supporting slabs specially adapted for making floors ceilings, or roofs, e.g. able to be loaded ([E04C2/52](#), [E04C2/54](#) take precedence; structures of slab-shaped elements [E04B1/02](#); floor structures [E04B5/00](#); [N: roofs consisting of self-supporting slabs [E04B7/20](#)]; ceilings [E04B9/00](#); roof coverings [E04D](#); floor coverings [E04F15/00](#))
- E04C2/52 . . . with special adaptations for auxiliary purposes, e.g. serving for locating conduits ([E04C2/54](#) takes precedence; block-shaped elements therefor [E04C1/39](#); floor structures incorporating ducts [E04B5/48](#))
- E04C2/52A . . . . [N: serving for locating conduits; for ventilating, heating or cooling]
- E04C2/52A2 . . . . . [N: for ventilating]

- E04C2/52A3 . . . . [N: for heating or cooling (solar heat collectors [F24J2/04](#); heat storage [F28D20/00](#))]
- E04C2/52C . . . . [N: with adaptations not otherwise provided for, for connecting, transport; for making impervious or hermetic, e.g. sealings]
- E04C2/52C2 . . . . [N: Impervious or hermetic panels not otherwise provided for]
- E04C2/54 . . . . Slab-like translucent elements (floors for transmitting light [E04B5/46](#); translucent or open-work ceilings [E04B9/32](#), [E04B9/34](#); translucent roof coverings [E04D3/06](#), [E04D3/28](#))
- E04C2/54B . . . . [N: Hollow multi-walled panels with integrated webs] [N9604]
- E04C2/54C . . . . [N: made of glass bricks] [N9607]
  
- E04C3/00**                    **Structural elongated elements designed for load-supporting (as building aids [E04G](#))**
  
- E04C3/00B . . . . [N: Girders or columns that are rollable, collapsible or otherwise adjustable in length or height (girders as supporting members for forms [E04G11/54](#))]
  
- E04C3/02 . . . . Joists; Girders, trusses, or trusslike structures, e.g. prefabricated; Lintels; Transoms; [N: Braces] ([E04C3/38](#) takes precedence; for structures characterised by movable, separable, or collapsible parts [E04B1/343](#); [N: braced purlins [E04B7/02A2](#)]) [C0210]
- E04C3/04 . . . . of metal ([E04C3/29](#) takes precedence; as reinforcing elements [E04C5/06](#); manufacture [B21](#))
- E04C3/06 . . . . with substantially solid, i.e. unapertured, web ([E04C3/10](#), [E04C3/11](#) take precedence) [N: honeycomb girders [E04C3/08B](#)]
- E04C3/06H . . . . . [N: with special adaptations for the passage of cables or conduits through the web] [N1204]
- E04C3/07 . . . . . at least partly of bent or otherwise deformed strip- or sheet-like material
- E04C3/08 . . . . with apertured web, e.g. with a web consisting of bar-like components; Honeycomb girders ([E04C3/10](#), [E04C3/11](#) take precedence)
- E04C3/08B . . . . . [N: Honeycomb girders; Girders with apertured solid web]
- E04C3/08B1 . . . . . [N: of the castellated type] [N1204]
- E04C3/09 . . . . . at least partly of bent or otherwise deformed strip- or sheet-like material
- E04C3/10 . . . . prestressed
- E04C3/11 . . . . with non-parallel upper and lower edges, e.g. roof trusses (arched girders, portal frames [E04C3/38](#))
- E04C3/12 . . . . of wood, e.g. with reinforcements, with tensioning members ([E04C3/292](#) takes precedence)
- E04C3/12A . . . . [N: Laminated ] [N1204]
- E04C3/12B . . . . [N: End caps therefor] [N1204]
- E04C3/12C . . . . [N: with hollow cross section] [N1204]
- E04C3/14 . . . . with substantially solid, i.e. unapertured, web ([N: [E04C3/12C](#),] [E04C3/17](#), [E04C3/18](#) take precedence) [C1206]
- E04C3/14B . . . . . [N: with special adaptations for the passage of cables or conduits through the web, e.g. reinforcements] [N1204]
- E04C3/16 . . . . with apertured web, e.g. trusses ([E04C3/17](#), [E04C3/18](#) take precedence)
- E04C3/17 . . . . with non-parallel upper and lower edges, e.g. roof trusses
- E04C3/18 . . . . with metal [N: or other] reinforcements or tensioning members [C0108]
- E04C3/18B . . . . . [N: Synthetic reinforcements] [N0108]

- E04C3/20 . . . of concrete or other stone-like material, e.g. with reinforcements or tensioning members ([reinforcing elements E04C5/00](#))
- E04C3/20B . . . . [N: with apertured web, e.g. frameworks, trusses ([E04C3/26 takes precedence](#))]
- E04C3/22 . . . . built-up by elements jointed in line
- E04C3/26 . . . . prestressed ([E04C3/22](#), [E04C3/29 take precedence](#); Prestressing members [E04C5/08](#))
- E04C3/28 . . . of other materials not covered by groups [E04C3/40](#) - [E04C3/44](#)
- E04C3/28A . . . . [N: of glass] [[N1204](#)]
- E04C3/29 . . . built-up from parts of different material, [N: i.e. composite structures]
- E04C3/29A . . . . [N: with apertured web] [[N1204](#)]
- E04C3/292 . . . . the materials being wood and metal
- E04C3/293 . . . . the materials being steel and concrete ([concrete with internal reinforcements or tensioning members E04C3/20](#))
- E04C3/294 . . . . . of concrete combined with a girder-like structure extending laterally outside the element ([light weight girders used as reinforcement E04C5/065](#); as part of a floor structure [E04B5/23](#))
  
- E04C3/30 . . . Columns; Pillars; Struts ([not designed for end loading E04C3/02](#); posts, masts, as independent structures [E04H12/00](#))
- E04C3/32 . . . of metal ([E04C3/36 takes precedence](#))
- E04C3/34 . . . of concrete other stone-like material, with or without permanent form elements, with or without internal or external reinforcement, e.g. metal coverings ([E04C3/36 takes precedence](#))
- E04C3/36 . . . of other materials not covered by groups [E04C3/40](#) - [E04C3/44](#); of a combination of two or more materials [[M1207](#)]
  
- E04C3/38 . . . Arched girders or portal frames ([straight girders able to be bent E04C3/02](#); inflatable [E04H15/20](#))
- E04C3/40 . . . of metal ([E04C3/46 takes precedence](#))
- E04C3/42 . . . of wood, e.g. units for rafter roofs ([E04C3/46 takes precedence](#))
- E04C3/44 . . . of concrete or other stone-like material, e.g. with reinforcements or tensioning members ([E04C3/46 takes precedence](#))
- E04C3/46 . . . of other materials not covered by groups [E04C3/40](#) - [E04C3/44](#); of a combination of two or more materials [[M1207](#)]

**E04C5/00** **Reinforcing elements, e.g. for concrete; Auxiliary elements therefor** ([N: methods or devices for making reinforcing materials [B21D](#)]; material composition [N: [C04B](#)], [C21](#), [C22](#); arrangements of reinforcing elements, see the relevant subclasses) [[C9410](#)]

[N: **Notes**

1. In this group, the following terms or expressions are used with the meanings indicated:

- "reinforcing" means increasing any physical strength characteristic of the end product, e.g. compressive or flexural strength;
- "elements" includes relatively large bodies, e.g. steel bars, as well as relatively small discrete bodies of any form, e.g. glass fibres.

2. Discrete reinforcing elements, which are small compared with the reinforced building element, only characterised by their composition are classified in [C04B](#), e.g. steel fibres [C04B14/48](#), plastic elements with a shape other than granular or fibrous [C04B16/12](#)

]

- E04C5/01 . Reinforcing elements of metal, e.g. with non-structural coatings [N: ([E04C5/08](#) takes precedence)]
- E04C5/01A . . [N: Discrete reinforcing elements, e.g. fibres] [N9410]
- E04C5/01B . . [N: Anti-corrosion coatings or treating compositions, e.g. containing waterglass or based on another metal (coating of discrete reinforcing elements [C04B20/10](#))] [C9410]
- E04C5/01B1 . . . [N: Anti-corrosion coatings or treating compositions containing cement]
- E04C5/02 . . of low bending resistance [C9410]
- E04C5/03 . . . with indentations, projections, ribs, or the like, for augmenting the adherence to the concrete
- E04C5/04 . . . Mats [N: combined with reinforcing elements protruding out of the plane of the mat [5/06B](#); three-dimensional mats [E04C5/06C](#); bases for plaster [E04F13/04](#)] [C9610]
- E04C5/06 . . of high bending resistance, i.e. of essentially three-dimensional extent, e.g. lattice girders [N: (anchorage devices specially adapted for balconies [E04B1/00D2](#); supporting devices for connector reinforcing rods for concrete walls [E04G21/12D](#))] [C9610]
- E04C5/06A . . . [N: Prismatic or cylindrical reinforcement cages composed of longitudinal bars and open or closed stirrup rods ([E04C5/06B1](#) takes precedence)] [N9610]
- E04C5/06A1 . . . . [N: Closed cages composed of two or more coating cage parts, e.g. transversally hinged or nested parts] [N9610]
- E04C5/06A2 . . . . [N: Closed cages made of one single bent reinforcement mat] [N9610]
- E04C5/06A3 . . . . [N: Closed cages with spiral- or coil-shaped stirrup rod] [N9610]
- E04C5/06A4 . . . . [N: Open cages, e.g. connecting stirrup baskets ([E04C5/06A1](#) takes precedence)] [N9610]
- E04C5/06B . . . [N: Three-dimensional reinforcements composed of a prefabricated reinforcing mat combined with reinforcing elements protruding out of the plane of the mat ([E04C5/06D](#) takes precedence)] [N9610]
- E04C5/06B1 . . . . [N: Reinforcing mats combined with separate prefabricated reinforcement cages or girders ([E04C5/06C1](#) takes precedence)] [N9610]
- E04C5/06C . . . [N: Three-dimensional reinforcing mats composed of reinforcing elements laying in two or more parallel planes and connected by separate reinforcing parts ([E04C5/06D](#) takes precedence)] [N9610]
- E04C5/06C1 . . . . [N: the reinforcing elements in each plane being formed by, or forming a, mat of longitudinal and transverse bars] [N9610]
- E04C5/06D . . . [N: Shear reinforcements, e.g. shearheads for floor slabs] [N9610]
- E04C5/065 . . . Light-weight girders, e.g. with precast parts (light-weight girders in general [E04C3/08](#), [E04C3/294](#))
- E04C5/065A . . . . [N: with precast parts] [N1204]
- E04C5/065A1 . . . . . [N: with lost formwork] [N1204]

- E04C5/07 . Reinforcing elements of material other than metal, e.g. of glass, of plastics, or not exclusively made of metal ([metal elements with non-structural coatings E04C5/01](#))
- E04C5/07A . . [N: Discrete reinforcing elements, e.g. fibres] [N9410]
- E04C5/07A1 . . . [N: Specially adapted packagings therefor, e.g. for dosing] [N1204]
- E04C5/08 . Members specially adapted to be used in prestressed constructions [N: (production of reinforced objects in general [B28B23/00](#); prestressed structures produced in situ [E04G21/12](#))] [C9410]
- E04C5/08A . . [N: Tensile members made of fiber reinforced plastics] [N1204]
- E04C5/10 . . Ducts
- E04C5/12 . . Anchoring devices ([tools or methods for tensioning \[N: in situ E04G21/12\]](#)) [C9410]
- E04C5/12B . . . [N: the tensile members are anchored by wedge-action]
- E04C5/12C . . . [N: the tensile members are profiled to ensure the anchorage, e.g. when provided with screw-thread, bulges, corrugations]
- E04C5/12D . . . [N: The tensile members being made of fiber reinforced plastics] [N1204]
- E04C5/16 . Auxiliary parts for reinforcements, e.g. connectors, spacers, stirrups ( [N: [E04C5/06](#) takes precedence;] [tools connecting reinforcing elements E04G21/12](#)) [C1206]
- E04C5/16A . . [N: Protective caps for the ends of reinforcing bars] [N1204]
- E04C5/16B . . [N: Connectors or means for connecting parts for reinforcements ([E04C5/16C](#) takes precedence)] [N9501]
- E04C5/16B1 . . . [N: the reinforcements running in one single direction] [N9501]
- E04C5/16B1A . . . . [N: Coaxial connection by means of sleeves] [N9501]
- E04C5/16B2 . . . [N: the reinforcements running in different directions] [N9501]
- E04C5/16B2A . . . . [N: Connection by means of clips or other resilient elements] [N9501]
- E04C5/16C . . [N: Spacers connecting parts for reinforcements and spacing the reinforcements from the form] [N9501]
- E04C5/18 . . [N: Spacers] of metal or substantially of metal [N: ([E04C5/16C](#) takes precedence)] [C1206]
- E04C5/20 . . of material other than metal or with only additional metal parts, e.g. concrete or plastics spacers with metal binding wires [N: ([E04C5/16C](#) takes precedence)] [C9501]
- E04C5/20A . . . [N: Spacer blocks with embedded separate holding wire or clips] [N1204]
- E04C5/20B . . . [N: Circular and spherical spacers] [N1204]
- E04C5/20C . . . [N: Ladder or strip spacers] [N1204]
- E04C5/20D . . . [N: Spacers having means to adapt the spacing distance] [N1204]
- E04C5/20E . . . [N: Spacers especially adapted for cylindrical reinforcing cages] [N1204]