

## General

### Version 18.0

Build	Module	Description	ID
29.11.18	Design	Recesses whose distance was entered with reference to the center were displayed correctly, but wrongfully calculated with the distance to the bottom edge of the recess.	13139
19.10.18	User interface	The corresponding table is now activated when clicking onto an entry in the object tree.	13059
31.07.18	Design	For different reinforcing steel qualities in the shear joint and shear design, the proportions of the existing web stirrup were calculated from the shear force design and additions for the shear joint design. For the unlikely case that there is no slab in the shear joint, the shear joint additions are being calculated as stirrups with a different steel quality. From this, a wrong utilization of the design was calculated as quotient of the varying steel strengths.	12660
25.04.18	General	Texts for the task and the position were cut-off after 21 characters.	9755
25.04.18	General	An existing position name is now suggested as file name when using "Save as".	11990
25.04.18	Output document	Line loads, which are actually next to each other, were drawn above each other in the graphic of the load cases.	9930
25.04.18	User interface	The current objects of the clipboard are now listed in the context menu functions, which serve the clipboard functions "cut / copy / paste".	11663
25.04.18	User interface	Recesses were missing in the 3D view.	11923
25.04.18	User interface	Modifications in the color settings can now also be saved as default.	11981
25.04.18	User interface	The project file and the corresponding *.res folder can be archived as *.zip file via the new function "Archive project" in the ribbon menu (Area A).	11996
25.04.18	User interface	The pre-installed examples can now be opened directly via the new function "Open examples" in the ribbon menu (Area A).	11999
25.04.18	User interface	The display of some components in the graphical user-interface has been adjusted, in order to consider the specified scaling in the display settings of the operating system.	12364
25.04.18	Input	The z-position of a recess can now alternatively be specified as distance between the BE girder and the center of the recess.	11254
25.04.18	Output document	The texts were not visible in the graphic of the load cases for line loads with very little values and thus a resulting thin drawing.	9724
25.04.18	Output document	Multiple single loads at the same x-position were drawn on top of each other, so that it was not possible to distinguish them in the graphic of the load cases.	11163
25.04.18	User interface	There was always only one layer of the strands visible in the view.	9666
25.04.18	User interface	Was "no design" selected, then the analysis overview still appeared at the end of the calculation although the window was empty.	9754
25.04.18	User interface	Not only the content of the cell, but also the corresponding objects were deleted when deleting a selected cell.	11979

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Build	Module	Description	ID
17.01.18	Calculation	Was only a torsional bedding existent as bedding, then the system graph in the output list was faulty which caused RTreport to issue an error message.	11901
17.01.18	Calculation	A single load at the right girder end has been ignored for a span-by-span distribution of the loading.	12168
10.04.17	Output document	The readability of the indices in the dimension lines of the cross-section has been improved. Additionally, the indices in the system graph have been enlarged. (An installation of the updated base package is required for this.)	11258
08.03.17	Design	Accidental loads were sometimes considered multiple times depending on the involved live load categories in the stress resultants of the accidental combination.	11084
21.02.17	General	There were modifications made in the base package (e.g. in RTreport), which influence this program. For this, please read the release notes of RTbase.	10949
21.02.17	User interface	The maximum dimensions of the cross-sections as well as the static cross-section values are displayed in the property window for all types of materials.	10243
21.02.17	User interface	The unit for $\phi_y$ and $\phi_z$ was missing in the table for moment joints.	10748
21.02.17	Load transfer	The behavior when copying n single loads with the spacing dx in the table "Loading" and in the transfer of loads n-times with the spacing dx during the load transfer has been unified.	10239
21.02.17	User interface	Only a trilateral or quadrilateral flame application is possible as fire loading from now on.	10174
21.02.17	User interface	An eccentricity does not make sense for single moments, which is why the associated field for the input has been deactivated. Line moments in x-direction are now also possible.	10236
21.02.17	User interface	Now, a coordinate system is also displayed in the system graph. It already existed in the 3D view, however, it was placed incorrect.	10880
21.02.17	Input	The selection of a tendon can now also be made in the table "Prestressing".	9665

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Build	Module	Description	ID
06.03.17	Design	Accidental loads were sometimes considered multiple times depending on the involved live load categories in the stress resultants of the accidental combination.	11044
13.12.16	General	On computers with high-resolution screens (4K resolution) and preset scaling of the fonts the program could not be started.	10580
13.12.16	Load transfer	Since the beginning of August 2016, the sign of the moments and horizontal forces for system angles of 90 and 270 degree was transformed incorrectly for the load transfer between BALKEN and BALKEN, respectively, BALKEN and BEST.	10677
18.08.16	Load transfer	Now, optionally the incoming loads can also be interpreted as line loads. This has the effect, that the load value is not blurred over the distribution width, but is applied as load in kN/m over the specified width. This behavior is triggered in the load transfer dialog by activating the transfer as line load with the desired distribution width and also ticking "Source as line load".	9956
18.08.16	Calculation	Now, the differing combination coefficients of the attribute "Snow above 1000m" is being considered when generating combinations.	9960
18.08.16	Analyses	<b>Fire protection</b> The total utilization of continuous slabs results from the ratio of the slab widths and the reinforcement center distances.	10091
10.06.16	User interface	The characteristic deformations are included in the result list as table.	9839
10.06.16	Load transfer	The name of the *.lrf file is now used as load name in the transfer.	9830
10.06.16	General	When closing the project it is being checked, whether the data differs from the last saved condition. The user is requested to save the file only if changes have been made.	9824
10.06.16	Load transfer	The offset ey from the load transfer was applied into the wrong direction.	9802
10.06.16	Load transfer	The specification of the factors was not considered when transferring loads as line load.	9832
10.06.16	Load transfer	Were loads transferred as line loads, then these were transferred once again with each editing of this transfer.	9833
08.04.16	Design	<b>Tabular fire protection</b> An incorrect web height was calculated for inclined I-beams in the area of the recess. Furthermore, the minimum axis distance of the reinforcement is compared to the existing mean axis distance "am" of the tension reinforcement, i.e. $am = 1$ for non-prestressed structural members.	9765
08.04.16	User interface	Support forces were only transferred as single loads and not as line loads in the load transfer.	9722
31.03.16	General	The program terminated after a program update with a server installation.	9753
14.03.16	General	Projects are no longer automatically saved before each calculation. Is this desired, then the option "Save project before calculation" has to be ticked via "Settings -> Options -> Program settings".	9600
14.03.16	General	Temperature loads were only issued in the loading journal if outer loads existed.	9633
14.03.16	User interface	The column for the name affix ( <i>Name</i> ) in the table <i>Load cases</i> was missing for beams with the material selection "Structural steel" or "Timber".	9690
14.03.16	Calculation	The spring stiffness of elastic supports is transferred to the calculation in the correct unit.	9706
27.01.16	General	As another program of the RIBtec product group, BALKEN received a <b>new graphical user interface</b> . The hereby accompanying <b>new handling concept</b> offers a well-arranged input and displays almost all selected settings at a glance. This is achieved by modern handling elements such as the ribbon bar, a property grid for the input and display of structural member properties as well as by an interactive graphic display (plan view and views as well as 3D overview).	9556

Build	Module	Description	ID
27.01.16	General	It can be specified via <i>Settings</i>   <i>Options</i> , which directories are to be used to open and save the projects plus which elements are to be displayed with which attributes (e.g. color, line width, scale). This allows an individual adjustment of the program settings and the graphical user interface.	9557
27.01.16	General	Files with different defaults can now be managed as <b>templates</b> . Thus, templates for various applications, which enable a quick and problem specific use of the program, can be generated and saved.	9558
27.01.16	General	It is now possible to output the printout in a different language than the one selected for the graphical user interface. Therefore it is possible for instance, to work with a German user interface and generate a printout in English.	9559
27.01.16	General	Different materials are now available for the calculation and design: <ul style="list-style-type: none"> <li>• Reinforced concrete / prestressed concrete</li> <li>• Structural steel</li> <li>• Timber</li> </ul>	9565
27.01.16	General	The new option <b>elastically bedded beam</b> provides the following options: <ul style="list-style-type: none"> <li>• elastic bedding according to the subgrade reaction method without tensile failure</li> <li>• consideration of a lowering, longitudinal and a torsional bedding</li> <li>• arbitrary bedding segments</li> <li>• conversion of constrained modulus into subgrade reaction coefficients</li> <li>• calculation of the base pressure forces</li> <li>• the appropriate options for concrete, structural steel or timber are necessary for the analyses</li> </ul>	9569
27.01.16	Output document	The output of the result list is made with RTreport from now on. The hitherto existing output via RTconfig or RTprint is no longer possible. Several filter and control options are available in RTreport, in order to organize the list output as individual as possible. The output can be made via several predefined lists, whereby the result display can be adjusted individually for each type of list. The individually specified result lists can be saved as style sheet.	9562

## Reinforced concrete

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Build	Module	Description	ID
29.11.18	Output document	In the section "Bending design - Bearing capacity" the unnecessary information of a utilization is omitted.	13056
29.11.18	Output document	A utilization > 1,0 in the design for shear force and torsion according to CSN EN eq. 6.29 was not issued in the result list.	13058
29.11.18	Design	The admissible compressive stress in a node of the strut and tie model (notch) has been adjusted to the national coefficients. The coefficients according to DIN EN hereby remain unchanged.	13082
19.10.18	Output document	The cross-section height in the area of the notch is issued correctly again in the result protocol of the bending reinforcement.	12770
19.10.18	Design	The utilization of the shear reinforcement was determined too high with an existing shear joint.	12746
19.10.18	Design	The determination, respectively, consideration of the effective increase in stiffness from the shrinkage proportion in the deflection calculation according to Krüger-Mertzsch has been removed again. Thus, the determined deflection in the cracked state correspond with the results in Version 17.0 again.	12816
19.10.18	Design	The equation 6.31 of the DIN EN 1992 is being considered for the torsion design again.	12871
19.10.18	Design	On special request, a factor for the shear force in the compression chord smaller than in the tension chord can be specified for the recess design.	12885
19.10.18	Calculation	In the design of the accidental situation sometimes too high partial safety factors for the material were used in the calculation for notches and recesses.	12870
19.10.18	Calculation	The singularity problem in the calculation of the <b>deflection in the cracked state (condition II)</b> has been fixed.	13088
25.04.18	Output document	The graph of the crack width has been added in the short list.	12457
25.04.18	Design	The shear design in the area of the support has been corrected due to a too small inner lever arm.	12492
25.04.18	User interface	The default value (c.vL) for the offset dimension of the longitudinal reinforcement is now 3,5 cm.	12166
25.04.18	Input	New loads can now also be added in the tree view.	11386
25.04.18	Input	There is now the possibility in the tree view to mask out the action(s) in a load case via the function "show only load cases".	11387
25.04.18	Output document	The labelings of cross-sections at notches covered each other here and there.	11182
25.04.18	Output document	In rare cases the reinforcement distribution was not labeled entirely.	11651
25.04.18	Output document	If a decompression analysis is selected, which is not necessary due to the exposure class, a hint that no analysis has been carried out is issued.	11760
25.04.18	Output document	An error message is issued, if the reduced web width for a shear force design approaches zero, e.g. due to the reduction of the duct.	11761
25.04.18	Output document	The position of the neutral axis and thus the x-axis of the T-sections was displayed at the wrong position.	11975
25.04.18	Design	<b>Initial cracking in the notch area</b> The wrong cross-section height was assumed in the analysis according to CSN EN.	11649
25.04.18	Design	<b>Fire protection</b> The reinforcement dimensions between axes were logged wrongly for systems with notches.	12437
25.04.18	Design	Notches were not considered in the automatic calculation of the characteristic torsion values.	12458

Build	Module	Description	ID
25.04.18	Design	<b>Fire protection</b> Notches with a small height were not recognized for slabs.	12477
25.04.18	Design	The specified (modified) prestressing steel material has not been correctly transferred to the result list and was only applied correctly in the 2nd calculation run.	12493
25.04.18	User interface	The selected prestressing method with the strand type and diameter was not completely legible in the tab "Prestressing".	9587
25.04.18	User interface	Single loads in x-direction were displayed in the wrong position, since the input of eZ relates to the neutral axis of the beam.	11183
25.04.18	User interface	The setting for the "effective slab width" is now also in the property window and no longer in the dialog "Calculation options".	11250
25.04.18	Calculation	After the input of a support settlement a single load of 20kN has been formally generated and displayed.	12048
25.04.18	User interface	The dynamic increase factor according to DIN EN 1991-1-1 (6.3) can be specified for the fatigue analysis. The default value is 1,40.	12341
25.04.18	Analyses	In order to calculate the <b>deflections in the cracked state</b> effective stiffnesses are being determined, which result from the moment effects and the curvatures due to creep and shrinkage. The proportion from shrinkage has been corrected.	12509

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Build	Module	Description	ID
21.03.18	Output document	The stated double shear stirrups of the web are the maximum value of the structurally required shear force reinforcement + double vertical torsion reinforcement and the minimum stirrup reinforcement. A comparison with the web stirrup proportion from the shear joint design was missing in the part of the structurally required shear force reinforcement.	12420
17.01.18	Output document	The value $f_{cd}$ was issued incorrect in the table of the material, if $\alpha_{cc}$ differed from the standard.	11952
17.01.18	Output document	The <b>robustness reinforcement</b> was not correctly distributed on the flanges.	11955
17.01.18	Design	<b>Fire protection</b> Rectangular cross-sections with $b = 1,00$ m are considered as slabs.	12008
17.01.18	Calculation	The settlement value was applied twice for load cases with the attribute "Support settlement, possible".	12047
29.08.17	Output document	ZEICON opened the generated ZAC in an empty MSB for an <i>individual layout of the stirrups</i> in the reinforcement drawing. This problem did not occur with RTviewer.	11203
29.08.17	Output document	<b>Reinforcement from the bending bearing capacity in the bottom flange</b> The reinforcement in flange was not saved, if the axis distance $d_1$ was greater than the flange width.	11686
29.08.17	Output document	In the recess design with varying reinforcement distances of recess and girder, the $d_1$ of the recess was applied for the girder.	11689
29.08.17	Design	<b>Fire protection analysis</b> The required reinforcement can be provided with a factor in the fire protection analysis. With this the critical temperature $T_{crit}$ is increased, which has been ignored for very small $M_{Ed,fi} < 1$ kNm however.	11274
29.08.17	Design	<b>Limitation of the crack widths according to CSN</b> Unreasonable crack spacings $s_{rmax}$ result for very low reinforcement ratios in the flanges of T-beams for EN 1992-1-1. This is now trapped, as it is already in the area of the web.	11388
29.08.17	Design	The wall thickness of the equivalent hollow girder for the torsion design ( $A_{web}/u_{web}$ ) may not be smaller than $2 \cdot d_1$ , according to DIN only $2 \cdot d_1$ . From now on, the smaller value from $d_{1u}$ , $d_{1o}$ and additionally $cvL + \min(ds)/2$ is applied for $d_1$ . For very small and high webs no usable $A_k$ for the design resulted.	11687
29.08.17	Design	For a shear force reduction due to single loads close to a support, the utilization of the shear design was calculated with the unreduced $VE_d$ .	11688
29.08.17	Design	<b>structural fire protection</b> The minimum web height for a trilateral flame application was calculated as for a quadrilateral flame application.	11718
02.05.17	Design	<b>Ductility reinforcement in the notch area</b> The static height to be applied was incorrect in the area of a notch.	11269
02.05.17	Design	<b>Concrete compressive stresses in prestressed components</b> In the analysis of the concrete compressive stresses of prestressed components, the variance coefficient has been corrected corresponding to the new EN standards.	11290
10.04.17	Output document	<b>Reinforcing steel masses</b> <ul style="list-style-type: none"> <li>if a reinforcement has been selected with BEWE, then the <b>reinforcing steel masses of the selected reinforcement</b> are issued in the result list</li> <li>if no reinforcement has been selected, then the <b>reinforcing steel amounts of the required reinforcement</b> are issued in the result list</li> </ul>	11011
10.04.17	General	The possibility to select a quadrilateral flame application has been removed.	11193
10.04.17	Output document	<b>Fire protection analysis of slabs</b> The wrong table was used for the axis distance of the reinforcement, if the slab width was not exactly 1,00 m.	11181

Build	Module	Description	ID
10.04.17	Design	<b>Notches in slabs</b> In order to be considered, notches in slabs must have a minimum height of 2 cm now.	11184
10.04.17	Design	<b>Stress-strain curve for reinforcing steel</b> The steel strain has been limited to 10 ‰ for the limit states of serviceability and fatigue, i.e. the stress-strain curve for reinforcing steel maximally ranges from -10 to +10 ‰.	11208
10.04.17	User interface	Was the first span deleted in a system with a general cross-section run, then this sometimes caused a program termination.	11119
21.02.17	General	The prestressing method database has been extended with the prestressing method for single strands without bond by DSI.	10843
21.02.17	Output document	The effective slab width is issued as diagram and additionally as table in the detailed list.	9928
21.02.17	Output document	The value $h_{w,min}$ in the legend of the tabular fire protection has been replaced with "Beam height", since the minimum height is also used for cross-sections without a web.	10173
21.02.17	Output document	The tendon geometry is now being pictured. Furthermore, the prestressing force diagrams do also contain the distribution from the individual prestressing steps.	10350
21.02.17	Output document	Instead of the design stress resultants does the stress resultant output now contain the combination stress resultants without modifications for the design such as rounding offs, minimum moments or section moments. The moments applied in the design are still issued in the tables of the calculated reinforcement.	10591
21.02.17	Design	<b>Tensile force and shear force coverage</b> A calculation with a subsequent selection of the reinforcement can now be carried out. This means a reinforcement is selected in a way, that the required longitudinal reinforcement including the offset dimension (tensile force coverage) and the required shear reinforcement (shear force coverage) are covered. The <u>selected reinforcement</u> is depicted in the graphs of the longitudinal reinforcement and shear reinforcement and is issued in the result list with a table. The material requirements are adjusted depending on the selected reinforcement.	11037
21.02.17	Design	<b>Reinforcement drawing</b> For continuous beams with a constant cross-section run, a reinforcement drawing can be exported to RTviewer. There it can be displayed including offset dimension and anchorage length. Is ZEICON installed, then this program is opened instead of RTviewer.	11038
21.02.17	User interface	The normative value for the admissible crack width can now automatically be determined by the program, for what "Crack width automatically" has to be ticked in the property window. Is this checkbox not ticked, then the crack width can still be specified.	9835
21.02.17	User interface	The input of the coefficients for the fatigue analysis has been extended with the number of load cycles.	9940
21.02.17	Calculation	The moment redistribution has been enhanced with a more differentiated examination of the original load cases, in order to comprise the dependency of the superpositioned span moments from the support moments to be reduced. With this, sometimes more favorable action effects result on the bottom side of the beam.	10982
21.02.17	Output document	The cross-section values $A_c$ and $I_y$ were not issued for a slab cross-section.	10612
21.02.17	Output document	The hint was missing, that lateral loads in y-direction are only considered in the torsion design.	10769
21.02.17	Design	<b>Tabular fire protection</b> A minimum web height has to be proven for recesses and notches. $h_{min}$ was possibly calculated too unfavorable, which is why the interpolation of the tabular values has been revised.	10205
21.02.17	Design	<b>Deformations in the cracked state</b> The shrinkage proportion was not considered sometimes, if only the bending and shear strength as well as the deformations in the cracked state were to be proven and no reinforcement has been specified. The shrinkage proportion was always considered correctly in all other cases.	10399
21.02.17	Design	The setting "No minimum shear force reinforcement" was not being considered.	10925

# Release Notes

## BALKEN



Build	Module	Description	ID
21.02.17	User interface	The possibility to enter an eccentricity is now enabled / disabled in accordance with the selected load direction.	9881
21.02.17	User interface	Now a rectangular cross-section with the slab characteristics is offered for the type <i>Uniaxial element slab</i> under <i>Edit cross-section</i> in the quick input.	10113
21.02.17	Input	The selection of "Type 1" as system type was not saved, whereby it could not be set directly.	10549

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Build	Module	Description	ID
13.02.17	Design	The required reinforcement at the support is no longer considered for a minimum reinforcement in the span.	10889
13.12.16	Design	The distance delta.x according to figure 6.7 of the EN was sometimes not calculated correctly due to numerical tolerance issues, which could cause small asymmetries in the results.	10516
13.12.16	Design	For the shear force design the strut inclination has been limited for all national annexes according to DIN EN eq. 6.7a.	10519
12.11.16	Output document	Adjustment of the reinforcement graph (edge distances) for the post design.	9749
12.11.16	Output document	Output of an extra graph for the additional shear joint reinforcement, if it is required.	10503
12.11.16	Design	<b>Robustness reinforcement</b> Different center distances of the top and bottom reinforcement layers are now being considered.	10013
12.11.16	Design	The anchorage reinforcement at the support has been limited to max.As.bottom of the associated span according to EN 6.2.3(7).	10270
12.11.16	Design	Live loads are being considered in the cyclic loads in the fatigue analysis, if the load case is marked as fatigue load case. Other live loads are also included in the non-cyclic basic load with the frequent value. Shear forces for the fatigue analysis are now taken from the combination with the shear force as leading value. The lambda values are set to 1.0 for the general building construction.	10284
12.11.16	Design	A differing reinforcing steel quality for the shear joint was not considered in the latest program version.	10428
12.11.16	Design	In the output of the previous version, the part from torsion has been added twice to the required shear force part in the design for torsion.	10449
12.11.16	Calculation	Varying partial safety factors, differing from the standard, were not always considered correctly in the design combinations.	10394
12.11.16	Calculation	The load case attributes earthquake-x and earthquake-y were not considered in the design hitherto.	10396
18.08.16	Output document	<b>Fire protection</b> The tabular fire protection analysis in the area of the notches has been corrected.	9949
18.08.16	Output document	Accidental loads were missing in the accidental design combination, if no other loads of the same live load category existed.	9951
18.08.16	Design	<b>Tabular fire protection analysis - slab</b> Disproportionately high critical temperatures were calculated due to minimal stress resultants at the beam ends (numerical effects). This caused, that the required edge distance was equal to 0.	9836
18.08.16	Calculation	The assignment to leading and accompanying actions for groups of actions when generating combinations is now carried out more differentiated via a direct comparison of the combined stress resultants.	9959
16.07.16	Design	Up to now, the load case attribute "exclusive load" has not been considered in the design combinations.	9918
16.07.16	Design	The anchorage analysis of the prestressing strand has been corrected for notches.	9938
10.06.16	Design	In addition to the friction forces from vertical load, also horizontal support forces are considered in the design of notches. These loads are listed as VEd and HEd in the result list.	9868
10.06.16	Output document	In the version from 08.04.2016 it could happen, that a minimum reinforcement specified span by span was assigned to the wrong span.	9788
10.06.16	Design	Different partial safety factors for dead load and permanent loads can be considered for the handling of special cases.	9882

Build	Module	Description	ID
10.06.16	Calculation	For constant bedding distributions it could occur, that in the calculation only half the bedding was applied in the front area.	9873
14.03.16	Design	The superposition has been corrected for when fatigue load cases exist.	9672
14.03.16	Design	The adhesion coefficient $c$ is zeroized or divided in half, depending on the selected standard, in the shear joint design with existing fatigue load cases.	9673
14.03.16	Design	An increased shear reinforcement due to fatigue is displayed in the graph.	9674
14.03.16	Calculation	The girder loading was sometimes incorrect with multiple existing temperature load cases.	9632
14.03.16	Calculation	A hint about a non-symmetrical cross-section means, that the calculation assumes a centered position in the web for the centroid as well as for the shear center. Hereby, a program termination could occur.	9678
27.01.16	General	The option <b>reinforced concrete girder</b> provides the following options amongst others: <ul style="list-style-type: none"> <li>Analyses according to DIN 1045-1 and EN 1992-1 with national annexes for DE, AT, SK/CZ and UK</li> <li>homogeneous rectangular, T-beam, slab, standard I-beam cross-sections with variable web and flange thicknesses as well as upstand beam cross-sections</li> <li>structural systems with an unlimited number of spans and automatic consideration of the effective slab widths for the stress resultant calculation</li> <li>optional use of normal-strength concretes (up to C50/60), high-strength concretes (C55/67 up to C100/115), ultra-high strength concrete (UHC140)</li> <li>reinforcing steel reinforcement (up to B550), high-strength reinforcing steel reinforcement (SAS670) or glass fiber reinforcement (ComBAR®)</li> <li>rigid or elastic support with automatic calculation of the spring coefficients</li> <li>complete reinforced concrete design in the ULS</li> <li>minimum and ductility reinforcement</li> <li>tabular fire protection</li> </ul>	9568
27.01.16	General	The option <b>prestressing</b> provides the following options: <ul style="list-style-type: none"> <li>single-level prestressing – pretensioned or post-tensioned</li> <li>database with all current prestressing methods</li> <li>prestressing with up to 4 prestressing conditions per side including wedge slip</li> <li>prestressed concrete design under consideration of creep, shrinkage and relaxation</li> <li>tensile splitting reinforcement for pretensioning</li> </ul>	9572
27.01.16	Analyses	The new option <b>Analyses in the SLS, FLS and refurbishment</b> provides the following options: <ul style="list-style-type: none"> <li>minimum reinforcement for the crack width of thin and thick structural members</li> <li>minimum reinforcement due to discharge of the hydration heat for slabs</li> <li>limitation of the crack width</li> <li>limitation of concrete and steel stresses II</li> <li>limitation of the deformations in the uncracked state</li> <li>limitation of the effective deformations in the cracked state for <math>l_{eff}/250</math> and <math>l_{eff}/500</math></li> <li>deformations optionally for quasi-permanent, frequent or rare combination of actions</li> <li>analysis against fatigue of the longitudinal reinforcement</li> <li>analysis against fatigue of the shear reinforcement or stirrups</li> <li>load bearing capacity analysis for refurbishment with utilization levels for a specified longitudinal and shear reinforcement under consideration of possible corrosion damages</li> </ul>	9570
27.01.16	Analyses	The new option <b>detail analyses</b> provides the following options: <ul style="list-style-type: none"> <li>design of geometrical discontinuity areas for small and large openings (recesses) according to DAfStb Heft 399 and DAfStb Heft 459</li> <li>post design for openings closely spaced <math>&lt; 0,8 h</math></li> <li>design of geometrical discontinuity areas for offset supports (notches)</li> </ul>	9573

## Structural steel

### Version 18.0

Build	Module	Description	ID
25.04.18	Design	Solely horizontal supports are also considered for the calculation of the span lengths in the lateral torsional buckling analysis.	11895
25.04.18	User interface	The graphic in the view was misleading for line loads in x- and y-direction. Now, the loads are additionally labeled with $p_x / p_y$ and the arrow in the z-direction has been removed.	9840
25.04.18	User interface	For structural steel a wrong help text was displayed in the property window.	10348

### Version 17.0

Build	Module	Description	ID
10.04.17	Analyses	For the lateral torsional buckling analysis according to EN 1993-1-1 (and national annexes) it has to be user-defined, whether the calculation of the interaction coefficients $k_{ij}$ of the girders has to be classified as torsionally rigid (table B.1) or as torsionally flexible (table B.2) structural member. For torsionally rigid structural members the simplification, that for I-beams and hollow cross-sections, which are loaded in compression and uniaxial bending, the coefficient $k_{zy} = 0$ may be assumed is still used.	11200
21.02.17	Output document	Revision of the short list.	10510
21.02.17	User interface	The name of a load case could not be modified, because this column was missing in the tab "Load cases".	9622

### Version 16.0

Build	Module	Description	ID
12.11.16	Design	If a lateral torsional buckling analysis can not be carried out for particular section types, a message is being displayed. Results are no longer issued in this case.	10349
12.11.16	User interface	The structural values of the cross-sections are now displayed in the property window.	9689
12.11.16	Analyses	The lateral buckling analysis has been enhanced for user-defined sections (welded sections) and modified material coefficients. Confinements for some section types concerning the analysis possibility remain unaffected from this.	10404
10.06.16	Output document	The deflection analysis was carried out for the leading vertical deformation with the corresponding horizontal value. From now on, also the extremal horizontal deformations are being issued.	9837
10.06.16	Output document	The plastic utilization is optionally issued also when the elastic utilization is complied with.	9841
10.06.16	User interface	Also the appropriate values in the lateral direction are issued in addition to the extremal deflections.	9838
14.03.16	Calculation	Various steel sections were hitherto offered, but still not supported. Now all available sections can also be calculated.	9667
14.03.16	Calculation	The load application point of the lateral loading for lateral torsional buckling has been adjusted internally from the centroid to the upper edge of the section. A user-defined input of the load application point is not possible right now.	9725
27.01.16	General	The new option <b>structural steel girder</b> provides the following options: <ul style="list-style-type: none"> <li>Analyses according to DIN 18800 and EN 1993-1 with national annexes for DE, AT, SK/CZ and UK</li> <li>I-, T-, U-, O- and rectangular sections from the section database</li> <li>symmetrical welded sections</li> <li>constant cross-section gradient per span</li> <li>elastic stress calculation EE due to NM-V-T interaction</li> <li>automatic plastic analyses EP, if utilization of the elastic stress analyses is exceeded</li> <li>lateral torsional buckling for I- and U-sections</li> <li>deformations alternatively for quasi-permanent, frequent and rare combination of actions</li> </ul>	9566

## Timber

### Version 18.0

Build	Module	Description	ID
25.04.18	General	Program maintenance and support	12520

### Version 17.0

Build	Module	Description	ID
21.02.17	General	Program maintenance and support	11034
21.02.17	Output document	Revision of the short list.	10312
21.02.17	User interface	The cross-sections can now be specified differently for each span.	9966
21.02.17	User interface	The name of a load case could not be modified, because this column was missing in the tab "Load cases".	10947

### Version 16.0

Build	Module	Description	ID
13.12.16	Calculation	The support forces in the basic combination were calculated too high for the setting "Snow for the North German Plain".	10640
31.03.16	Analyses	In some cases of the carrying capacity analyses the decisive stress resultants were not used.	9752
14.03.16	Design	<b>Dynamic analysis</b> The program has been extended with dynamic analysis for timber floors, respectively, timber joist floors.	9730
27.01.16	General	The new option <b>timber girder</b> provides the following options: <ul style="list-style-type: none"> <li>Analyses according to EN 1995-1 with national annexes for DE, AT, SK/CZ and UK</li> <li>rectangular sections out of softwood, hardwood and glued-laminated timber</li> <li>constant cross-section gradient per span</li> <li>stress and lateral torsional buckling analysis including torsion</li> <li>calculation of the support pressure</li> <li>hot design, respectively, fire protection</li> <li>limitation of the deformations for initial and final deformations</li> </ul>	9567