ARMID 2011

ArcelorMittal Design
for Steel Fibre Reinforced Slabs on Grade

ARMID Software is a design tool for steel fibre reinforced concrete slabs on grade designed in accordance with TR34. ARMID Software has been developed in close cooperation with Weitendorf Software GmbH and ArcelorMittal Wire Solutions.

ARMID software designs are based on principles outlined in Technical Report 34 (TR34), the UK document which defines and describes SFRC industrial floors using plastic design methods which incorporate the yield line theory. Industrial slabs on grade are generally considered to be non-structural elements. They can therefore be designed according to TR34 without regard to national design codes, when those codes or laws do not specify otherwise. ARMID software allows for industrial floor designs with and without shrinkage joints.

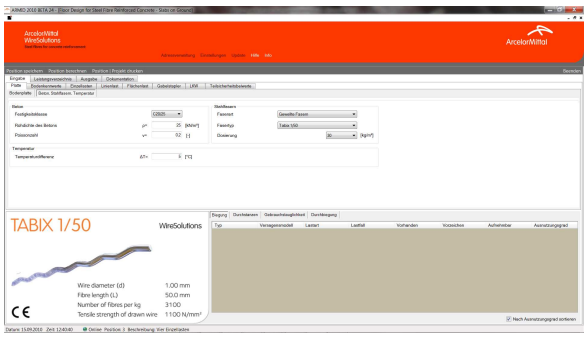
Data input

The data input is using tabbed navigation. Input is split into tabs for slab data (slab thickness, concrete grade, type/size and dosage rate of fibre), soil data and load data, as well as data relating to the partial safety factors used.

Slab data

- slab thickness
- jointless slab (TAB-Floor™) or slab with saw-cut joints (TAB-Fiber™)
- slab position (internal/external area)
- indicate shear transmission at the edge yes/no
- distance between joints with an indication of the maximum allowed distance as a function of the fibre type and the dosage rate
- selection of the concrete strength class
- selection of the fibre type and the dosage rate
- define temperature variations between the top and the bottom of the slab

The main characteristics of the selected fibre (length, diameter, number of fibres per kg and tensile strength of wire) are shown on the bottom left of the main window.



Picture 1: Program interface „Material data"

Soil data

- input either through sub-grade modulus k according to Westergaard, CBR-value (%) or EV2 and EV1 values according to DIN 18134
- input different sub-grades including the related friction parameters
- possible manual modification of the friction parameters
- possibility of taking into account insulation underneath the slab

Load data

- single point loads
- combined point loads (up to 4 loads) aligned or grouped
- line loads
- surface loads for uniform distributed loads defined either by one or two block loads
- fork-lift trucks and or other vehicular loads
- all loads can be defined as permanent, variable or dynamic loads
- allows for the possible exclusion of load cases „edge" and/or „corner" for jointless floors
- allows for combinations of load cases such as fork-lift truck and rack (point) loads
- provides the ability to consider block loads (pallet storage) under a racking system

ArcelorMittal

ArcelorMittal Bissen S.A.
P.O. Box 16
L - 7703 Bissen
T +352/835772 - 1
F +352/835772 - 209
E fibressupport@arcelormittal.com
I www.arcelormittal.com/steelfibres

WEITENDORF
Software für Tragwerksplaner

Weitendorf Software GmbH
P.O. Box 10 12 20
D - 31762 Hameln
T +49/5151/78 444 8 - 0
F +49/5151/78 444 8 - 7
E info@weitendorf-software.de
I www.weitendorf-software.de

Design

Designs are done for all specified load cases and load case combinations. After computing all load cases, all combinations are shown in a window, where they can be sorted according to the decreasing utilization rate, so that the user can see immediately which load case or load combination governs the design. The design verification is split into four categories: "Bending ULS", "Punching Shear ULS", "Verification SLS" and "Deflexion", which can be accessed through their various tabs. A coloured bar at the bottom indicates immediately if the design is permissible or not. Additionally, load cases with a utilization rate greater then 1.0 which are not permissible are shown in red.

Picture 2: Solicitations by load case

TR34 is based on the plastic yield line theory. The principle of this theory is based on discovering for each load case or load case combination the critical failure mechanism and to compute from there the ultimate bearing capacities, which are to be compared with the load induced stresses by taking into account the different partial safety factors.

Databases

The software contains the following databases:

- $R_{e,3}$ – values of all ArcelorMittal steel fibres describing the post-cracking behaviour of SFRC
- Maximum joint distances for TAB-Floor™ and TAB-Fiber™ solutions as a function of the concrete grade, the fibre type and the fibre dosage rate

Databases are regularly updated.

Administration

- Project administration
- Position administration
- Customer address administration
- Project output for single, all or selected positions
- Steel fibre data sheets and execution details
- Access to user manuals and help files
- Online updates via the internet
- Multi-lingual input and output, where the input and output language can be different. Available languages are: English, German, French, Dutch, Polish and Czech. Additional languages are under development.

Shipment content and prices

The purchase of an ARMID licence comprises the delivery of a CD containing the described software and the user manuals along with free hot-line support.

Costs 1st licence	300.00 €*
Costs 2nd licence	240.00 €*
Costs 3rd and more licences	180.00 €*

The purchase of a hard-lock protection key (USB Key) for 95.00 €* is required for each licence in addition to the licence fee.

Price list for updates on demand.

*) All prices are given without VAT and shipping costs

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I www.arcelormittal.com/steelfibres

Weitendorf Software GmbH
P.O. Box 10 12 20
D - 31762 Hameln
T +49/5151/78 444 8 - 0
F +49/5151/78 444 8 - 7
E info@weitendorf-software.de
I www.weitendorf-software.de