

Introduction

In this section, the main steps to perform an ACE session are explained for a multi storey building.

The emphasis is put on the sequence of commands. It is not meant to provide in depth information about every topic that can be encountered during an ACE session.

Installation procedure:

The software can be run under a Windows operating system (2000, XP, Vista, 7). It requires circa 20Mb of storage space.

ACE can be provided on a CD-ROM or via a USB drive, or can be downloaded from ArcelorMittal website: www.arcelormittal.com/sections. In order to install the software, run SETUP and follow the instructions. This procedure creates a default directory C:\Program Files\ACE in which all files are installed. If another directory is defined by the user, it is necessary to write down the exact path (Menu File–Path in ACE). The software may be executed under any name specified by the user (default ACE).

See Technical Notes document to learn about ACE in more detail.

The main steps to use ACE are as follows:

1. Start ACE

- 1.1 Choice of language
- 1.2 Calculation mode

2. Basic prices

- 2.1 Download on Website
- 2.2 Use predefined national prices list
- 2.3 Definition of new prices list
- 2.4 Use and save prices list

3. Input data

- 3.1 Define geometry:
 - 3.1.1 Define axis,
 - 3.1.2 Define columns,
 - 3.1.3 Create modules: beams orientation and scheme of floor system

3.2 Define Horizontal data

3.3 Define Vertical data

4. Results

4.1 Run application

4.2 Edit summary report

4.3 Select and edit Technical detailed report

4.4 Save the data

1. Start ACE

ACE can be started by clicking on the ACE icon in the Start Menu on the Desktop.

1.1 Choice of language:

A starting window appears, in which the language can be specified.
Available languages are: English, French, Dutch and Polish.

Click on START button to open a calculation session.

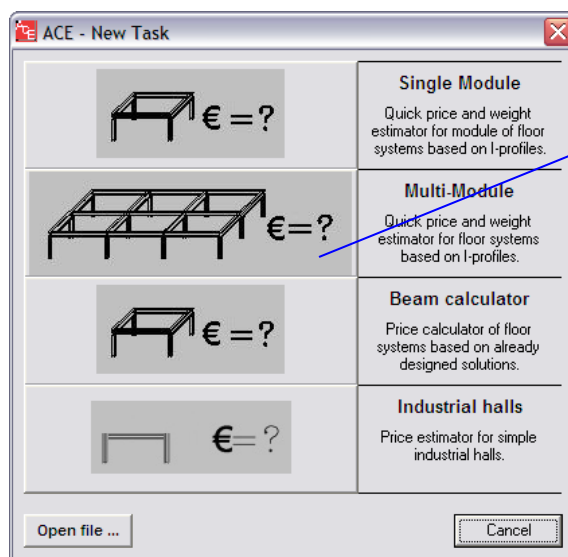
In order to choose a language to create and calculate a project, the user has to:

- choose a language at the start of ACE, run the application and print/save the project
- If the user wants to produce the output results in another language, the way to follow is:
- exit the software after saving of the project
 - run ACE again, choose the appropriate language for the output, open the project, run the calculation and print the report in the new language

1.2 Calculation mode

Four calculation modes can be performed:

- Single Module = Prices and weight calculation for one single module of floor system
- Multi Module = Prices and weight calculation for multi modules of floor systems of a multi storey building
- Beam calculator = Price calculation of floor systems based on already designed solutions (“Import function” with ABC or ACB results files)
- Industrial halls: Price and weight calculation of an industrial building



Click on one of the four graphical buttons to select the mode to continue the calculation session.

Fig. 1 New task window: choice of a session mode

1.3 Menu modules

The main window allows defining input data, running analysis and viewing the floor system model in the drawing blank area.

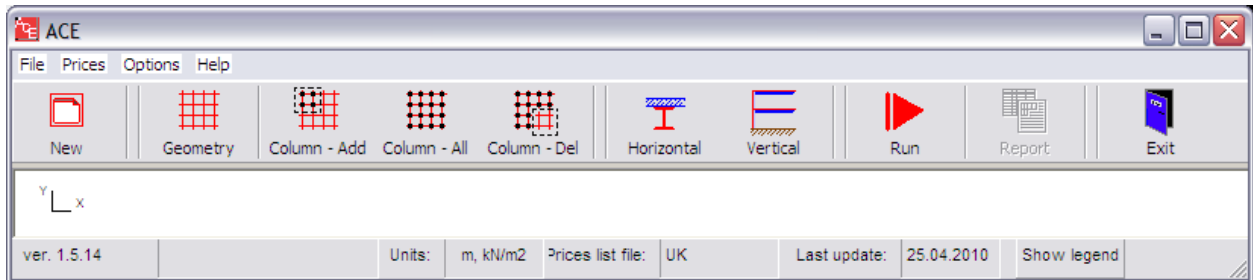


Fig.2 Main window of a Multi module session

2.

Basic prices

Three possibilities are given to use basic prices of list of materials (Button “**Prices**” in the toolbars):

- Load predefined prices lists, available for various countries: UK, Belgium, Luxembourg, Netherland, Portugal, Spain, France, Germany and Poland
- Edit prices to define a new prices list: prices editor with possibility to click on individual price to edit and modify

Update prices via Internet: download of national prices list from the Website

The price list in use is mentioned in the lower toolbars of the main menu as follows:

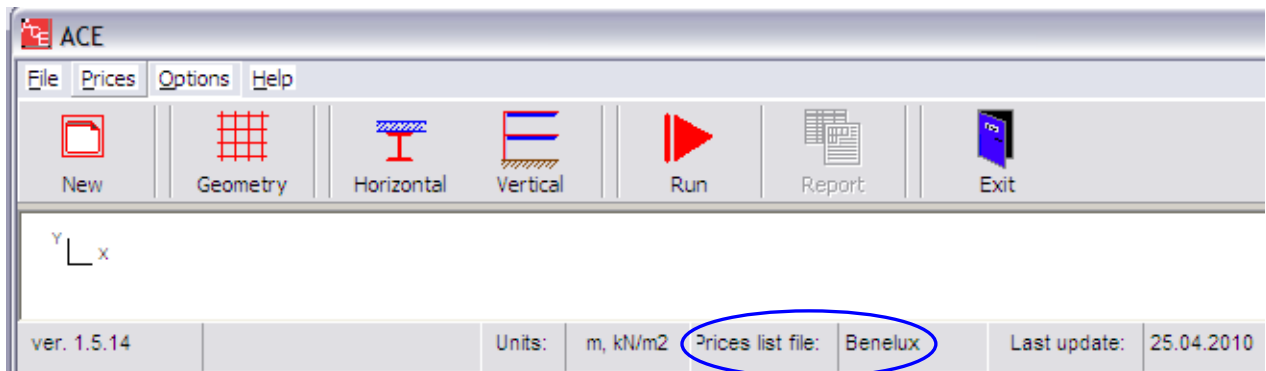


Fig 3. Main window of a Single module session

In any case, the prices list has to be saved by “Save as” with a specific name related to the project calculated. No prices list is saved simultaneously with the project itself. **Two separate files are to be saved for one project: the project itself with input and output data, and the basic prices list.** Pay attention that no basic prices are reminded in the calculation note.

NB: the choice of the language and national prices list are completely independent: if one language is chosen, it doesn't imply a choice of basic national prices list, which remains completely free. The opposite is also true.


3. Input data

3.1 Define geometry

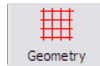
This section provides information concerning the input data definition for the calculation mode “Multi-module” (multi-storey building).

Two approaches are possible: an existing project can be used and recalculated, or a new project can be defined.

- Existing project: in the main menu click “**File**” tab, then “**Open**” and select the appropriate file. Note that for the use of prices, if the user wants to work with the same prices list used in the first project, he has to select the list which was related to that project (see previous section). If no prices list is selected, ACE software will proceed to the calculation with a prices list ‘by default’.

- New project: click on “**Geometry**” icon  and enter dimensions of the structure.

3.1.1 Define main geometry





For a new project, if an entire building is analyzed, the user has to enter geometry module by module, and in two directions (define coordinates for X Grid and Y Grid).



3.1.2 Define columns




For a new building (multi module), the user has to define the columns of the structure.

- Click on “Columns – Add” icon:  in order to define columns zone by zone,

or “Columns – All” icon:  in order to define columns in the entire geometry.

Note: if the geometry is not defined yet, nothing appears by clicking the tabs  or .

- Click on “Column – Del” icon:  in order to delete one or several columns in case of non rectangular building

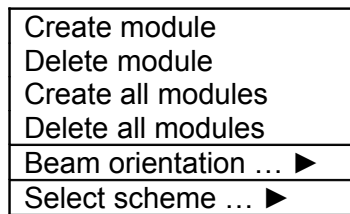
3.1.3 Create modules

The definition of the beams and the floor system is very specific as no tab is available in the tool bars of the menu.

However this operation is obligatory in order to be able to continue in the ACE session.

The way to define beams is described following:

- **Click the right mouse** inside the drawing blank area on the ACE screen: a new set of functions appears on the screen:



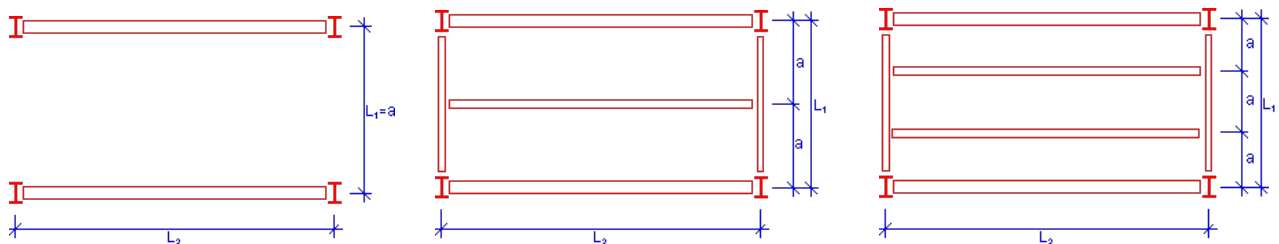
- The beams and floor system for the whole building can be created in one step by using the “Create all modules” function.
In case of non rectangular building, the functions “Create module” and “Delete module” allow to define particularities in the building geometry.

3.2 Define orientation and configuration (scheme) of floor system

At this stage, the floor system is defined with all possibilities of:

- secondary beams orientation (X or Y orientation for all modules), and
- scheme of floor system for all modules.

Three types of schemes are possible:



Scheme 1:
No intermediary
secondary beam in
the module

Scheme 2:
One intermediary
secondary beam in the
module

Scheme 3:
Two intermediary
secondary beams in
the module

Figure 4

The user has the choice to select particular beam orientations and schemes by **clicking the right mouse again:**

- Beam orientation function:

Create module	
Delete module	
Create all modules	
Delete all modules	
Beam orientation ... ▶	X direction
Select scheme▶	Y direction

- Configuration of floor system: scheme selection

Create module		
Delete module		
Create all modules		
Delete all modules		
Beam orientation ... ▶		
Select scheme▶	X direction ... ▶	
	Y direction ... ▶	Automatically
		1 st scheme
		2 nd scheme
		3 rd scheme

The next figure shows an example of a definition of floor system in order to highlight how colors are related to the different modules orientations: in this example possible solutions are configurations of floor systems with beams orientation in X direction and 1st scheme (no intermediary secondary beams)

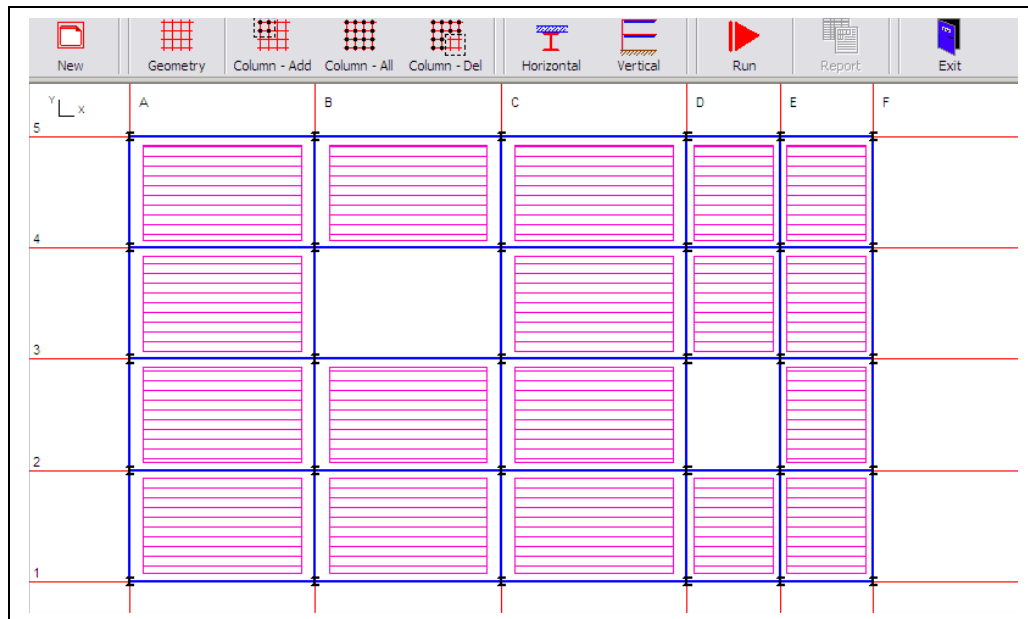
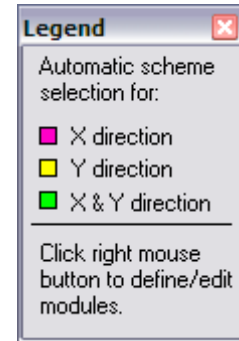



Figure 5. Main window: definition of a complete floor system

Fig 6 The legend describes how colors are related to different modules orientations: the selection of the beams orientation chosen in the figure 5 is X direction.




3.2 Horizontal input data

- Click the  icon

The definition of data in this part is:

- selection of types of beams and slab
- steel grade and concrete class
- fire protection requirements
- loads

3.4 Vertical input data


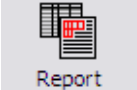
- Click the  icon

In this section, the definition of the data is divided into 3 pages or groups:

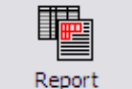
- foundations, ground floor, number of levels in a building, façades, columns, roof, bracing
- floor height including finishing, service and free space
- other non-structural items: prices for internal finishing, service and preliminaries (≠ overheads of steel contractor's)

4. Results

4.1 Run application

- Click the  icon to run the calculation. When the calculation is finished, the  icon is accessible.

4.2 Edit summary report

- Click the  icon to open the Summary report

This report presents all solutions which can be calculated on basis of the input data selection. A recapitulative table is given at the end of the report:

RESULTS (per m2 of total useable area):

No.	Code (1)	Floor height	Steel weight kg/m2	Price €/m ² (2) steel frame (3)	dations	waterproofing	facade	internal finishing	services	preliminaries	total	Module kg/m2

Fig 7 Example of recapitulative table in the summary report: one solution is available

(1) Legend for the code applied in column 'Code':

- Numbers 1, 2 or 3 at the beginning of the code stand for 'scheme 1', 'scheme 2', 'scheme 3', respectively.
- INS: I-profile, non-composite, steel deck
- INP: I-profile, non-composite, precast slab
- INH: I-profile, non-composite, hollow core slab
- ICS: I-profile, composite, steel deck
- ICP: I-profile, composite, precast slab
- ICH: I-profile, composite, hollow core slab
- ANS: cellular beam, non-composite, steel deck
- ANP: cellular beam, non-composite, precast slab
- ANH: cellular beam, non-composite, hollow core slab
- ACS: cellular beam, composite, steel deck
- ACP: cellular beam, composite, precast slab
- IFB: integrated floor beam
- SFB: slimfloor beam
- Numbers 2, 3 or 4 at the end of the code stand for 'S235', 'S355', 'S460', respectively.
- X: X direction orientation of secondary beams
- Y: Y direction orientation of secondary beams

(2) Price breakdown per m2 of usable floor area

(3) Steel frame = erected steel frame cost includes beams, columns, bracing, connections, studs, corrosion protections, transport, erection, propping/precambering and all associated labour cost and roof.

4.3 Select and edit Technical detailed report

The summary report can be extended by clicking the option “**Technical detailed report**” in the toolbar



This option allows selecting a case on the set of available solutions.

4.4 Save the data

The summary and Technical detailed reports can be printed and saved in Word documents.

Calculations of **global** prices are given in these reports.

Please note that no material prices are reminded (see §2 Basic prices), and that the prices list has to be printed separately, and/or saved in the format of 'file.prc' usable by the software.

The project can be saved in the format of 'file.ace' usable by the software.