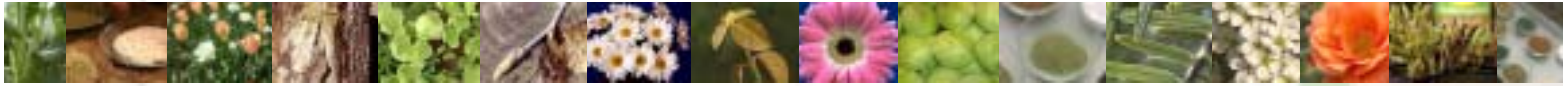
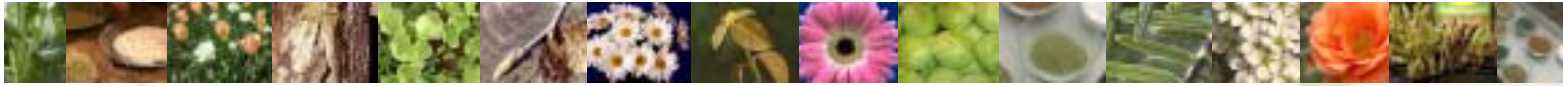


walk-in test chambers for biological research



- walk-in test chambers  
for biological research -  
*TIRA environmental simulation*



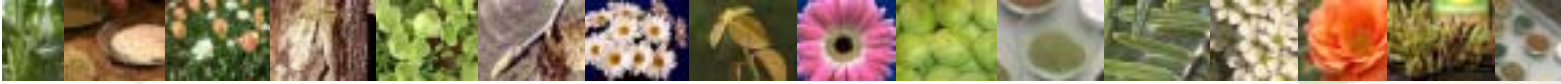
# operative ranges:

- *plant genetics*
- *cultivated plant research*
- *plant protection*
- *plant biochemistry*
- *plant physiology*

- *growth research*
- *cell cultures*
- *metabolic tests*
- *examining interactions*
- *phytopathology*
- *resistance tests*



walk-in test chambers for biological research • simulated environmental conditions



**sunlight**

**dryness**

**condensation**

**daily period**

**night/ day**

**heat**

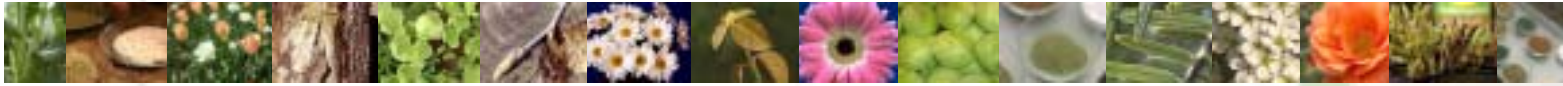
**fog**

**rain**

**frost**

**air circulation**

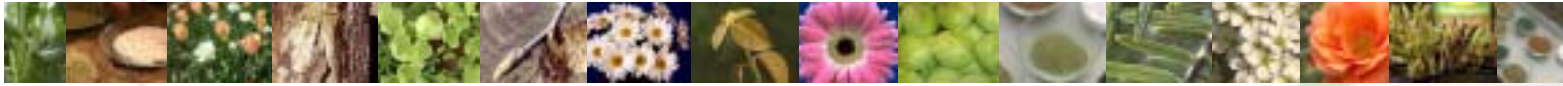
walk-in test chambers for biological research • simulated environmental conditions



## simulated influences: *standard chambers*

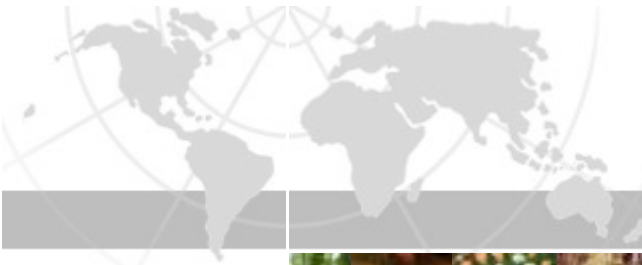
- *environmental conditions in the form of temperature and humidity*
- *light as source of energy and basis of the photobiological process*
- *irrigation at plant growth tests*

walk-in test chambers for biological research • simulated environmental conditions

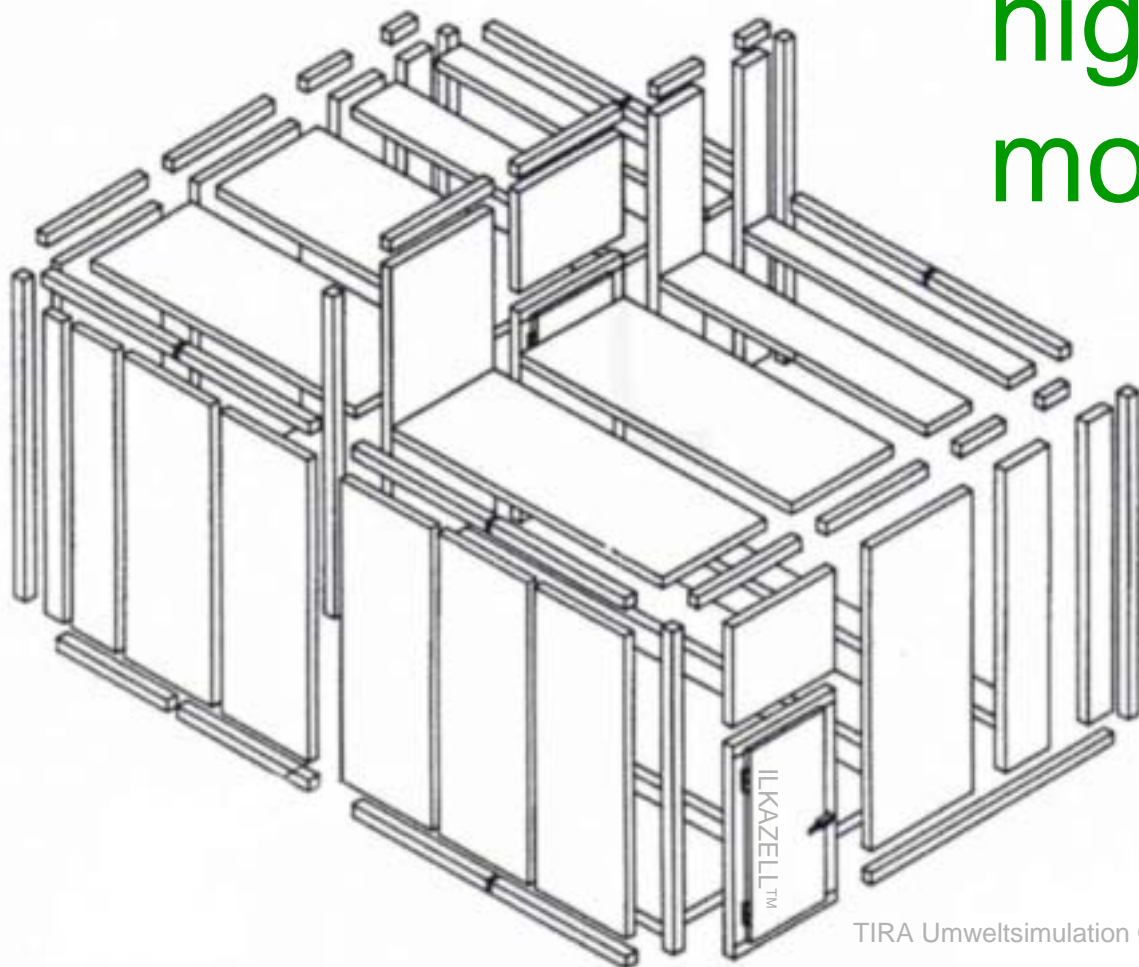
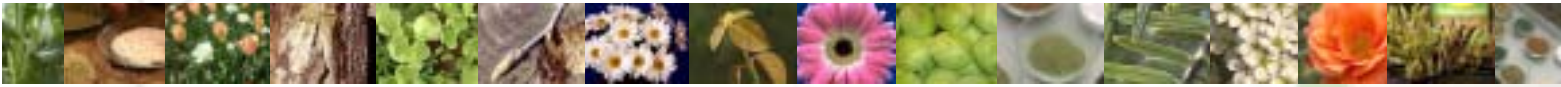


## simulated influences: *special execution*

- *rain with various chemical concentration*
- *fog combined with rain water and filtered air*
- *gas in various concentration as noxious- or useful gas*
- *wind through secondary air ventilation*



walk-in test chambers for biological research • modular design



# high-flexible modular design:

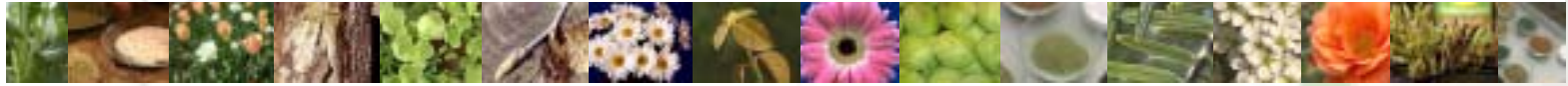
Insulating panel  
(\*grid size 250 mm)

K-value insulation thickness

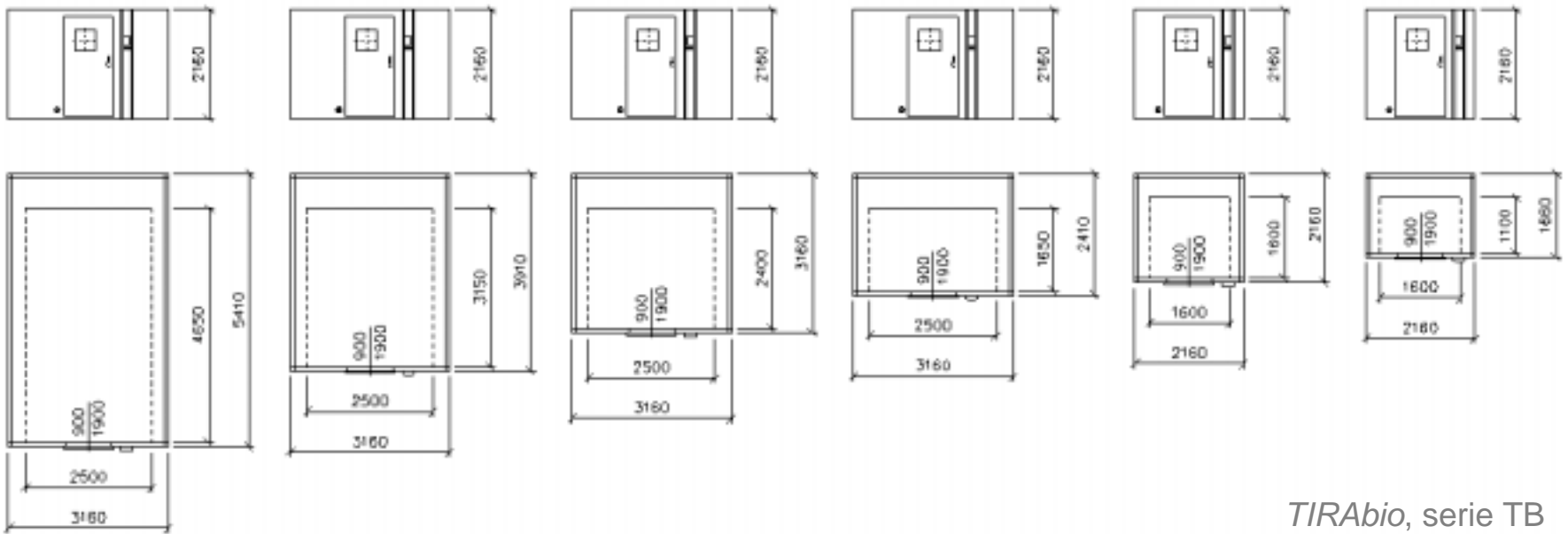
80 mm	0.24 W/m <sup>2</sup> K
100 mm	0.19 W/m <sup>2</sup> K
120 mm	0.16 W/m <sup>2</sup> K
150 mm	0.14 W/m <sup>2</sup> K



walk-in test chambers for biological research • modular design

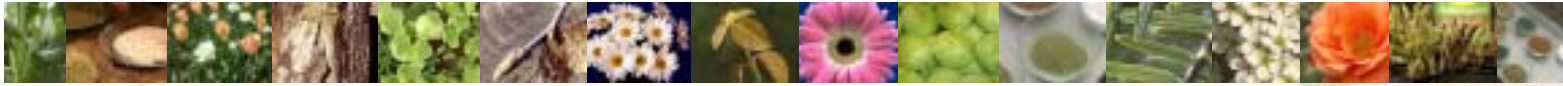


# high-flexible modular design:



TIRAbio, serie TB

walk-in test chambers for biological research • main technical components

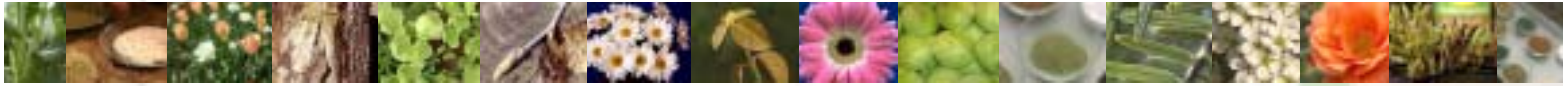


# main technical components:

- *chamber enclosure – insulating panel*
- *door module (single- or double-wing)*
- *switch cabinet with electrical controller*
- *machine unit – cooling compressor  
humidification unit*
- *air conditioning unit*
- *fresh air conditioning*



walk-in test chambers for biological research • main technical components



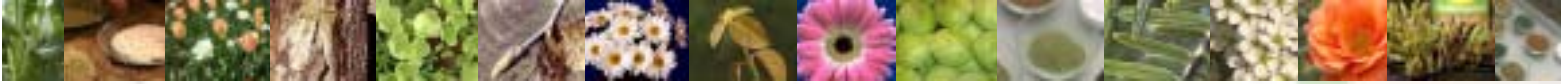
# main technical components: *chamber enclosure*



- *foamed CFC-free polyurethane elements*
- *friction-locked by eccentric turnbuckle joint, tongue and groove joint*
- *stable and self-supporting, thanks to the sandwich structure*
- *high variability by means of the post- system*



walk-in test chambers for biological research • main technical components



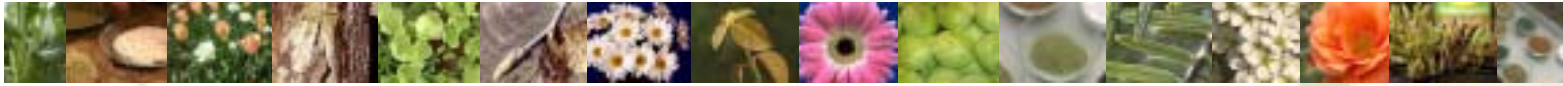
# main technical components:

## *door module*

- single- or double wing
- inspection window, different sizes
- door lock, several types



walk-in test chambers for biological research • main technical components



# main technical components:

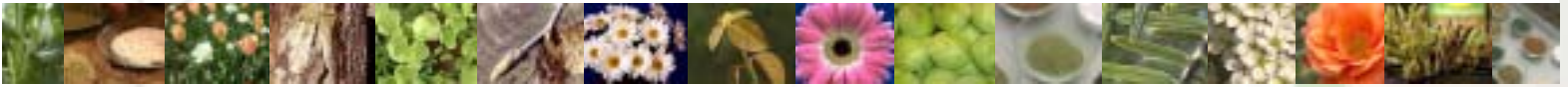
*switch cabinet  
with electrical  
controller*

**SIEMENS  
Simatic S7**





walk-in test chambers for biological research • main technical components



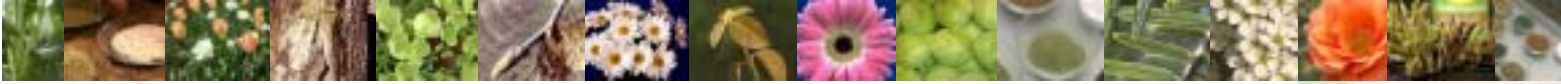
# main technical components:

*machine unit – cooling compressor*  
*humidification unit*





walk-in test chambers for biological research • main technical components



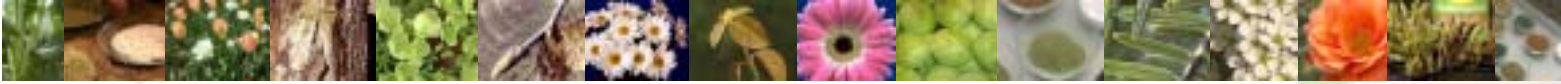
# main technical components:

## *air conditioning unit*

- 1 – fan for air flow circulation**
- 2 – cooling evaporator**
- 3 – dehumidification evaporator**



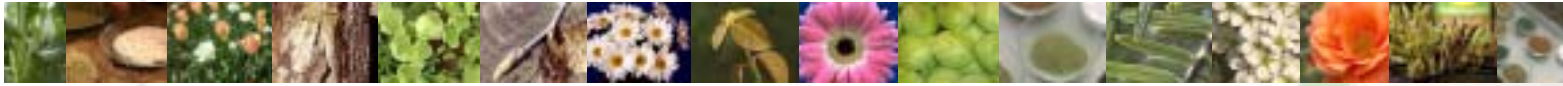
walk-in test chambers for biological research • main technical components



# main technical components:

*irradiation units  
with daylight spectrums*



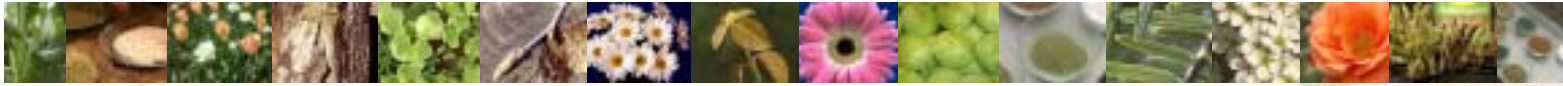


# main technical components:

## *irradiation units*

- *appr. 70.000 lux or customised*
- *height adjustable*
- *fluorescent lamps or HQI-lamps as standard;*
- *specials available on request (e.g. ultraviolet irradiation)*

- *Module 1: fluorescent lamps; fixed*
- *Module 2: fluorescent lamps; height adjustable*
- *Module 3: discharge lamp & glas-ceiling*



# walk-in test chamber: *TIRAbio-classification*

**TB 18 19.1 - Sole** ———

special remarks as e.g. brine cooling

Module 1: fluorescent lamps; fixed

Module 2: fluorescent lamps; height adjustable

Module 3: discharge lamp & glas-ceiling

internal height in „dm“

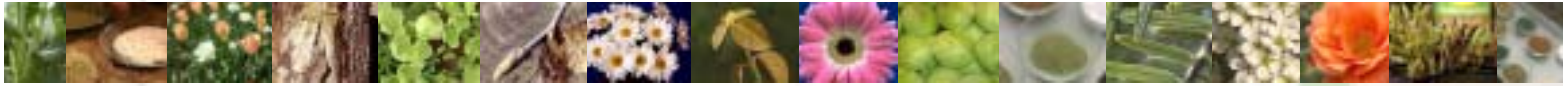
floor space required in 1/10m<sup>2</sup> (1,8m<sup>2</sup>)

BIO chamber

**TIRA**



walk-in test chambers for biological research • example

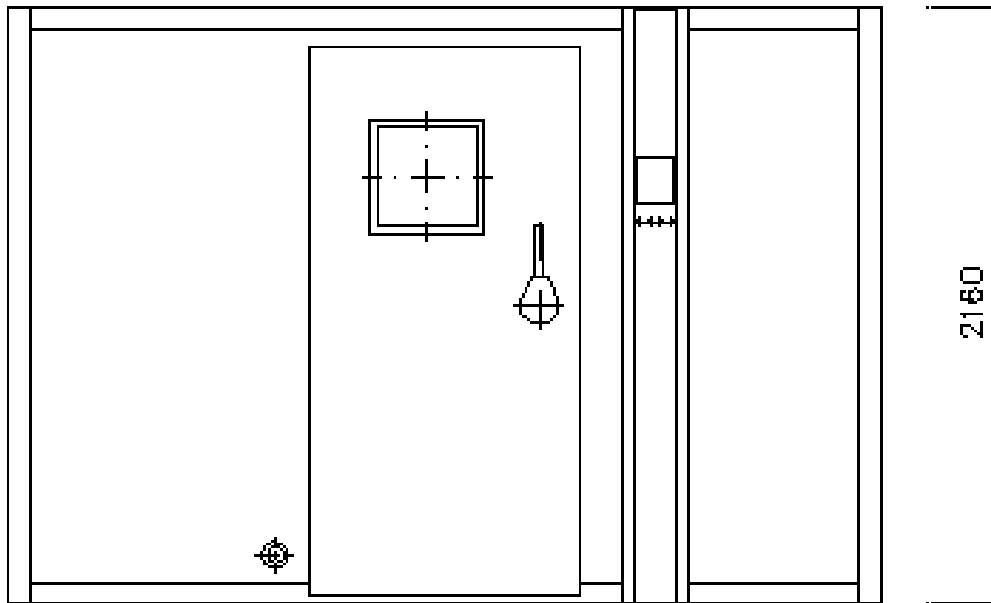


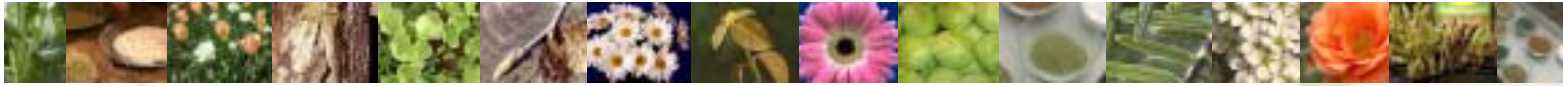
# walk-in test chamber:

*example*

*TIRAbio*

*TB 4319.1*



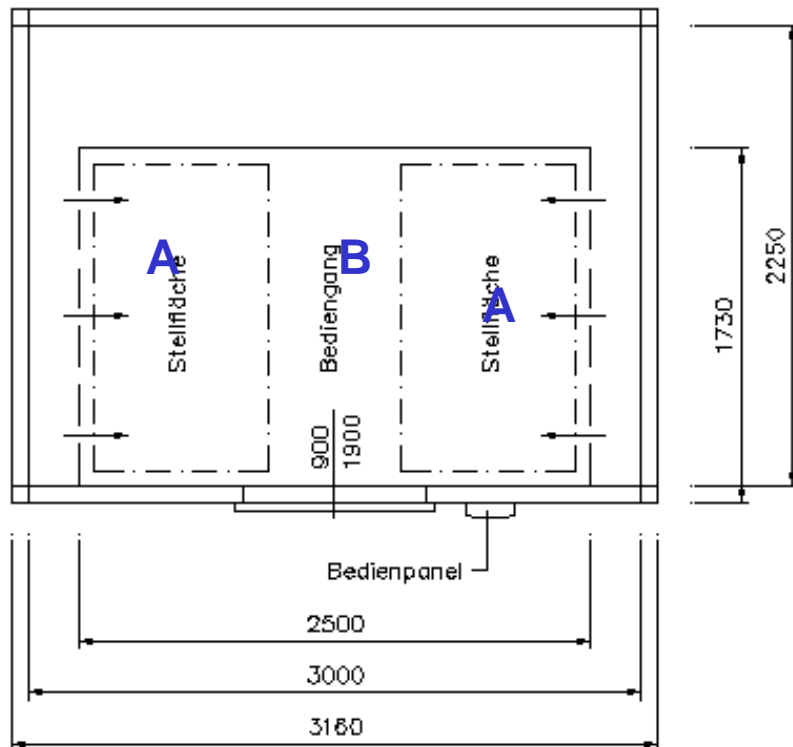


# walk-in test chamber:

*example*

*TIRAbio*

*TB 4319.1*

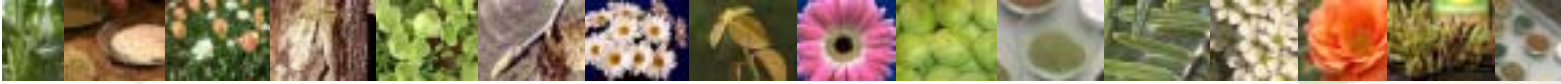


**A – floor space required**  
**B –way (to operate)**

TB 4319.1



walk-in test chambers for biological research • example



# walk-in test chamber:

*example*

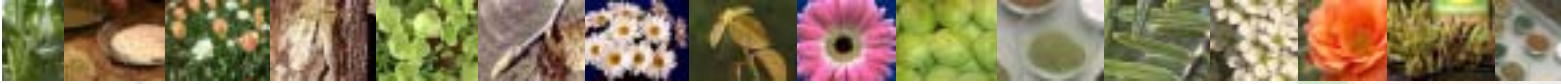
*TIRAbio*

*TB 11624.3*

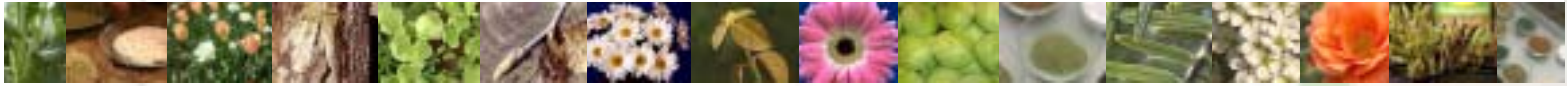




walk-in test chambers for biological research • example

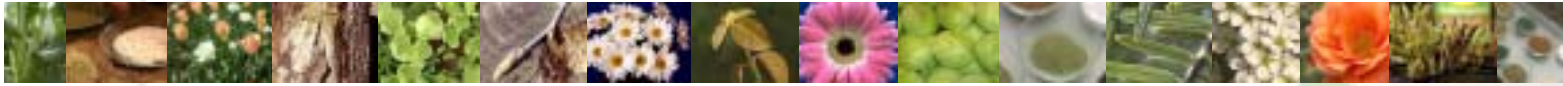


walk-in  
test chamber:  
*example*  
*TIRAbio TB 11624.3*



# main product characteristics:

- ✓ *modular design*
- ✓ *powerful, high-developed and overlapping control system- SIEMENS*
- ✓ *modern components*
- ✓ *environment friendly refrigerants and insulation material; CFC-free*
- ✓ *irradiation units with daylight spectrums*
- ✓ *low-emission rate*



## accessories: *plant desks*

■ **complete in  
stainless steel**

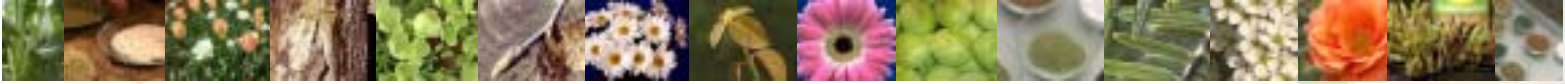
■ **adjustable in height,  
width, depth at a 100  
mm grid**

■ **grid support**

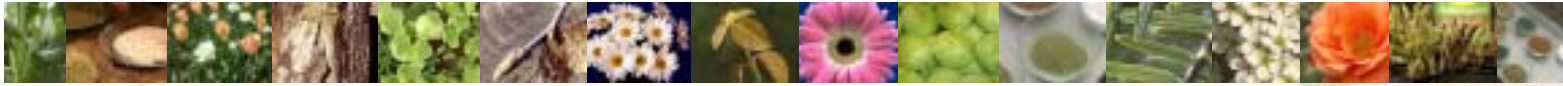




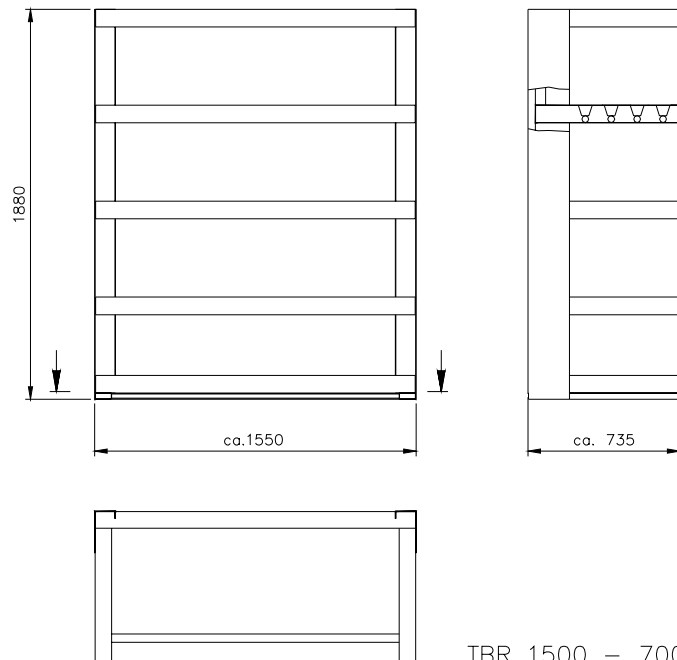
walk-in test chambers for biological research • accessories



**accessories:**  
*climatic sonde,*  
*portable*



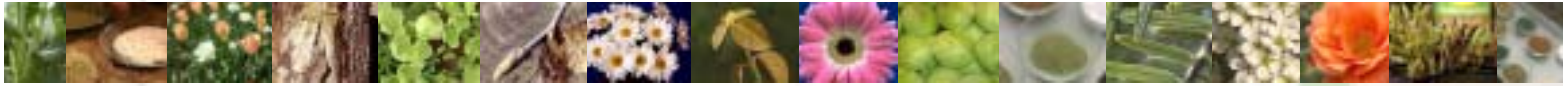
# rack- and shelf systems:



TBR 1500 – 700.4.4

■ *in modular design,  
an ideal supplement  
to air conditioned  
rooms,  
laboratories or  
walk-in bio-chambers*



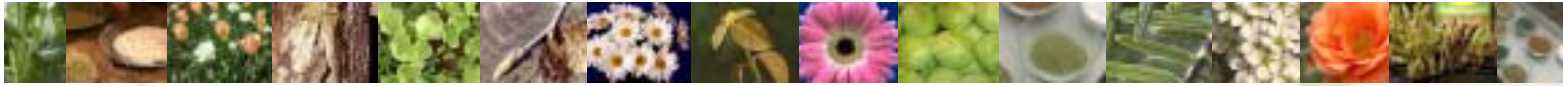


# rack- and shelf systems:

## *elements overview*



- *frame module*
- *basic shelf module*
- *lighting module*
- *shelf insulating module*
- *shelf cooling module*



# rack- and shelf systems:

## *elements overview*

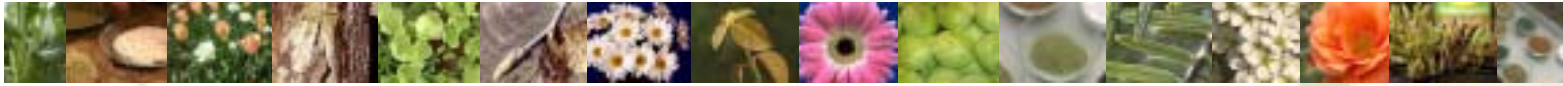


■ *shelf with air intake from below*

■ *shelf for temperature control*

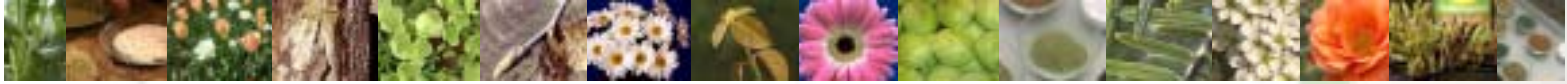
■ *air ventilation module*

■ *brine-tempering module*



## modular design: *main advantages*

- ✓ ***customised solutions, without costly project engineering***
- ✓ ***user-defined execution according customers facilities and application***
- ✓ ***available as movable or fixed design***
- ✓ ***various options***

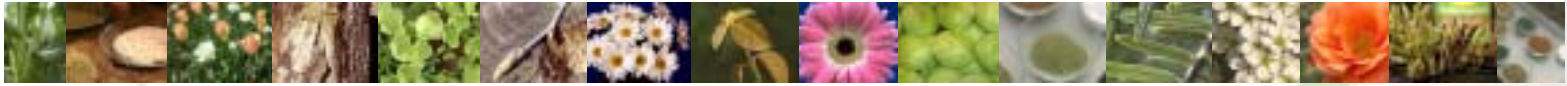


## modular design: *main advantages*

- ✓ *good price/ performance ratio*
- ✓ *simple and fast to install*
- ✓ *low installation costs*
- ✓ *reliable components, service friendly construction, short deliverable spare parts*



walk-in test chambers for biological research



**END**

- walk-in test chambers  
- for biological research -