

## Heat Insulation **With Clinkers.**

Instructions

**4** good reasons  
for insulating a  
facade with clinkers

- heat cost saving
- exclusive appearance
- increase in value
- simple assembly

UP TO  
**60%**  
HEAT COST  
SAVING

# Heat insulated facades with real clinker closers.

Professional quality can be achieved  
so fast, easily and inexpensive!

**Dämmklinker**<sup>®</sup>  
...mehr als nur Fassade.

## Lowered Heating Costs – Improved Quality of Life

Heat insulated facades reduce high heating costs drastically and improve the quality of life within your own four walls by generating an exceptionally comfortable room climate.

The Heat Insulating Clinker System is a particularly economic way of producing highly efficient heat insulating exterior walls. It is a durable protection for exterior walls under all weather conditions.

Heat energy waste through exterior walls may be reduced up to 60 per cent.

The following instruction shows how easily each step of work can be carried out, convince yourself.

UP TO  
**60%**  
HEAT COST  
SAVING

Without Dämmklinker.



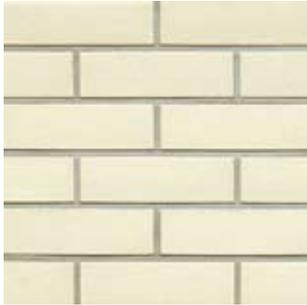
With Dämmklinker.





# A Great Variety of Different Clinkers.

A small selection of clinker closers available



**R 100**  
cream white nuances, smooth



**R 116**  
cream white nuances,  
hand mould grained, sanded



**R 200**  
yellow nuances, smooth



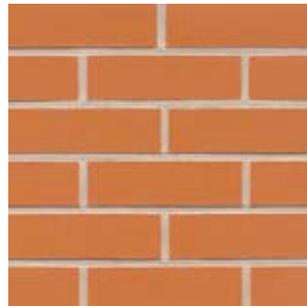
**R 209**  
yellow "Paris", yet-black



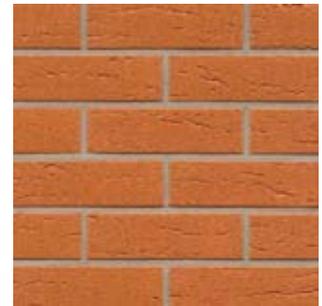
**R 215**  
bronze-varicoloured,  
hand mould grained, sanded



**R 216**  
yellow nuances,  
hand mould grained, sanded



**R 220**  
terracotta, smooth



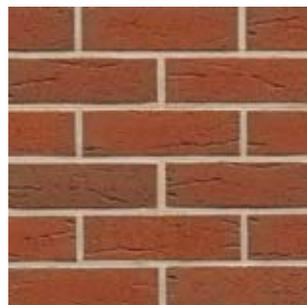
**R 227**  
terracotta, red-varicoloured  
variegated, "Formback"-structure



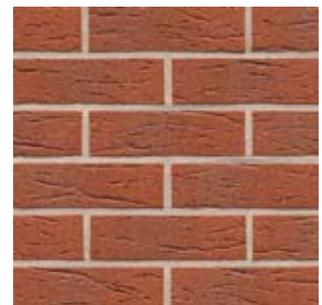
**R 228**  
terracotta, red-varicoloured  
variegated, yet-black



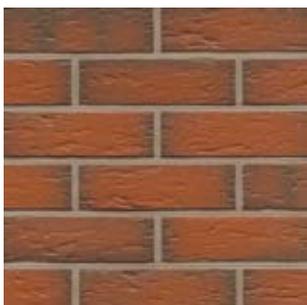
**R 287**  
yellow-varicoloured variegated,  
"Formback"-structure, aubergine



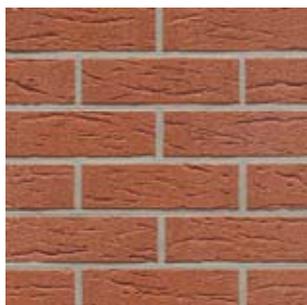
**R 307**  
red-varicoloured variegated,  
"Formback"-structure



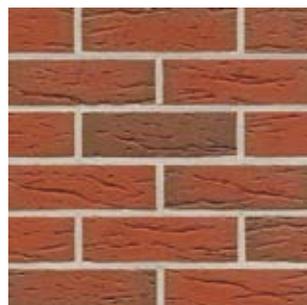
**R 335**  
antic-varicoloured variegated,  
hand mould grained, sanded



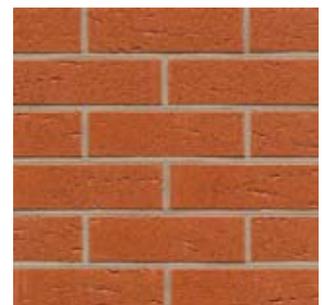
**R 343**  
red-varicoloured variegated,  
flat grained



**R 435**  
red nuances,  
hand mould grained, sanded



**R 436**  
red-varicoloured variegated,  
hand mould grained, sanded

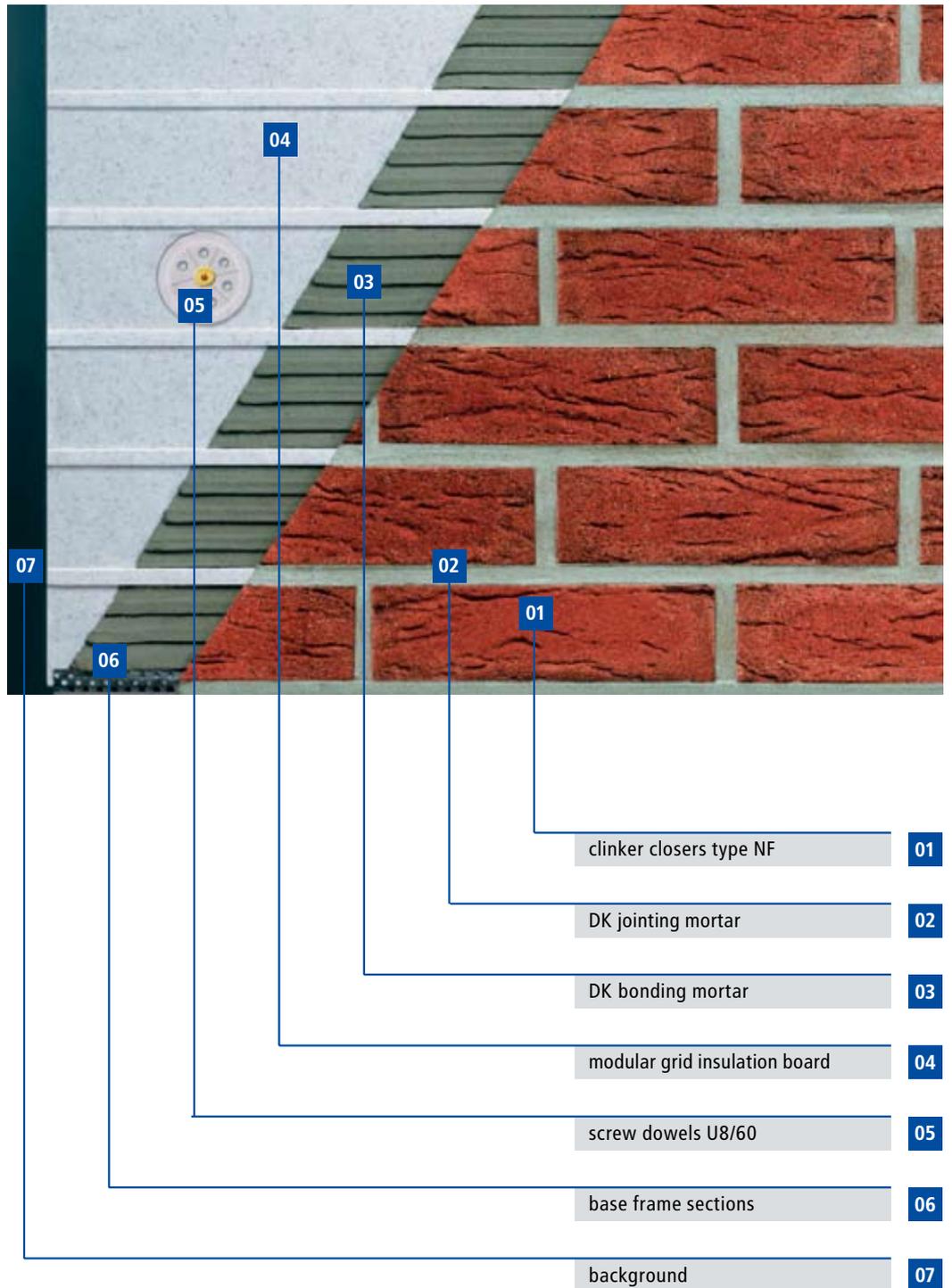


**R 487**  
red "Manchester",  
"Formback"-structure

# Modular Grid System for Clinker Facades.

## Insulating and Placing of Clinker in the Reconstruction Area

### System Structure



## Preparation – Tools Needed.



For carrying out the work simply, quickly and properly, please obtain the following tools:

- ▶ water level
- ▶ hand drilling machine and a stone drill
- ▶ cordless screw driver and a recess
- ▶ hand saw
- ▶ folding rule
- ▶ stainless steel tooth trowel and mason's trowel
- ▶ filling trowel
- ▶ 20l bucket for mixing



**Components of the Heat Insulating Clinker System - The heat insulating system consists of seven single components which are exactly matched to each other. The components are:**

- ▶ base frame sections
- ▶ DK bonding mortar
- ▶ modular grid insulation boards WLS 033
- ▶ screw dowels U8/60
- ▶ clinker closers type NF (type DF on request)
- ▶ angular clinker closers
- ▶ DK jointing mortar

# Stages of Work.



01

## Preparing the background

The background has to be free of adhesion reducing materials such as loose old plaster, remains of paint, dust, dirt and oily substances. Strongly absorbing and sandy backgrounds should be prepared with “Dämmklinker deep solvent primer LF” or with “Dämmklinker priming coat <One for All>”.



02

## Setting up the base frame sections

To ensure that the clinkers will be exactly lined up, the base frame sections have to be adjusted absolutely level. (Water level) For anchoring the base frame sections at the walls, place the first dowel in the outer long hole. The other dowels have to be set with a distance of 0.5 m between each other. (There are 6 dowels per base frame section.) In case of a severely uneven background, please use the washers provided in the “Dämmklinker base frame section fixing kit” for evening out the wall. Furthermore the fixing kit contains plug sockets which ensure the right distance between the sections and provide an expansion of the material without damages.



03

## Preparing the grid insulation boards

Before fixing the first row of grid insulation boards, the bottom of the boards has to be shortened with a hand saw or a hot wire (approx. 5 cm including the first land). Within the following rows, this work step is not necessary anymore. Please fix the grid insulation boards in a way, that there is no level difference between the boards and that the vertical joints are offset by at least 10 cm.



04

## Cementing the grid insulation boards

The bonding mortar has to be mixed according to the instructions on the back of the package. Then apply the mortar on the backside of the insulation board (as it is shown on the left picture). Position the prepared board on the base frame section and press it firmly against the wall.

**Important:** Remember to cement the following boards level and evenly. Avoid any offset of the boards' surfaces in order to enable a proper cementing of the clinker closers.



05

## Dowelling of the grid insulation boards (6 screw dowels per m<sup>2</sup>)

When the cement has dried (after 24 hours at +20 °C at the earliest), fix the insulation boards with screw dowels (on average at the middle and edge areas, 6 screw dowels per m<sup>2</sup> depending on the building height). Drill holes (diameter 8 mm) through the insulation boards into the background. Then place dowels in the drill holes and fix the screw tightly by using a cordless screw driver. Tight the screws in a way, that they are level with the plate surface of the dowel. To avoid any bulging of the insulation boards in the area of corners, increase the number of dowels.

**Important:** The anchoring depth in the bearing wall should be between 25 and 110 mm (depending on the type of stonework or wall material of the background).



06

## Applying the contact layer on the grid insulation boards

Apply “DK bonding mortar” with high pressure on the fitted insulation board. Then create a grooved bed by using a tooth trowel.

**Important:** Apply only as much mortar as clinker closers can be placed until the mortar has dried (depends on air humidity and object temperature).

# Stages of Work.

## Applying of bonding mortar on the clinker closer

Apply a thin layer of cement on the whole back of the clinker closer by using a mason's trowel. ("Buttering-Floating-method")

Bonding mortar, which gets onto the visible surface of the clinker closer during processing, **has to be "dabbed" away immediately with a moist sponge – do not rub!** Otherwise the bonding mortar will soak in and cannot be removed completely!

## Placing of clinker closers

Now press the clinker closer firmly in the prepared grooved cement bed. The further tiring should always be done according to the wall bond. If cement comes out at the sides during tiring, please remove it immediately. This preserves the moulded depth of the joint.

## Placing of angular clinker closers

The cementing and placing of the angular clinker closers is conducted as described in stage 8. At quoins and window corners the clinker closers have to be shortened to a length of about 17 cm. (This is only necessary if the clinker closers are placed in an irregular wall bond.)

**Important:** Always start placing of angular clinker closers from the corner area!

## Placing at window and door areas

The grid insulation boards have to be cemented and dowelled as described in stages 4 and 5.

**Important:** In the head areas of windows, window sills and doors the lands have to be removed. Concerning the cementing of the angular clinker closers please observe an equal distance between the joints.

**Note:** If the window reveal width is too narrow, this area can be insulated with thinner insulation boards (for example 30 or 40 mm). Not insulated window reveal areas can lead to a thermal bridge effect of up to 10 per cent (in relation to the total façade area).

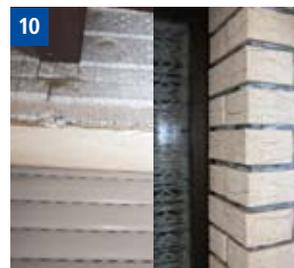
## Head

The head has to be done in a wall bond of one clinker closer alternating with a half closer (as it is shown on the picture). The head height is given by the modular dimension.

## Filling of joints

The filling of joints can be started after the complete drying (48 h at the earliest, depending on the outside temperature). Mix the "DK jointing mortar" according to the instructions on the package.

**Recommendation:** Mix the jointing mortar to a slightly moist and plastic consistence. Fill each joint by using a filling trowel. Make sure that the whole depth of the joint is filled. After the joint filling is set, small amounts of mortar can be reapplied if necessary. When the filling is completed, the façade should be brushed step by step diagonally to the joints with a clean hand brush.



# The Insulating Effect.

Building material of the wall	bulk density class [kg/dm <sup>3</sup> ]	thermal cond. coefficient [W/m <sup>2</sup> K]	wall thickness [cm]	U-value* of the wall [W/m <sup>2</sup> K]	U-value with insulation board**		
					60MM	80MM	100MM
normal concrete DIN 1045	2,4	2,1	24	3,52	-	-	0,30
KS-R(P) concrete precision block DIN 106	2,2	1,3	15	3,50	-	-	0,30
KS-R(P) concrete precision block DIN 106	2,0	1,1	15	3,26	-	-	0,30
KS-R(P) concrete precision block DIN 106	2,0	0,99	15	3,11	-	-	0,30
KS-R(P) concrete precision block DIN 106	2,0	1,1	17,5	3,04	-	-	0,30
KS-R(P) concrete precision block DIN 106	1,8	0,99	17,5	2,88	-	-	0,30
KS-R(P) concrete precision block DIN 106	2,0	1,1	20	2,84	-	-	0,30
KS-R(P) concrete precision block DIN 106	1,8	0,99	20	2,69	-	-	0,30
KS-R(P) concrete precision block DIN 106	2,0	1,1	24	2,58	-	-	0,29
KS-R(P) concrete precision block DIN 106	1,8	0,99	24	2,42	-	-	0,29
solid brick / vertically perforated brick	2,0	0,96	24	2,38	-	-	0,29
KS-R(P) concrete precision block DIN 106	1,4	0,7	17,5	2,38	-	-	0,29
solid block / brick (Vbl) LB, DIN 18152	1,8	0,87	24	2,24	-	-	0,28
granulated slag brick DIN 398	2,0	0,76	24	2,06	-	-	0,28
full block / full brick (V) LB DIN 18152	1,6	0,74	24	2,02	-	-	0,28
KS-R(P) concrete precision block DIN 106	1,4	0,7	24	1,95	-	-	0,28
solid brick (old houses)	2,0	1,05	38	1,88	-	-	0,28
hollow block / ganged brick LB DIN 18151	1,0	0,64	24	1,83	-	-	0,28
solid brick / vertically perforated brick	1,2	0,5	24	1,54	-	-	0,27
granulated slag brick DIN 398	1,0	0,47	24	1,47	-	-	0,27
LHiz, A+B, DIN 105/2	0,8	0,39	24	1,27	-	-	0,26
solid block / brick (Vbl) LB, DIN 18152	0,8	0,39	24	1,27	-	-	0,26
full block / full brick (V) LB DIN 18152	0,5	0,32	24	1,09	-	0,30	0,25
LHiz, A+B, DIN 105/2	0,7	0,3	24	1,03	-	0,29	0,25
hollow block / ganged brick LB DIN 18151	0,5	0,29	24	1,00	-	0,29	0,25
foam mortar DIN 4065	0,8	0,29	24	1,00	-	0,29	0,25
foam mortar DIN 4065	0,5	0,22	24	0,79	-	0,27	0,23
LHiz T after authorization	0,8	0,21	30	0,63	0,28	0,25	0,22
LHiz T18 after authorization	0,8	0,18	36,5	0,46	0,24	0,22	0,19

  U-value of an old house < 0.30 [W/m<sup>2</sup>K] according to EnEV 2006  
Rule-of-thumb:

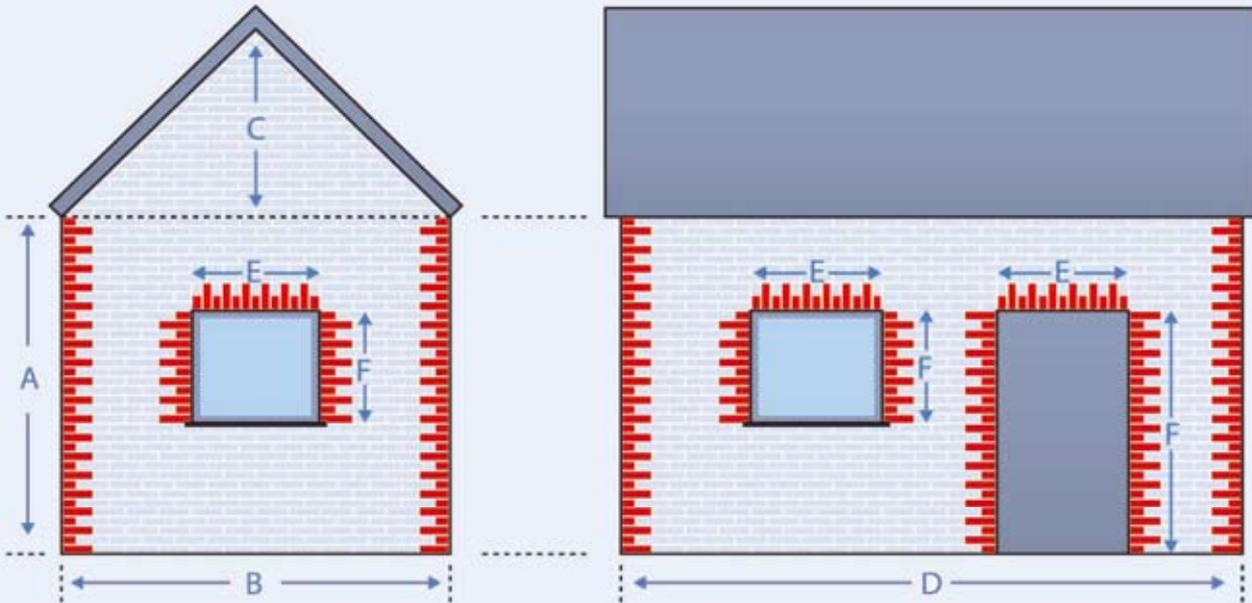
U-value x 10 = fuel oil in liters per m<sup>2</sup> heated area and heating period  
U-value x 10 x 3 =CO<sup>2</sup> emission in kg per m<sup>2</sup> heated area and heating period

\* U-value: describes the amount of heat (in kWh) which is transmitted through a part of the building surface of 100m<sup>2</sup> when there is a temperature difference of 10 °C between the interior and the exterior.  
The smaller the U-value, the smaller the heat energy loss - that means a good heat insulation.  
The placed clinker closers were not taken into account in this calculation.  
\*\* further insulation board sizes on demand



# Calculation Assistance

**Model House**  
(rectangular ground plan – no bays, twisting areas, etc.)



### Step 1:

Calculation of the wall facade area – including the front and rear sides

$A \times B \times 2$ : \_\_\_\_\_ = \_\_\_\_\_

$B \times 1/2C \times 2$ : \_\_\_\_\_ = \_\_\_\_\_

$A \times D \times 2$ : \_\_\_\_\_ = \_\_\_\_\_

total: \_\_\_\_\_

subtraction of the sum of all window and door areas

(per each window and door:  $E \times F$ ): - \_\_\_\_\_

Total facade wall area (m<sup>2</sup>):

### Step 2:

Calculation of the frame section length

$(B + D) \times 2$ : \_\_\_\_\_ = \_\_\_\_\_

subtraction of door width - \_\_\_\_\_

total frame section length (m)

### Step 3:

Calculation of the corner length

Amount of house corners

$A \times 4$ : \_\_\_\_\_ = \_\_\_\_\_

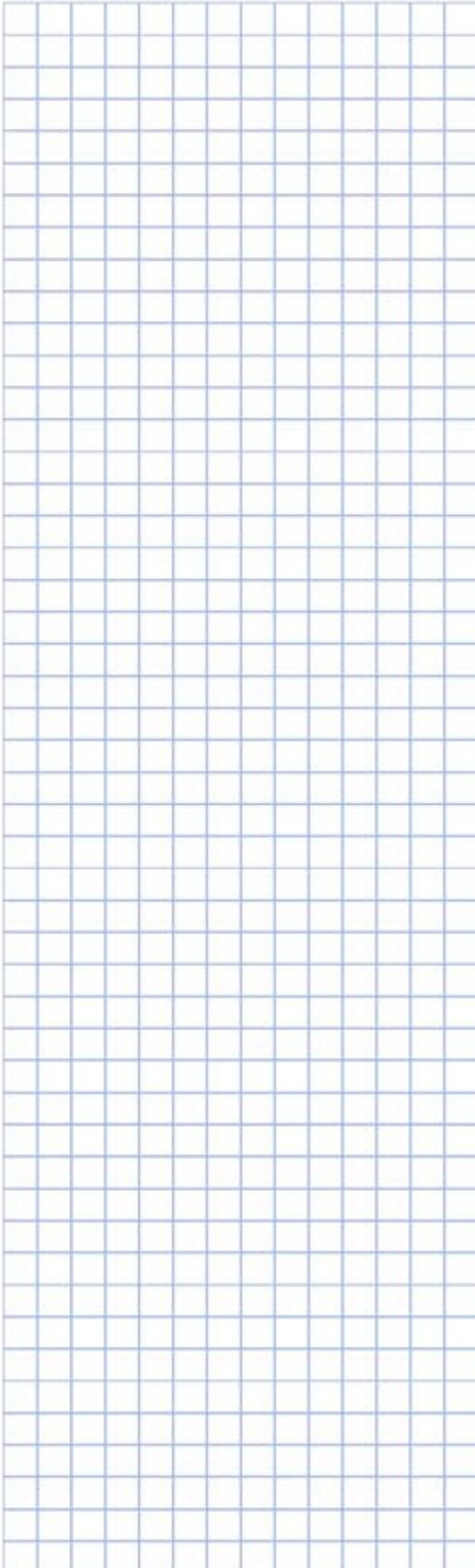
Addition of the total of all window and door lengths:

(per each window and door:  $E + 2 \times F$ ) + \_\_\_\_\_

total corner length (m)

Please use the values calculated above for the determination of the material demand on the next page.

# Material Demand Calculation.



## Model calculation - it's really easy!

- 1. Base frame section (length: 2.5m)**
  - ▶ Calculation of the house's base frame length (see page 9)  
Example: base frame length = 40m
  - ▶ Consumption:  $40\text{m} / 2.5\text{m base frame} = 16$  base frame sections
- 2. Base frame mounting kit**  
(1 box is sufficient for 25 running meters)
  - ▶ Calculation of demand according to the base frame length of the house
  - ▶ Consumption:  $40\text{m} : 25\text{m} / \text{mounting kit} = 2$  mounting kits
- 3. DK bonding mortar (consumption: approx. 8.0 kg/m<sup>2</sup>)**  
mounting of insulation boards: approx. 5.0 kg/m<sup>2</sup>; placing of clinker closers: approx 3.0 kg/m<sup>2</sup>. Old houses and uneven surfaces require a higher amount of mortar.
  - ▶ Calculation of the total facade area  
Deduction of window and door reveals (see page 9)  
Example:  $125\text{ m}^2$  (total) -  $25\text{ m}^2 = 100\text{ m}^2$  outdoor area
  - ▶ Consumption:  $100\text{m}^2 \times 8.0\text{ kg/m}^2 = 800\text{ kg}$   
 $800\text{ kg} : 25\text{ kg/unit} = 32$  units "DK bonding mortar"
- 4. Grid insulation board**  
The demand of insulation boards has to be calculated with about 3 – 5 per cent cutting loss
  - ▶ 5% cutting loss has to be added to wall facade area
  - ▶ Example:  $100\text{ m}^2 + 5\% = 105\text{ m}^2$
- 5. Screw dowels U8/60 (consumption 6 dowels per m<sup>2</sup>)**  
The additional demand for corner areas is not included.
  - ▶ Wall facade area is to be multiplied with the consumption
  - ▶ Example:  $100\text{ m}^2 \times 6\text{ Pcs./m}^2 = 600$  screw dowels
- 6. Clinker closers type NF (consumption: 48 closers per m<sup>2</sup>)**
  - ▶ Wall facade is to be multiplied with the consumption
  - ▶ Example:  $100\text{m}^2 \times 48\text{ Pcs./m}^2 = 4800$  clinker closers
- 7. Angular clinker closers (consumption: 12 closers per running meter)**
  - ▶ The total length of all quoins, door and window corners has to be calculated. This result has to be multiplied with the consumption.  
Example:  $12\text{ m}$  (quoins) +  $30\text{ m}$  (Ex.: 5 Windows, one door = 42 m)
  - ▶ Consumption:  $42\text{ m} \times 12\text{ Pcs./m} = 504$  angular clinker closers
- 8. DK joint mortar (consumption: approx. 6.0 kg/m<sup>2</sup>)**
  - ▶ Outer wall area is to be multiplied with the consumption  
Example:  $100\text{ m}^2 \times 6.0\text{ kg/m}^2 = 600\text{ kg}$
  - ▶ Consumption:  $600\text{ kg} : 25\text{ kg/unit} = 24$  units DK joint mortar
- 9. DK silicone resin preserver**  
5 l of concentrate (ratio 1:9) = 50l applicable emulsion
  - ▶ Consumption on flat grained clinker closers approx. 0.2l per m<sup>2</sup>  
Consumption on grained sanded clinker closers approx. 0.3l per m<sup>2</sup>
  - ▶ The outer wall area has to be multiplied with the consumption.  
Example (flat grained clinker closers):  $100\text{ m}^2 \times 0.2\text{ l/m}^2 = 20\text{ l}$
  - ▶ Consumption: 1 canister of concentrate



# Comparison

Without Dämmklinker



With Dämmklinker





***Klinker-Zentrale***®

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