

# Design

## Range of application

WEM Radiant Wall Heating Systems are suitable for new construction and refurbishment and well as for timber and solid construction. They satisfy the requirements on exclusive sources of heating, but you can also use them in combination with other radiating heating or conventional radiator systems. Radiant wall heating systems are also appropriate for cooling. You can fit Climate Panels to walls, roof pitches or the ceiling.

## Thermal protection

The structures of exterior walls in new and old buildings must comply with the requirements of the German Energy Saving Ordinance EnEV in its currently applicable version. For existing buildings, subsequent interior or exterior thermal insulation might be required. For interior insulation, we recommend materials that are capillary active and permeable to vapour diffusion. A certificate of building physical testing should be available for these materials. We will be pleased to give advice to interested designers.

There are no requirements concerning the thermal insulation of interior walls, you should however consider the risk of uncontrolled heat transmission to unheated spaces and avoid it.

The German Energy Saving Ordinance EnEV requires a limitation of the heat emission of manifold pipes. This requirement should be observed under all conditions. The following excerpts taken from the Ordinance apply to WEM Radiant Wall Heating Systems:

| Row | Type of pipe   | Minimum insulation thickness<br>(at $\lambda=0.04$ W/mK) | Minimum insulation requirement |
|-----|--|--|--------------------------------|
| 1   | Pipes through unheated rooms   | 26 mm  | 100 %                          |
| 5   | Pipes in wall and ceiling penetrations, in pipe crossing areas, at pipe connection points, on central pipe manifolds | 13 mm  | 50 %                           |
| 6   | Pipes that are laid in structural components separating heated spaces of different occupants                         | 13 mm  | 50 %                           |
| 7   | Pipes in flooring structures / with impact protection  | 4 mm   |                                |

*Note: For other insulating material qualities ( $\lambda$  unequal to 0.04 W/mK), convert the values accordingly.*

**Sound insulation, fire protection**

The entire wall structure must comply with the requirements concerning sound proofing and fire protection. Under normal conditions, the heating system designer and the architect take care of these requirements in the design.

The WEM Climate Panels and Clay Panels coated with WEM Clay Fine Finish Plaster have been tested as per DIN EN 13501-1 and comply with fire performance class A2 (not flammable).

In cooperation with the University of Koblenz, the sound-proofing properties of the WEM products have been examined. The results are specified in the respective technical product information.

**Dimensioning, quantity survey**

The calculation of the required quantities for the wall heating to be installed is based on the calculation of the standard thermal load as per DIN EN 12831. These guidance values are used for the dimensioning and design of the heating system in each room in accordance with the requirements of the subsequent occupation.

If a heating load calculation as per DIN EN 12831 is not available, WEM Wandheizung GmbH will render this service subject to a fee. Alternatively, we can provide an estimate of the heating loads in your construction project based on our long-term experience. This service is free of charge.


To request a calculation, call us at +49 261 9833990 or send an e-mail to [wem@wall-heating.com](mailto:wem@wall-heating.com).

**Kunde:**

Name: Musterfamilie  
 Adresse: Stadtzentral  
 Ort: Musterstadt  
 Tel: \_\_\_\_\_  
 eMail: [wem@wandheizung.de](mailto:wem@wandheizung.de)

**Bauvorhaben:**

Name: Musterfamilie  
 Adresse: Stadtzentral  
 Ort: Musterstadt  
 Tel: \_\_\_\_\_  
 eMail: \_\_\_\_\_



**Wandheizfläche:**  
 Die angegebenen Heizleistungen gelten für die WEM Wandheizungssysteme in Verbindung mit den WEM Lehmputzen bzw. Kalkputzen und sind nicht auf andere Produkte übertragbar.

**Wandheizfläche:**  
 WEM Putzsysteme (wählbar durch anklicken)  
 Vorlauftemperatur (wählbar durch anklicken)  
 Wärmeleistung der Heizfläche

|               |                                       |
|---------------|---------------------------------------|
| Lehm          | WEM Universalsputz oder Naturkalkputz |
| 45            | °C                                    |
| Klimaelement  | 170 W/m <sup>2</sup>                  |
| Klimaregister | 200 W/m <sup>2</sup>                  |
| Klimarohr     | 20 W/m                                |

Voraussetzungen: Altbau gedämmt

| Erdgeschoss |               | Trochsenbau: Klimaelement |                            |                     |                 |                 | Nasssystem: Klimaregister oder / und Rohrsystem |           |                     |   |   | Wandheizfläche in m <sup>2</sup> | Heizleistung in W | Differenz Leistung/Bed. in W | Heizkreise |      |
|-------------|---------------|---------------------------|----------------------------|---------------------|-----------------|-----------------|---|-----------|---------------------|---|---|----------------------------------|-------------------|------------------------------|------------|------|
|             |               | KE 200 in Stück           | KE 180 in Stück            | KE 80 in Stück      | KR 200 in Stück | KR 180 in Stück | KR 80 in Stück                                  | Rohr in m | Zahnbohlen in Stück |   |   |                                  |                   |                              |            |      |
| Pos.        | Raum          | Raumgröße m <sup>2</sup>  | Heizlast je m <sup>2</sup> | Wärmebedarf in Watt |                 |                 |   |           |                     |   |   |                                  |                   |                              |            |      |
| 2.1         | Küche / Essen | 23,0                      | 63                         | 1449                |                 |                 |   | 5         | 1                   |   |   | 0                                | 7,3               | 1.450                        | OK         | 1    |
| 2.2         | Bad           | 8,5                       | 85                         | 723                 |                 |                 |   | 3         |                     |   |   | 0                                | 3,8               | 750                          | OK         | 1    |
| 2.3         | Wohnen        | 22,0                      | 48                         | 960                 |                 |                 |   | 4         |                     |   |   | 0                                | 5,0               | 1.000                        | OK         | 1    |
| 2.4         | Schlafzimmer  | 18,5                      | 60                         | 1110                |                 |                 |   | 2         | 3                   |   |   | 0                                | 5,5               | 1.100                        | OK         | 1    |
|             | Summe         | 72,0                      |                            | 4272                | 0               | 0               | 0   | 14        | 4                   | 0 | 0 | 0,0                              | 21,5              | 4.300                        |            | 29 4 |

| I. Obergeschoss |              | Trochsenbau: Klimaelement |                            |                     |                 |                 | Nasssystem: Klimaregister oder / und Rohrsystem |           |                     |   |   | Wandheizfläche in m <sup>2</sup> | Heizleistung in W | Differenz Leistung/Bed. in W | Heizkreise |      |
|-----------------|--------------|---------------------------|----------------------------|---------------------|-----------------|-----------------|---|-----------|---------------------|---|---|----------------------------------|-------------------|------------------------------|------------|------|
|                 |              | KE 200 in Stück           | KE 180 in Stück            | KE 80 in Stück      | KR 200 in Stück | KR 180 in Stück | KR 80 in Stück                                  | Rohr in m | Zahnbohlen in Stück |   |   |                                  |                   |                              |            |      |
| Pos.            | Raum         | Raumgröße m <sup>2</sup>  | Heizlast je m <sup>2</sup> | Wärmebedarf in Watt |                 |                 |   |           |                     |   |   |                                  |                   |                              |            |      |
| 3.1             | Kind 1       | 22,5                      | 45                         | 1058                |                 |                 |   | 3         | 1                   | 1 |   | 0                                | 5,2               | 1.050                        | OK         | 1    |
| 3.2             | Bad          | 6,5                       | 75                         | 488                 |                 |                 |   | 2         |                     |   |   | 0                                | 2,5               | 500                          | OK         | 1    |
| 3.3             | Kind 2       | 22,0                      | 40                         | 880                 |                 |                 |   | 2         | 2                   |   |   | 0                                | 4,5               | 900                          | OK         | 1    |
| 3.4             | Schlafzimmer | 19,0                      | 38                         | 722                 |                 |                 |   | 3         |                     |   |   | 0                                | 3,8               | 750                          | OK         | 1    |
|                 | Summe        | 71,0                      |                            | 3147                | 0               | 0               | 0   | 10        | 3                   | 1 | 0 | 0,0                              | 16,0              | 3.200                        |            | 53 4 |

| Gesamt |        | Wärmebedarf in Watt | KE 200 in Stück | KE 180 in Stück | KE 80 in Stück | KR 200 in Stück | KR 180 in Stück | KR 80 in Stück | Rohr in m | Zahnbohlen in Stück | Wandheizfläche in m <sup>2</sup> | Heizleistung in W | Differenz Leistung/Bed. in W | Heizkreise |
|--------|--------|---------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|-----------|---------------------|----------------------------------|-------------------|------------------------------|------------|
|        | 143,00 | 7419                | 0               | 0               | 0              | 24              | 7               | 1              | 0         | 0,0                 | 37,5                             | 7500              | 83                           | 8          |

**Design temperatures**

We recommend designing the system for a maximum temperature of 45 °C in the supply flow. Depending on the energetic characteristics of the heat generator (heat pump), another design temperature, e.g. 35 °C for heat pumps, might be more reasonable.

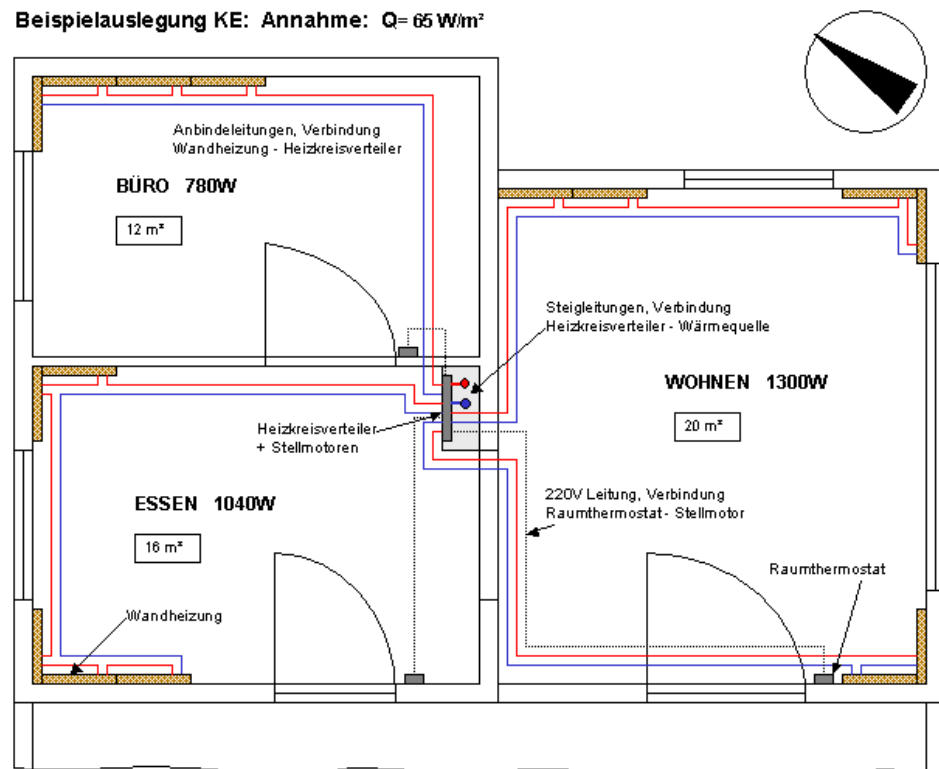
Where radiant ceiling heating systems are concerned, supply temperatures of max. 35 °C should be considered if the clear room height does not exceed 2.7 m.

**Place of installation**

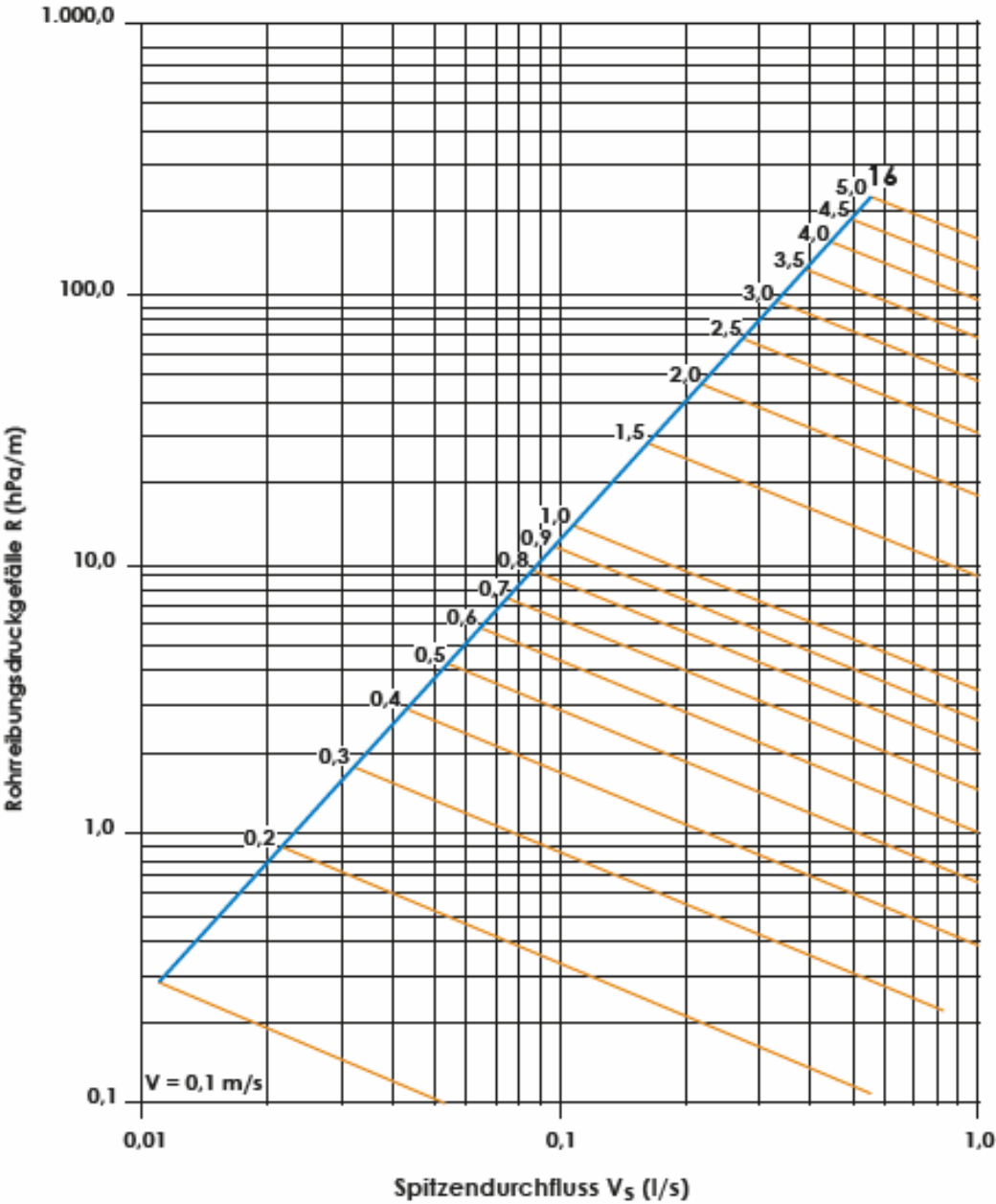
WEM Wall Heating Systems are preferably installed on the inner surface of exterior walls to prevent heat loss of the human body by radiation to the potentially cold surfaces. This ensures a high level of comfort.

The location of the WEM Wall Heating panels on the wall surfaces shall provide for comfort zones, i.e. they are fitted in dining recesses, in areas with seat groups, near desks or in relax areas.

Beispielauslegung KE: Annahme:  $Q = 65 \text{ W/m}^2$

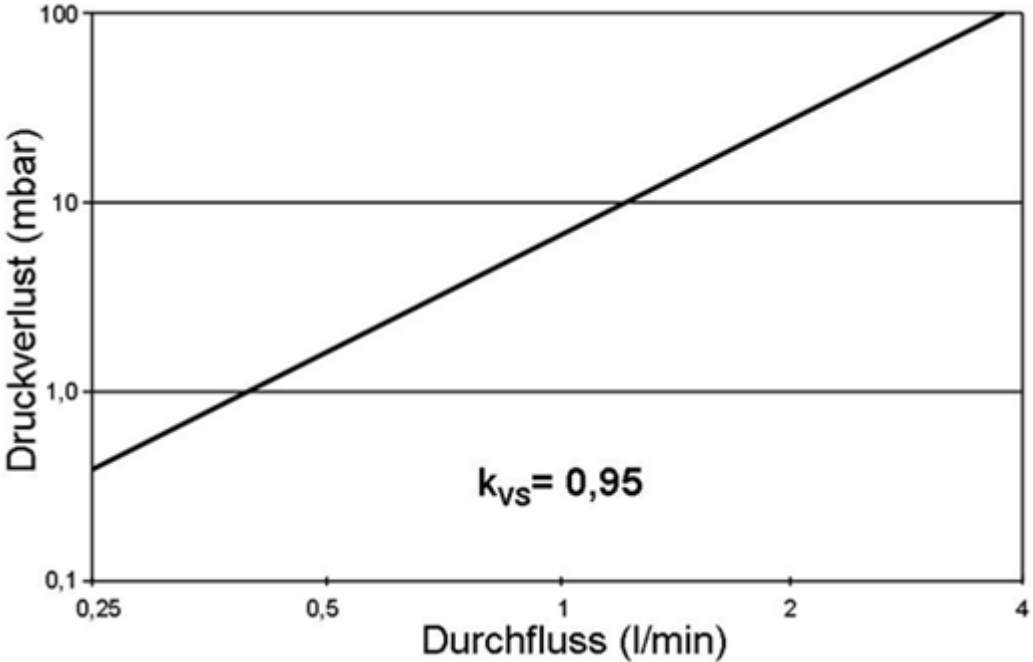


**Pressure loss**      **WEM Composite Metal Pipe**



| WEM Press-Fit Fittings  | Zeta value $\zeta$ | Equivalent pipe length |
|---|--------------------|------------------------|
| WEM Press-fit Coupler $\varnothing 16$ mm   | 1.70               | 0.8 m                  |
| WEM Press-fit Elbow $\varnothing 16$ mm   | 4.4                | 2.0 m                  |
| WEM Press-fit Junction R $\frac{1}{2}$ " NT, $\varnothing 16$ mm                                  | 1.70               | 0.8 m                  |
| WEM Press-fit Junction R $\frac{1}{2}$ " FT, $\varnothing 16$ mm                                  | 1.70               | 0.8 m                  |
| WEM Press-fit Screw Fitting (Euro cone) with spigot nut R $\frac{3}{4}$ " FT, $\varnothing 16$ mm | 1.70               | 0.8 m                  |

**WEM Heating Manifold**



**Multibox K and K-RTL**

