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RENOVATION OF BUILDINGS USING STEEL TECHNOLOGIES (ROBUST)

RFSR CT 2007-0043

**WP2: Renovating industrial buildings: Energy efficiency strategies
- Detailed analysis of improved thermal insulation -**

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Detailed analysis of improved thermal insulation

The IR-surveys of the industrial buildings in light-weight steel construction as shown before make it clear, that the cassette-walls are weak concerning the thermal performance. Tests in the hot-box proof this conclusion (Figure 1.1).



Figure 1.1 Existing state of cassette wall (left), IR-survey cassette wall in Hot-Box (right)

Thus, new solutions for improving the thermal quality are needed. Two options are considered in this subtask (Figure 1.2):

- a) Re-cladding using an additional insulation,
- b) Overcladding using steel-sandwich-elements.



Figure 1.2 Re-cladding with additional insulation layer (Rockwool: “Steelrock”, left), overcladding using steel sandwich elements (right)

The solution Re-cladding with additional insulation was studied in detail by FEM-calculations and tests in the Hot-Box, investigations concerning overcladding using steel sandwich elements are still in development.

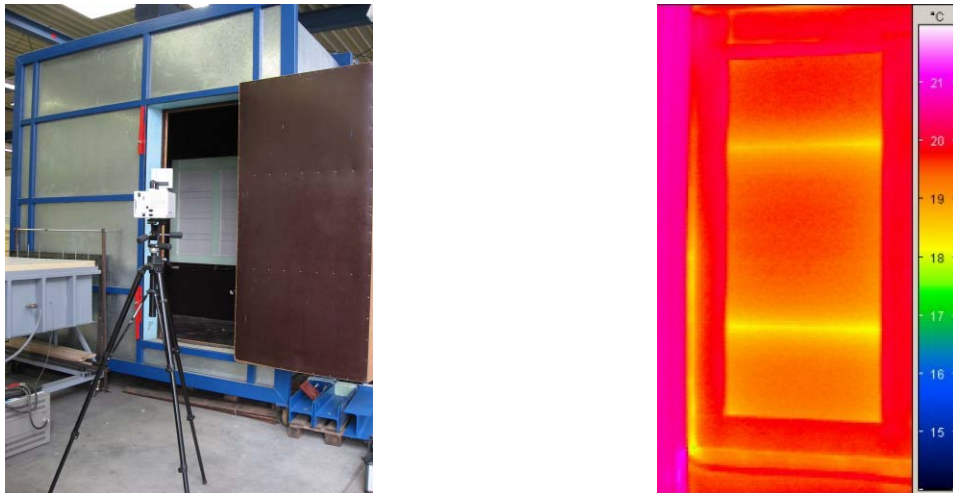


Figure 1.3 Hot-box with infrared-camera (left), result for re-cladded cassette wall (right, compare with Figure 1.1!)

Figure 1.3 shows the significant effect of this solution, the impact on the U-Value gives Figure 1.4. The effect of thin additional layers (5 or 10 mm) is obviously too small, a thickness of 40 mm can be recommended, thus a U-value of about 0.4 W/m²K can be reached.

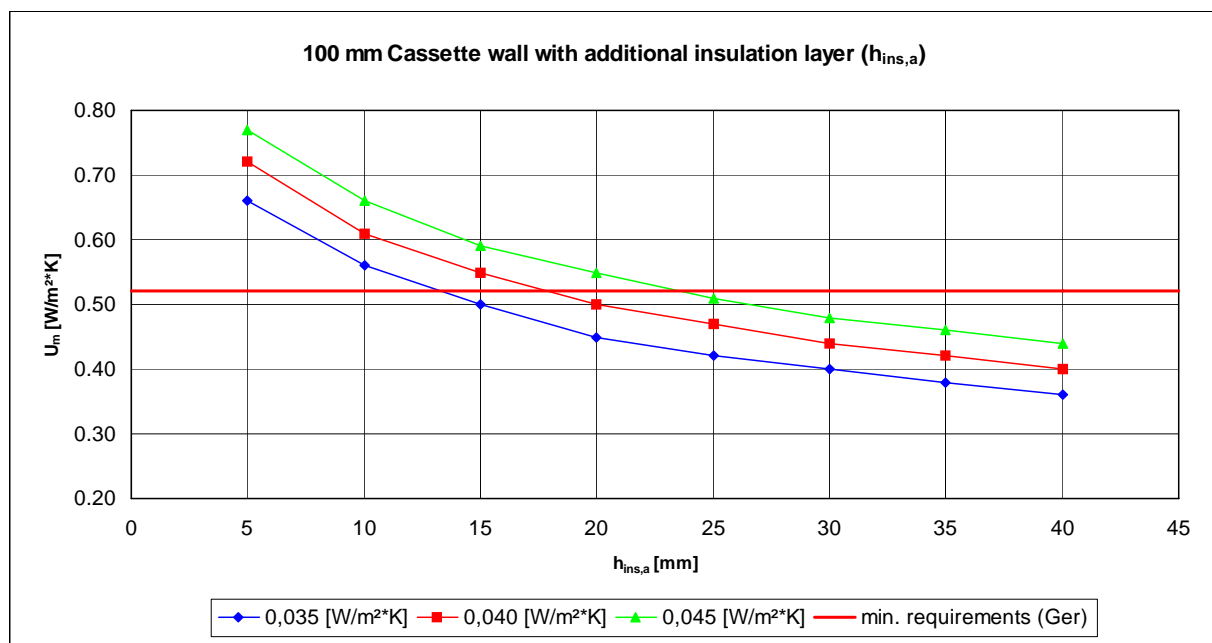


Figure 1.4 Impact of additional insulation layer on cassette wall (100 mm)