

New facades for sustainable renovated buildings

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1 Abstract

In terms of rehabilitation of existing buildings, a new façade is often planned and build to make the building more sustainable. In more and more cases, not only new windows, but also completely new façades and even so-called double skin facades are being constructed. This second skin has several advantages like sound protection, possibility of natural ventilation, contribution to energy balance and others. The paper will give basic requirements and information about this type of facade. One recently realized project is a high rise building of more than 100m height in Munich, listed as a historic building – so additional attention to optical appearance was necessary. And moreover, curved insolation glass units had to be used; since there are no regulations, special theoretical investigations and calculations had to be carried out.

Keywords: Glass; double skin façade, insolation glass; rehabilitation; high-rise buildings

2 Introduction

Rising energy costs and amendments to regulations have strengthened the society's awareness of energy saving measures. In order to reduce CO2 emissions many buildings dating from the 1960s and 1970s are being now refurbished. They scarcely comply with the stricter building standards introduced in recent years and very often need to be renovated not only in terms of energy efficiency but also in terms of fire protection and functionality. Retrofitting existing buildings is very often even more complex than designing new ones as the remaining structure has to be included in the design concept and compromises have to be made in many cases to meet standards and requirements.

To reduce the expansion of SBS (sick building syndrome) also living and working conditions have to be improved.

As a smart construction element for solving these questions, an additional facade is placed with a certain distance in front of the inner facade.

To allow transmission of light and solar energy glass is used as a material for the second facade. Natural ventilation is possible when there is enough free space between the glass panes and if an optimized ventilation concept exists. Two examples for a double-skin facade at retrofitted buildings are shown in Fig. 1 and Figure 2.