

Project report

Muntin bars for the Leipzig Opera House

Gold-coloured Thermix® products from Ensinger help ensure refurbishment of GDR's historical first theatre in keeping with heritage requirements

1000 years of Leipzig: Formerly known as the "City of Lime Trees", Leipzig is pulling out all the stops to mark its jubilee in 2015. As a landmark trade fair, university and media city, Leipzig also aims to show off its musical credentials. Celebrated composers such as Johann Sebastian Bach, Felix Mendelssohn-Bartholdy, Richard Wagner, Gustav Mahler as well as Robert and Clara Schumann all worked here. And the world-famous Leipzig Gewandhaus Orchestra has a regular stage on which to perform in Europe's third oldest Opera House.

1960 saw the opening of the present-day Opera House, then the GDR's most modern theatre located on Karl-Marx-Platz, now renamed Augustusplatz. Its architecture evokes the classical predecessor building, which was destroyed by aircraft bombs in 1943. At the same time, with its austere language of form, this is heralded as one of the most attractive examples of the building style of the late 1950s. 737 large muntin windows with gold anodized aluminium frames lend a light and almost transparent appearance to the sandstone façade.

2700 square metres of muntin windows

"The problems besetting the building were so extensive that in 1998 it was still under threat of closure. But the City Council then voted in favour of refurbishment", explains Volker Längrich, Construction Supervisor and Head of Building Management at the Leipzig Opera House. "Since then, further renovation and refurbishment work has been carried out in the building during each summer interval: Structural faults have been eradicated, the building technology and fire safety equipment has been modernized and the interior fittings of the auditorium have been renovated in keeping with the original. Another task was

August 12, 2014

Ensinger at the fair

Glasstec 2014

October 21-24, 2014
Düsseldorf, Germany
Hall 15, stand G21

BAU

January 19-24, 2015
Munich, Germany
Hall B1, stand 430

replacement of the muntin windows over a surface area of 2,700 square metres.”

Many of the over 50 year-old windows were no longer functional and were letting in draughts. The heat transfer coefficient U_w was just 3.7 W/m²K. The result was low temperatures in winter, while in summer the building overheated, and the sound proofing was insufficient. Renewal of the windows in keeping with heritage guidelines and in accordance with the Energy Saving Act (EnEV) allows the achievement of a U_w value of 1.3 W/m²K, resulting in an estimated 15 to 20 per cent reduction in heating costs, restoring the future viability of the Opera House.

Thermix® minimizes thermal bridges

“Operatic artists are like high-performance athletes - so we had to pay attention to the humidity in the building”, explains Dipl.-Ing. Toralf Schmidt, in charge of renovation planning. “But because of the building’s listed status restrictions, we were not allowed to install tilting windows, even in the showers and changing rooms. Now, when required a 5 mm wide joint gap permits ventilation to take place between the window sashes. To prevent condensation build-up at the windows, the thermal bridges in the frame assembly had to be kept as minimal as possible.

The window construction company commissioned for the project, HAGA Metallbau, suggested using Thermix® muntin bars and warm edge spacers Thermix® TX.N® plus from Ensinger between the panes of the triple glazing. The plastic used for this is 700 times less thermally conductive than aluminium, which is used as the basis of conventional spacers. This allowed insulation of the frame assembly to be radically improved. The U_w value of the windows now even exceeds the requirements of EnEV, at 1.1 W/m²K.

New gold-framed windows to mark the jubilee

“Because they permit adjustment of the colour, the Thermix® muntin bars and spacers can be ideally used for heritage window renovation projects. A gold anodized aluminium panel on the pane creates the perfect visual impression”, says Mathias Riecke, CEO of HAGA Metallbau in Lichtenau. “Once we had agreed the design with our partners Sachsenglas Chemnitz, Wicona and Ensinger, we were able to complete production and installation of the 340 windows ranging in size from 1.4 times 1.6 to 2.4 metres within just eight weeks.”

“The customer was delighted with the muntin bars and spacers produced specially in a gold colour”, recalls Dr. Albert Lingens, Head of Thermix® Sales at Ensinger in Ravensburg. The last stage of the refurbishment project has been announced for 2014: 130 windows are due to be replaced in line with heritage guidelines during the summer interval, and once again these will be equipped with Thermix® products. The Leipzig Opera House will be resplendent in time for the city’s 1000 year celebrations following its complete structural and energy-efficient makeover with new gold-framed muntin windows.

4803 characters (including spaces)

Project details:

Renovation of Leipzig Opera House

Europe’s third public opera house was constructed in Leipzig in 1693. Looking back on a rich cultural tradition, this establishment remains highly successful to this day as a venue for opera, the Leipzig Ballet and Musical Comedy: audiences totalling around 170,000 attended the Leipzig performances in 2013, equal to 71 per cent capacity. Capacity increased in the case of opera performances from 51 to 73.8 per cent. The building constructed in 1960 has been undergoing renovation gradually since 1998. The windows of the east and west façade of the stage building were renovated in 2013.

Project scope:	340 windows of 2.8 sq.m.
Improvement:	U _w value from 3.7 W/m ² K to 1.1 W/m ² K (required by EnEV 1.3 W/m ² K)
Client:	Oper Leipzig, Leipzig, Germany
Planner:	Dipl.-Ing. Toralf Schmidt, Engineering Consultancy for Building Conservation, Leipzig, Germany
Window builder:	HAGA Metallbau GmbH, Lichtenau, Germany
Window profiles:	Wicona Verkaufsbüro Nord-Ost, Leipzig, Germany
Muntin bars:	Thermix® muntin bars from Ensinger, Ravensburg, Germany
Spacers:	Thermix® TX.N® plus warm edge spacers from Ensinger, Ravensburg, Germany
Insulated glass units:	Sachsenglas Chemnitz GmbH, Chemnitz, Germany
Installation:	Rainer Model Montagebau, Pöhl, Germany

1281 characters (incl. spaces)

For more information on Thermix[®] muntin bars:

<http://www.thermix.de/en/product-range/thermixr-muntin-bars.html>

For more information on Thermix[®] TX.N[®] plus spacers:

<http://www.thermix.de/en/thermixr/this-is-warm-edge.html>

Photos:



The Leipzig Opera House – built in 1960 as the GDR's first theatre – refurbished and resplendent for the city's 1000 year jubilee. Picture courtesy of: Kirsten Nijhoff, Oper Leipzig, Germany



The building has been under gradual renovation in every summer interval since 1998. In 2013 the windows in the east and west façade of the stage building were replaced. Picture courtesy of: Toralf Schmidt, Engineering Consultancy for Building Conservation, Leipzig, Germany



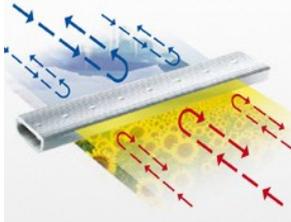
Production and installation of 340 windows ranging in size from 1.4 times 1.6 to 2.4 metres were completed in just eight weeks. Picture courtesy of: Mathias Riecke, HAGA Metallbau, Lichtenau, Germany



To comply with heritage requirements, no tilting windows were permitted even in the showers and changing rooms. Where required, a 5 mm joint gap between the window sashes is available to permit ventilation. To prevent condensation build-up at the windows, the thermal bridges in the frame assembly had to be kept as minimal as possible. Picture courtesy of: Toralf Schmidt, Engineering Consultancy for Building Conservation, Leipzig, Germany



Gold-coloured Thermix muntin bars and Thermix TX.N plus spacers from Ensinger helped to considerably improve insulation of the frame assembly. The U_w value of the windows now even exceeds EnEV requirements at $1.1 \text{ W/m}^2\text{K}$. Picture courtesy of: Toralf Schmidt, Engineering Consultancy for Building Conservation, Leipzig, Germany



The plastic used for Thermix[®] TX.N[®] plus spacers is 700 times less thermally conductive than conventional aluminium. Used in combination with gas-tight stainless steel sheathing, a particularly low heat transfer coefficient is achieved, making Thermix muntin bars and Thermix TX.N plus an excellent warm edge solution. Picture courtesy of: Ensinger, Ravensburg, Germany

Photos in printable quality are available via [Download ZIP](#) or press.info@oha-communication.com

Contact for editors:

Ensinger GmbH

Marnie Röder

Rudolf-Diesel-Str. 8 • 71154 Nufringen • Germany

Tel.: +49 7032 819 244 • Fax: +49 7032 819 270

email: m.roeder@de.ensinger-online.de

Internet: www.thermix.de/en

PR Agency:

oha communication

Oliver Frederik Hahr

Auf dem Haigst 23 • 70597 Stuttgart • Germany

Tel.: +49 711 5088 65821 • Fax: +49 711 5088 65829

E-Mail: oliver.hahr@oha-communication.com

Internet: www.oha-communication.com/ensinger

About Thermix[®]

Using Thermix[®] TX.N[®] plus spacers helps to significantly reduce heat loss at the glass edge, while the periphery of the window on the room side remains warmer, lending the glass a “warm edge”. Higher temperatures at the glass edge on the room side prevent the formation of condensation, ensure less cold air radiation near the window and so help achieve a healthy room atmosphere. This technology also helps users to achieve significant energy cost savings



and at the same time makes a valuable contribution to improving the energy efficiency of buildings. More information: www.thermix.de/en

About Ensinger

The Ensinger Group is engaged in the development, manufacture and sale of compounds, semi-finished materials, profiles and technical parts made of engineering and high performance plastics. Ensinger uses a wide range of manufacturing techniques including extrusion, machining and injection moulding. With a total of 2,100 employees at 27 locations, the family-owned enterprise is represented worldwide in all major industrial regions with manufacturing facilities or sales offices. For more information, go to www.ensinger-online.com.