binderholz

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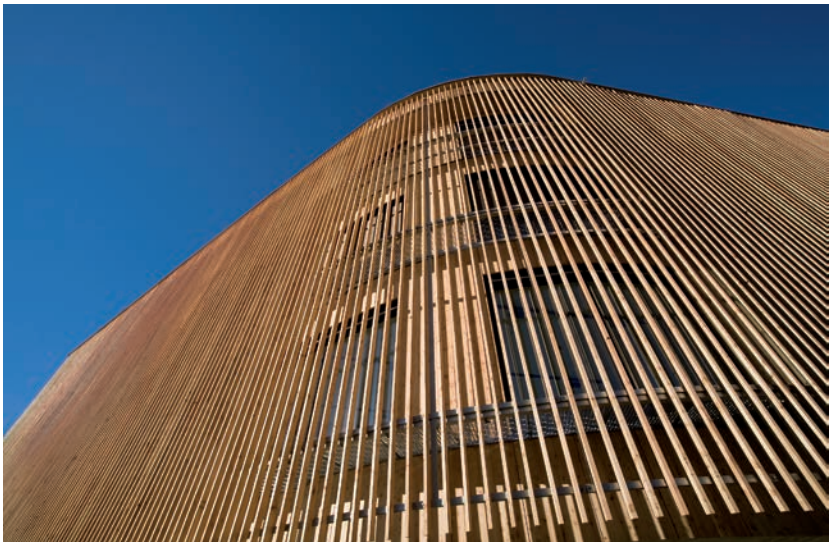
BINDERHOLZ HEADQUARTERS, FÜGEN I A

4-storey office building in binderholz CLT BBS

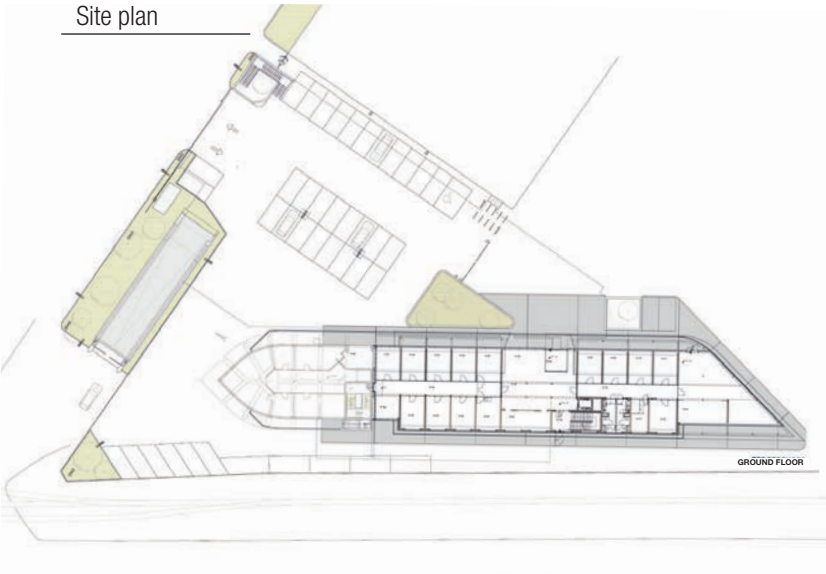
A competition to design an extension to the binderholz administration building in Fügen/Tyrol (A) was launched in 2006. Just before Christmas the jury (chaired by Hermann Kaufmann) voted in favour of the project by architect Helmut Reitter; construction began in the following march and the new office building was up and running by the end of 2007. Back in the 1990s the company had appointed renowned architect Josef Lackner, an icon of 20th century tyrolean architecture, to design it's headquarters. A lack of space resulted in an opportunity for Helmut Reitter to add a further building to Lackner's emblematic architecture.



Project description

At first glance the cube does not seem to reveal any communality between old and new. However, the new building is in fact oriented on the existing structure to a much greater extent than is at first apparent: it is an exact extension of the three-aisled design. The building's depth and the equality of the long sets of timber support all common office typologies. Its strict linearity that could easily become lost in banal corridors is broken down over multi-storey connecting rooms such as the reception area at the heart of the building, the two-storey sales room to the south and the transition to the old building. A minimised floor structure made it possible to adopt the storey height of the old building, thus gaining room height and avoiding complicated transitions. The dynamic end of the building to the south is not the result of a formal decision but rather the reflection of a minimum turning curve.

Site plan



Architecture Helmut Reitter
reitter architekten zt gesmbh
www.reitter.cc

Project management Sebastian Grundmann

Builder Binderholz GmbH
www.binderholz.com

Structural design merz kley partner
www.mkp-ing.com

General contractor
Grossmann Bau GmbH & Co.KG
www.grossmann-bau.de

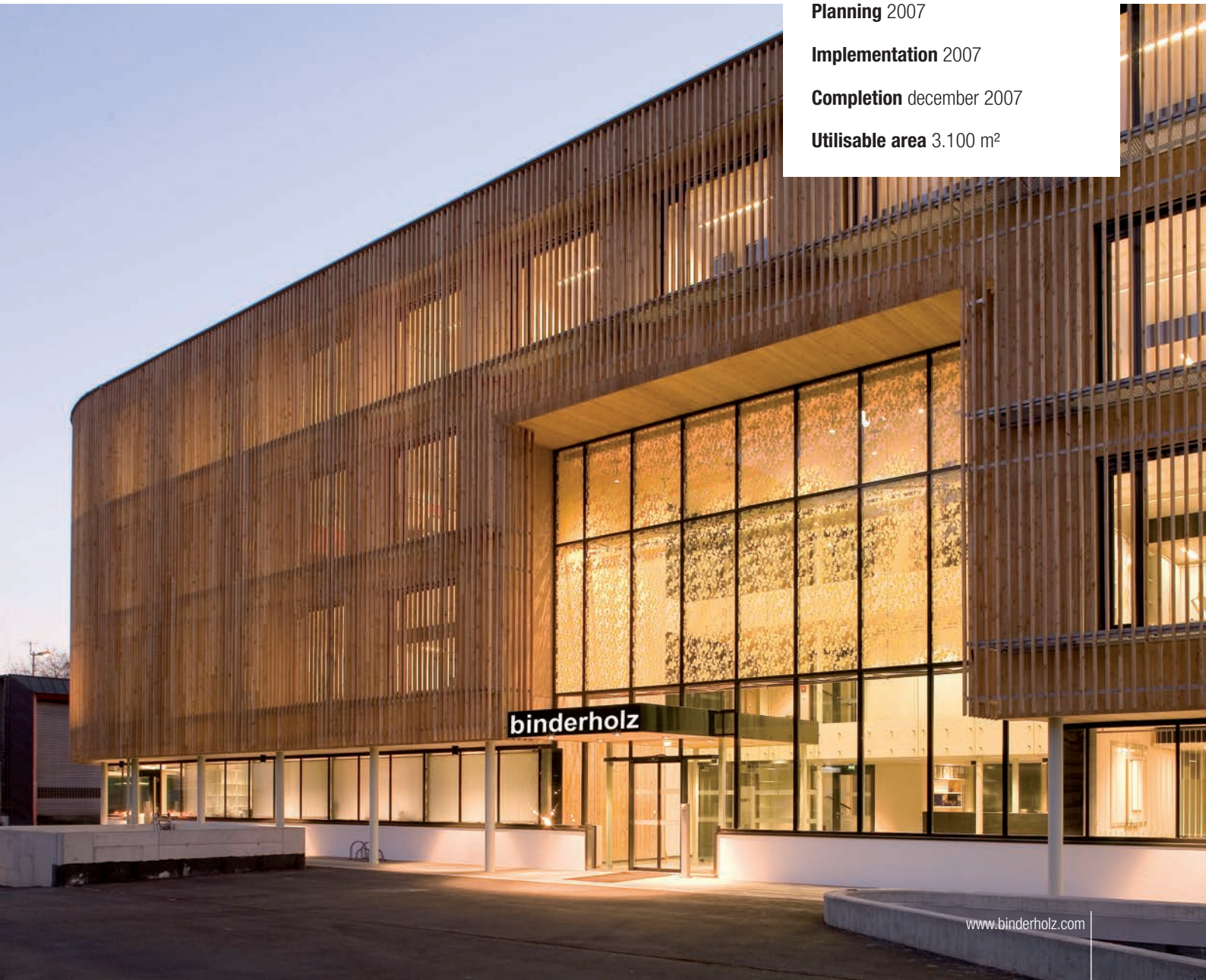
Competition 2006

Planning 2007

Implementation 2007

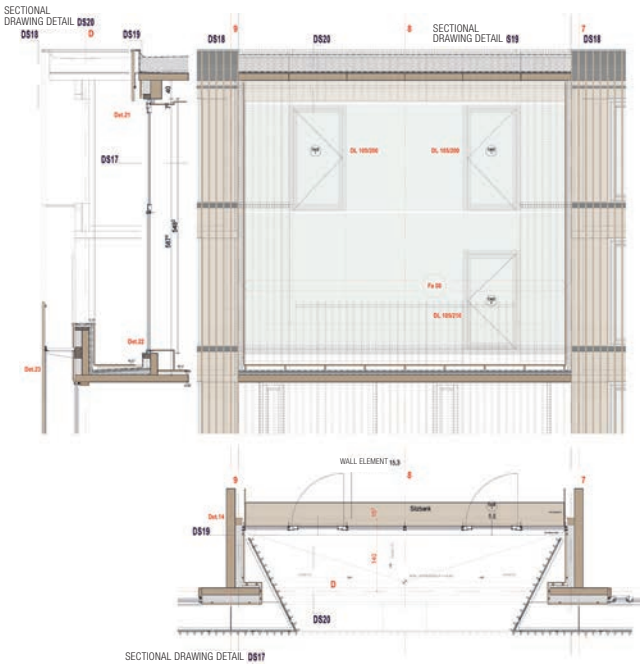
Completion december 2007

Utilisable area 3.100 m²

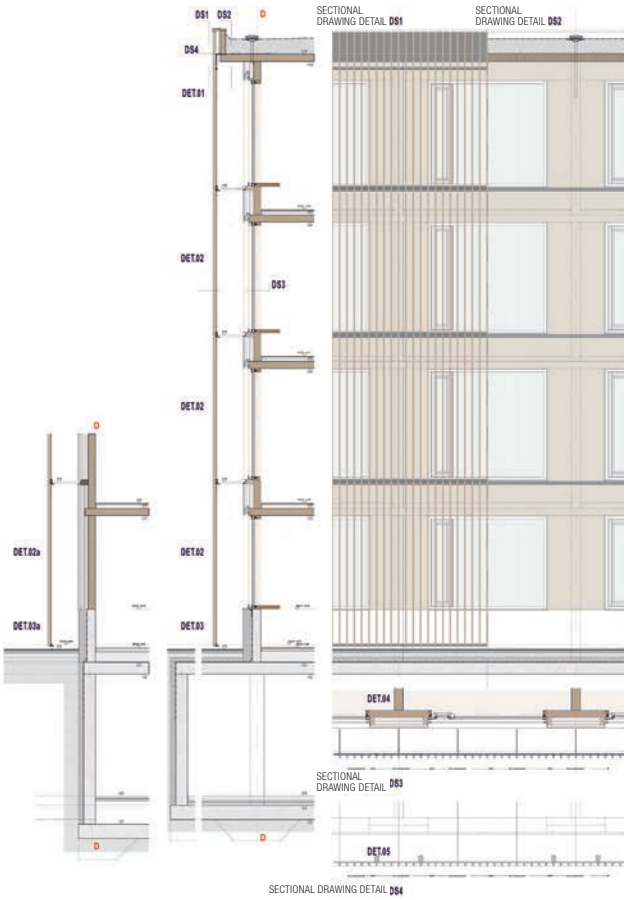


Reception area

Conference room

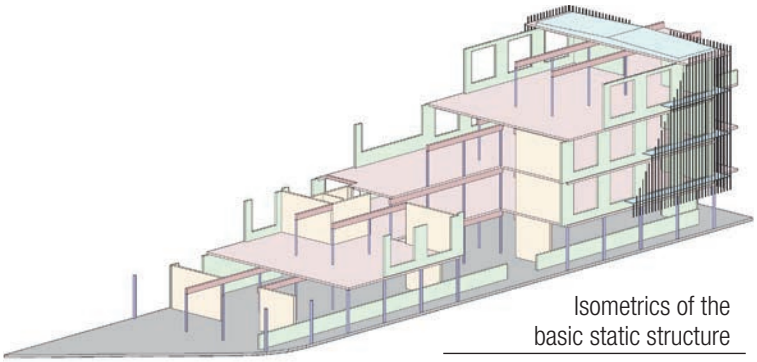


Facade sections



Approach

The chosen depth of the building enables every kind of modern office form such as cells, combi offices, open plan and „business club“. The best possible use is made of the available space, whilst the contour of the existing exhibition room was brought to a dynamic closure to the south. The outer shell consists of wedged larch wood slats - in the form of a transparent curtain. The external appearance is a striking homogeneous body, whilst the interior is characterised by transparency. Warm, filtered daylight and partial screening support concentrated working.



Isometrics of the basic static structure

- CLT BBS panel dimension 1.25 m
- Supporting exterior walls and supporting parapets and ceilings constructed from 15 cm thick CLT BBS
- The interior CLT BBS walls are not load-bearing to enable flexible room designs
- Stairwell, stairs and lift shaft are made from CLT BBS
- Two interior supporting axes with 40 cm glulam beams, corridor span = 3.50 m and 3 m x 1.25 m = 3,75 m along the facade
- The high-comfort air conditioning system – a major component of the energy concept – runs through a suspended ceiling in the centre zone

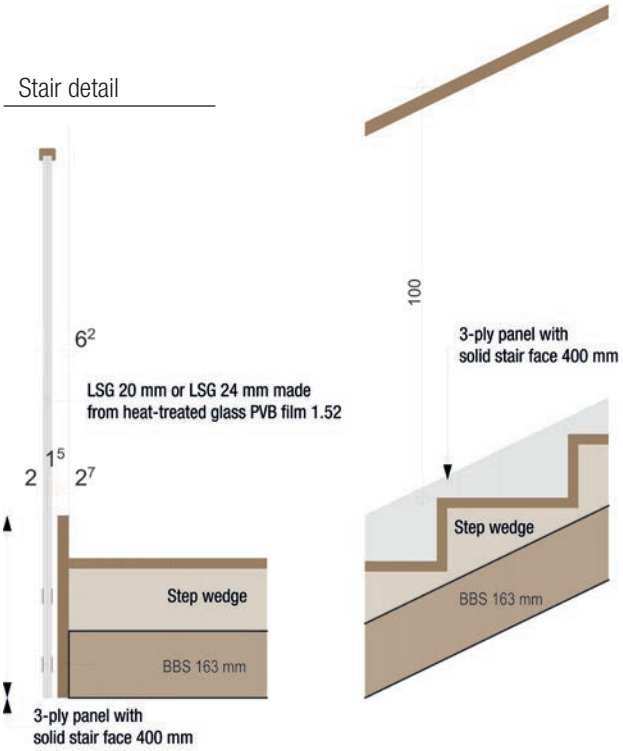
Construction

A modular order was superimposed on the design concept during the competition phase to accommodate the axial grid of the BBS 125 elements. Thus, the widths and lengths of the roof, ceiling and wall components comprise multi-jointed or halved elements. The supporting exterior walls and supporting sills and ceilings are constructed from 15 cm thick and 1.25 m wide CLT BBS elements with an insulating jacket measuring 30 cm on the roof and 16 cm on the exterior walls. The two internal supporting axes are made from 40 cm glulam beams with a span of 4.375 m. With the exception of the internal steel supports the entire structure including the stairwell and lift shafts is made of solid wood. CLT BBS ceilings designed as three-span supports span the length of four bearing axes. The external walls break down into narrow struts with overlays as sills to create large, lintel-free openings. The interior white-painted walls are not supporting structures and enable flexible room designs. The high-comfort air conditioning system – a major component of the energy concept – runs through a suspended ceiling in the centre zone.

Fire protection

Load-bearing structural components are Class F 60 fire resistant. The building is equipped with an automated fire detection system. There are two vertical fire sections separated by the north wall of the stairwell. The hall stretching across all floors is ideal for smoke extraction via the roof.

Stair detail

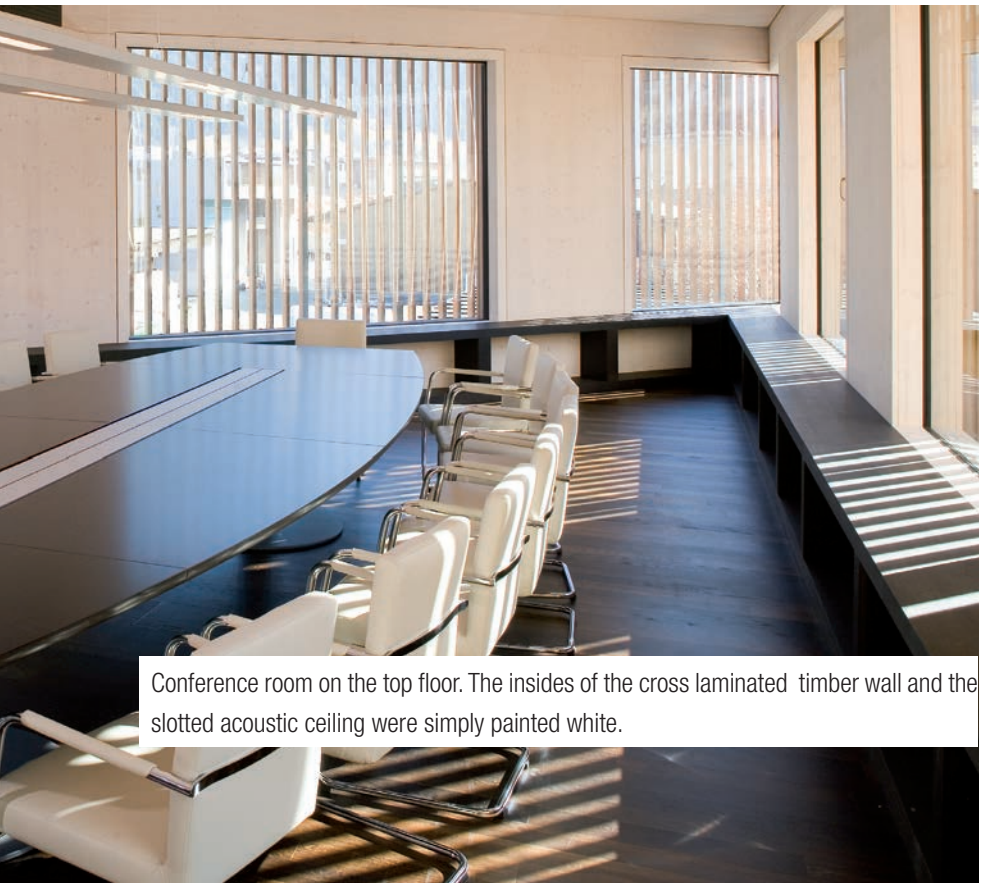


Room climate & energy efficiency

A glance at the wall structure makes one wonder how 16 cm of cladding can conceal a passive house. Our minds are programmed to think of the winter season in connection with saving energy. In contrast to residential buildings, however, office buildings use more energy in summer to keep them cool due to greater internal loads and a larger proportion of glass in the structure. As much as the heat generated by people, computers, lighting and solar energy is beneficial in winter, it is detrimental to the energy balance during the summer months. It is not seldom for office buildings with a high energetic quality to overheat during transitional periods such as spring and autumn. This means that the passive protection against summer heat has a particular significance. There are many strategies for wood construction designs that can used not only to meet a building's physical demands but also incorporated in an overall concept. The vertical wooden slats on the facade create a permanent and low-maintenance sun screen. The depth of the slats and the distance between them are designed to provide maximum transparency on the inside and optimised protection against sunlight on the outside.

The vertical slats on the long east and west facades provide a screen against the low-lying, incident sunlight of the morning and afternoon. There is also an additional textile blind for customised screening. It is this consistent screening that allows for generously dimensioned window formats without the need for extensive technical expenditure. Incidentally, the reflection from the untreated surface of the wood creates a very pleasant light modulation in the rooms. All of the separating walls in the corridors are fully glazed; this creates a very open office atmosphere whilst helping to reduce the internal load created by light fittings.

Energy supply, heating, ventilation and cooling



Conference room on the top floor. The insides of the cross laminated timber wall and the slotted acoustic ceiling were simply painted white.

The building is heated and cooled via district heat (60°C) generated from waste gas condensation from the existing bio-mass plant (architecture by Helmut Reitter) to which a convention centre, a restaurant and a wood exhibition and experience centre were added at a height of 16 metres (www.binder-feuerwerk.at).

The primary energy has a temperature of approximately 105°C and is used as district heat for the village of Fügen and as process heat in production. An innovative absorption refrigeration plant (with a saline solution as a coolant) provides ecological cooling energy. Inside the office rooms, fresh air is distributed horizontally throughout the hall zone from where it is transported to the office areas through special induction outlets for supply air.

This system is used to heat supply air with a heat recovery rate of 70 %; it is also used to cool the humidify the air. All of these measures add up to a heating demand of 15 kWh/m²/a. The primary energy rating of 74 kWh/m² utilisable area is extremely low and is achieved mainly through the use of absorption cooling energy generated by the bio-mass heating plant.

The limit value of 120 kWh/m² per annum for passive house quality is much higher in comparison. This is due specifically to the absorption cooling energy generated by the in-house bio-mass plant.

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The large-format windows behind the dense covering of slats are only visible at night. During the daytime the building appears as an abstract structure to passing motorists.

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Binderholz Bausysteme GmbH
A-5400 Hallein/Salzburg · fon +43 6245 70500-0 · fax +43 6245 70500-127
bbs@binderholz.com · www.binderholz.com

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