



# TECHNO

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## *gramm*

**Security  
Convenience  
Design**





left to right:  
Ewald Marschallinger, Jürgen Pratschke, Guido Felix and Ulrich Wagner.

***Dear business partners and friends of our company,***

When MACO decided years ago to manufacture in Austria rather than in low-wage countries, this was a sign of their commitment to both product quality and their qualified employees at the three production locations in Austria. However, the economic crisis, which has now lasted for more than five years, increasing competition from low-wage countries and the divergent order situation in important hardware markets have put pressure on even our very healthy company to operate successfully.

In order to be optimally equipped for these market conditions, MACO has realigned itself over the last few months. This has not just focused on cost savings or headcount reductions, but also on organisational simplification. This will not only advance our product development process but will also contribute to MACO's position as a future leader.

We have set ourselves up to be sleek and agile enough for the future. This restructuring did also not stop at management level; this has been substantially reduced so that decisions can be made quicker and more efficiently. The most obvious sign is the new senior management team, who are already providing steady leadership for the family firm's restructuring and bringing fresh impetus to the company in the form of Guido Felix, Ewald Marschallinger and Ulrich Wagner. MACO is now substantially faster and more flexible than in the past. This change, combined with innovative solutions and

appropriate market performance, will ensure that other markets become more aware of us in the future.

Furthermore, we have introduced and are implementing measures which will lead to solid optimisations in both our product portfolio and service level for you, our customers and business partners. At Fensterbau Frontale, the leading trade fair, we will be presenting new, amazing and astonishing products on the themes of design, security and convenience. However, we would like to tell you about some of these innovations now in this TECHNOgramm.

One of the key aspects of this edition is our total competitive advantage when it comes to security solutions. Currently, windows with a burglary-resistance grade of RC 3 with a complete system matrix for units of all sizes are only possible with MACO hardware! On the topic of security and burglar resistance, in addition to the article on the physics behind the hardware, there will also be a summary of the development of certified burglar-resistant hardware at MACO over the last 15 years.

We will also present to you new solutions for casement doors which not only fulfil the criteria for being barrier-free but also make them more secure, more energy-efficient and more aesthetically appealing. The articles on pages 10 and 13 show that MACO doesn't only produce window hardware; we are also a complete provider of optimal

solutions for doors and L&S units. Come and take a look at Fensterbau Frontale; we're sure you'll like what you see.

Even in the current challenging situation, we have made successful progress. We will continue to back Austria as our production location and thus the unique vertical integration that this offers us here. This great potential enables us to react quickly to requirements even at short notice. By becoming structurally leaner, investing in new, high-tech production facilities and expanding our production capacity, as we plan to do over the next few years at the Salzburg site, we can secure the flexibility needed to continue to align ourselves consistently with our customers and their needs. MACO thus remains your strong, efficient partner.

Finally, we hope that you enjoy reading this edition and send our greetings from Salzburg!

MACO Senior Management

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MULTI POWER in combination with Grundmeier, Trocal or Veka thresholds

# Barrier-free design now also available for PVC casement doors

**Smooth transition between living space and balcony or garden due to extremely flush thresholds. Using TRANSIT thresholds on timber casement doors makes tripping over a thing of the past. MACO now also offers the ideal solutions for PVC profiles.**

PVC balcony and patio doors used to mainly be made with continuous frame profiles and surface-mounted, visible, bearing points. They were also easy to trip over and difficult to clean. To fulfil customer demands for a clean, modern design with no barriers that complies with ÖNORM and German industrial standards, the

fully concealed MULTI POWER hinge-side can be combined with Grundmeier (GKG), Trocal or Veka thresholds.

## FOR HEAVY LOADS

The result is units with a maximum sash weight of 110 kg (GKG and Veka) or 130 kg (Trocal). When making these heavy units, all the components used must be manufactured carefully and precisely, starting with the joint between the frame profile and the threshold. They must be correctly joined in order to reliably and consistently transfer the high torsion forces of an open sash over the corner hinge.

## SYSTEM-DEPENDENT INSTALLATION

It is just as important to fit the corner hinge correctly, with the appropriate spacer bar for the threshold and/or frame profile. Installing the MULTI POWER corner hinge in line with the system being used also strengthens the corner connection between the frame profile and the threshold. Fitting a stable lining and bolting the entire threshold to it ensures that the unit can be operated safely and consistently for decades to come.

## COMPREHENSIVELY TESTED

As well as a long service life, all specifications for joint tightness and watertightness are also fulfilled. This has been determined and confirmed by extensive in-house tests and inspections. There's now nothing stopping plastics processors from manufacturing casement doors with invisible hardware.



Barrier-free PVC casement doors for greater convenience, now a reality thanks to the addition to the MULTI POWER range of thresholds by Grundmeier (left), Trocal (centre) and Veka (right).



MACO MULTI

New hinge-side can support casement doors weighing up to 160 kg

# A powerhouse for greater comfort and warmth

With the expansion of the existing MACO double pot range, now even heavy timber casement doors with a sash weight up to 160 kg can be produced. The new hinge-side has a guaranteed burglary-resistance grade up to RC 3.





Additional screw holes in the corner and scissor stay hinges ensure the necessary load distribution and a secure hold. The DT160 hinge-side is easy to combine with the existing double pot range (DT130).

**Modern construction and living combine large-scale window formats with extremely high energy efficiency requirements. Large windows, however, should not mean increased losses in heating energy. The new DT160 hinge-side takes into account the development of increasingly heavy window units. It can handle heavy timber casement doors up to a sash weight of 160 kg and thereby expands the existing double pot range, while still being fully compatible with the existing MULTI-MATIC parts.**

#### FOR HEAVY LOADS

With a load capacity of 160 kg, the new double pot hinge can be used by the majority of timber casement

door manufacturers. Triple or even quadruple glazing for maximum insulation values is not a problem, even with large sash formats up to a maximum width of 1650 mm or a height of 2600 mm. Additional screw holes in the corner and scissor stay hinges ensure the necessary load distribution and a stable hold. Security is also a high priority: The new hinge-side can be used up to burglary-resistance grade RC 3.

#### CAN BE COMBINED WITH EACH OTHER

The substantial advantage for you as a fabricator: The DT160 hinge-side can be combined with the existing double pot range (DT130) and can be used in turn&tilt and tilt-first versions as

well as casement doors with or without thresholds. The turn&tilt version can also be fitted with an optional night-vent.

#### OPTIMAL THERMAL INSULATION

The new double pot base consists of two-component PVC. This means that, for the first time, two different material hardnesses are combined in one component. The solid, harder body is completed with a sealing lip and a moulded seal on the underside made of softer plastic.

The sealing lip ideally compensates for the gaps in the gasket level created by the rebated scissor stay support arm. In addition to the low thermal conductivity of both materials, this ensures that hardly any condensation forms, whilst improving thermal performance. An additional benefit is that the elastic rubber seal on the bottom of the double pot basic profile also provides height compensation in the event of slight variations in processing.

#### FAST INSTALLATION AND MAINTENANCE

The drilling and routing pattern is identical to the existing double pot range so as to ensure easy fabrication of the new double pot hinge-side (with the exception of profiles with a 4 mm air gap/15 mm rebate leg/9 mm hardware axis offset). Thanks to the uniform screw pattern for the corner and scissor stay hinge with 7 screws

each, screws can be mechanically fixed to the frame. An integrated lubrication hole, which now allows greasing of the rebated corner support during operation and without unhinging the window unit, ensures quick and cost-effective maintenance of the corner hinge. An important advantage for your customers!

#### TIMELESS DESIGN

Attractively shaped cover caps cover the corner and scissor stay hinges, thereby ensuring an attractive look. In addition, the routing required for the 4 mm air gap design is now concealed underneath a recess cover cap for the entire range. The new covers have the same design as the existing ones, which means they can be combined as desired. In addition, all new cover caps also match the DT130 range. This means maximum flexibility for you.

Another advantage of the new covers for scissor stay hinges is that they ensure the correct location of the scissor stay hinge pin, as the cover can only be applied once the pin is completely inserted.

#### MINIMUM STOCK REQUIRED

The range of corner and scissor stay hinges has been considerably reduced for 12-gap systems. For example, the corner hinges can now be used for both windows and casement doors. This makes logistics easier for fabricators and ensures low stock holding costs.



An integrated lubrication hole allows the rebated corner support to be greased during operation without unhinging the window unit.



### 2001

#### INDIVIDUAL TESTS AS STANDARD

Until 2002, individual tests (in proportion with the standards) for burglary-resistance grades 2 and 3 were common practice. Special inspections were only carried out occasionally, such as when Glöckler windows in a prison were tested for RC 3 to ensure they were escape-proof.



A journey through time: From individual customer tests to the MACO system test

# Pioneering the highest levels of security

MACO is the specialist you can trust when it comes to mechanical burglar resistance. Consistent focus on the latest security features and developments, particularly in the last 15 years, has resulted in the hardware specialist

building up extensive know-how, becoming security pioneers in today's industry.

TECHNOgramm takes you on a journey through the last 15 years.



## 2002

### RETHINKING SYSTEM TESTS

As there is considerable effort and expense involved in lots of individual tests, industries and institutes looked for a way to carry out these tests on whole profile systems. They needed burglar-resistant hardware that could be used for a specific application range (width and height) and was at least RC 2-compliant. MACO provided the solution with MULTI-TREND-i.S. The first system matrix for timber and PVC to be designed around both the application range and the maximum locking distance was developed.

## 2003

### AVALANCHE PROTECTION

The 1999 catastrophe in Galtür triggered the development of a test method for classifying the avalanche resistance strength of windows (ÖNORM B5301 dated February 2003). Together with Veka, MACO set itself this new challenge: In a three-part test at the inspection body Holzforschung in Austria, a casement door was tested at avalanche protection level 10 (yellow zone: 1000 kg/m<sup>2</sup>): Part 1 simulated the debris that accompanies an avalanche, part 2 the pressure of the avalanche and part 3 the mass of snow pressing on the window. The adhesion only gave way at 2400 kg and the glass was forced out, but the hardware continued to hold. A further test at avalanche protection level 15 (red zone: 1500 kg/m<sup>2</sup>) carried out in cooperation with Pfisterer was passed with flying colours.

## 2005

### FLOODING WAS A NEW CHALLENGE

Both floods and avalanches were natural dangers in Austria that required solutions that would protect the public. This led to ift publishing the guidelines "Flood-resistant windows and doors FE-07/1" in 2005, against which MACO's hardware was tested based on current flood catastrophes; they passed immediately.

## 2006

### FIRE PROTECTION IS ALWAYS VITAL

Fire protection tests in accordance with EN 1634 have always been a hot topic. Together with customers, several tests were carried out at the FFF Institute in Switzerland and at the IBS in Linz. A window was installed in a wall in front of a furnace with four burners, which were then lit. If the pre-set standard times were exceeded by 20 per cent, the approval certificate also applied to large-scale units.

## 2002

### MACO i.S. IS OUTSTANDING

Tensions were high when the first system test was tackled in autumn 2002 and all tests at ift Rosenheim were passed easily; the first one was the profile system for single and 2-sashed windows from Stöckel. The following system test with Gealan and another one for timber systems were also successfully carried out. They determined as follows: The system matrix and the MACO i.S. hardware with Zamak (zinc aluminium alloy) striker plates comply with burglary-resistance grade 2 in accordance with German industrial standard EN V.1627-1630.

## 2005-2006

### SYSTEM TESTS AS STANDARD

Further system tests followed over the years, including Rehau, Aluplast and Veka in 2005, when installation steps (e.g. attachments or with spacer bolts) were also tested. The system test carried out in 2006 for Trocal included simulations with roller boxes, attachments, distance, etc. For the Kömmerling system test, carried out with the profine group, all profile versions, including country-specific systems, were tested.





## 2007

### MULTI-MATIC HARDWARE SSYTEM

In 2006/2007, MACO released the hardware solution MULTI-MATIC; this required a new system matrix. At the end of 2007 and the beginning of 2008, all existing system tests were therefore cross-checked using reference tests. As a result, MACO received approval certificates for the whole of their new hardware range.

## 2009-2010

### NEW PROFILE SYSTEMS, NEW SYSTEM TEST

Over the next few years, profile manufacturers continually developed new profile systems, with the result that 2009 and 2010 mainly consisted of comparison tests. In addition to tests for windows, there were also tests for burglar resistance on doors and large-scale units.

## 2011

### WK BECOMES RC

In August 2011, the previous German industrial standard EN V 1626-1630 became EN 1627-1630 and all burglary-resistance grades are now referred to as RC, instead of the German WK. This new definition meant that all WK 1 tests were no longer valid. This is because the requirements were higher: All joints from the sash to the frame now had to be tested, including the hinges, which previously had not been defined as being relevant to security.

## 2013

### FOCUS ON HINGE SYSTEMS

An increasing number of requests from customers inspired MACO, in parallel with the Schüco system test, to develop a system in 2013 that also included hinge systems. As part of the Schüco test, MULTI POWER, MULTI MAMMUT and all surface-mounted hinges had already successfully passed RC 1 N, RC 2 N and RC 2 tests. However, that wasn't enough for them: MACO submitted all hinge systems for all system tests and received approval certificates for all of them. This gave MACO licence holders a huge advantage: Whichever hinge system they use, it will always comply with at least RC 2.

## 2011

### NEW RC 1 N SYSTEM MATRIX

At the end of 2011, the first two system tests, Salamander and Brügmann, which included the different hinge systems, were passed with flying colours. In 2013, MACO specifically created a new system matrix for RC 1 N\*, which was then successfully tested in the middle of 2014 with the system supplier Veka.



Hinge-sides became relevant to security when the industry standard EN 1627-1630 came into force in 2011 and they had to be included in tests.

\*N - normal glass, no requirements for glazing



## 2015

### RC 3 PIONEERING WORK

In 2015, single and 2-sashed turn&tilt, turn-only and tilt-only windows as well as fixed glazing in timber successfully passed a brand new format of an RC 3 system test (see article in TECHNOgramm 2/2015). The new feature was a connection to the MACO-TRONIC contact for locking monitoring, i.e. a contact for alarm systems that is integrated into the hardware. The objectives were extremely tough: All hinge systems needed to be tested. In addition, MACO developed two new products as part of a separate project in order to provide a French window option as well. Numerous pre-tests in MACO's own test centre produced a solution and at the beginning of 2015, it successfully passed testing at ift Rosenheim. Work is now ongoing to expand the range for timber/aluminium and some French window solutions have already been successfully tested. Once again, MACO is bringing fresh ideas into the hardware market.

## 2014

### CHALLENGE

#### NO REINFORCEMENT

A new feature of many of the profile systems developed (aluplast Energeto, Rehau Geneo, profine 76) is that they were either not reinforced or only at the corners. This was a new challenge for burglar resistance tests, which were successful when profiles were fitted with MACO hardware.



## 2014-2015

### COMPLETE PROFILE SYSTEM DEMONSTRATES BURGLAR RESISTANCE

Working in close cooperation with system supplier Inoutic/Deceuninck, the hardware manufacturer MACO tested a complete profile system for RC 1 N, RC 2 N and RC 2. One of the reasons that the comprehensive test at the ift Institute in Rosenheim was passed successfully was that an i.S. striker plate developed by MACO was used. Its rear-engaging edge in the profile shape guarantees a better hold and thus improved burglar resistance. Fixed with only three screws, not into the reinforcing steel, but directly into the PVC, it makes assembly much easier for the fabricator as no pre-drilling is needed.

### BECOME A LICENCE HOLDER

Over the years, MACO has carried out over 20 different system tests with system suppliers and customers which you as fabricators, under certain conditions, can use in proven licensing procedures. New products on the market and from our partners, as well as customer demands, are constantly integrated into existing tests and result in new product solutions. This makes MACO a strong partner and a true professional when it comes to helping you with mechanical burglar resistance solutions!





With its main product group **RAIL SYSTEMS**, MACO has been setting the pace for high-performance, convenient L&S solutions for timber units for years now. Most recently, the full-range supplier has made up for lost ground in the area of PVC and has developed specific hardware solutions for the whole European market, together with major German-speaking profile manufacturers: Current system suppliers such as Aluplast, Gealan, Inoutic, Profine, Salamander, Schüco or Veka rely on the MACO L&S hardware system. One example of successful cooperation is that of Rehau and the Geneo system.

As one of the major PVC profile manufacturers, Rehau planned to expand their Geneo system for L&S doors and were enthusiastically supported by MACO. MACO hardware components, spacer bars and accessories were adapted to the profile and adjustments for the GFK thresholds were developed, designed and manufactured. The joint project took several months and led to the units being successfully tested at ift Rosenheim. They all passed CE marking tests, including those for joint impermeability and watertightness. MACO is therefore listed as one of the exclusive hardware manufacturers for Rehau's Geneo system.

### CE MARKING INCLUDED

In addition to Rehau, our hardware is integrated into many other profile manufacturers' various system folders for CE marking. As a fabricator, you can obtain CE

marking from the system supplier. It couldn't be easier to manufacture L&S doors that conform to CE standards. Naturally, you also have access to all of the documentation (assembly instructions, sales brochures, certificates, etc.).

By having CE marking, you are showing your customers that they are purchasing a high-quality product that complies with European standards and regulations with regard to issues such as fire protection, accident prevention, environmental protection and safety. They are therefore receiving a guaranteed safe, reliable L&S solution with clear documentation of CE conformity. In addition, QM346 certification from an external testing institute bears witness to the long-term performance of our L&S components. You can rest easy knowing that these products have both CE and QM certification!

### PARTNERSHIP WITH MANY PROFILE MANUFACTURERS

As a full-range supplier, hardware experts MACO can offer a customised solution for almost any PVC profile system (e.g. Aluplast 70 and 85, Deceuninck 76, Gealan S8000 and S9000, etc.) in the form of specially developed hardware and adaptations and individually made spacer bars. Contact your MACO technical consultant for more information!

Blend the inside and the outside, with large L&S units.

# Customised solution for all PVC profile systems





## Full documentation

MACO provides all documentation for each specific profile manufacturer. Assembly instructions, order lists, the MACO technical online brochure, etc., are customised for the profile system in question. You therefore receive all relevant information and instructions directly from us. With MACO, you're always in safe hands.

## Strong in extreme conditions

The tried-and-tested surface protection MACO TRICOAT-PLUS can be added to all hardware components if required. An unbeatable advantage: You are offering your customers windows with the highest level of corrosion protection, even in salty sea air on the coastline, in congested industrial areas with high levels of pollution or in swimming pools with chlorine vapours.

## Convincing arguments

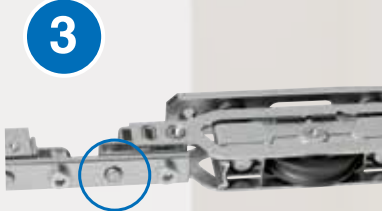
What makes MACO's L&S solution for PVC unique?

TECHNOgramm presents its main selling points.



## Greater tolerance and tightness

Locking bolts made of solid steel ensure the ideal clamping pressure on the sash gasket. As PVC profiles often warp when the hardware is fitted, MACO developed new locking bolts with a special bevelled head which can absorb greater tolerances. This therefore allows small variations during assembly and as the fabricator, gives you more leeway and faster processing times. Standard locking bolts and air-gap bolts are available. You should no longer need spacer bars to compensate for any variations, but these are available in case of an emergency.



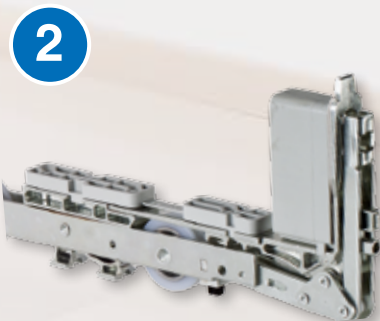
## Bomb-proof

Flat steel with pre-drilled holes joins the rollers together. Special supporting pins and screws ensure a secure join and prevent the connecting rod from sliding out, throughout the life of the product! The connecting rod is put together outside the PVC chamber and guarantees simple, swift installation in one piece. No additional processing is required.



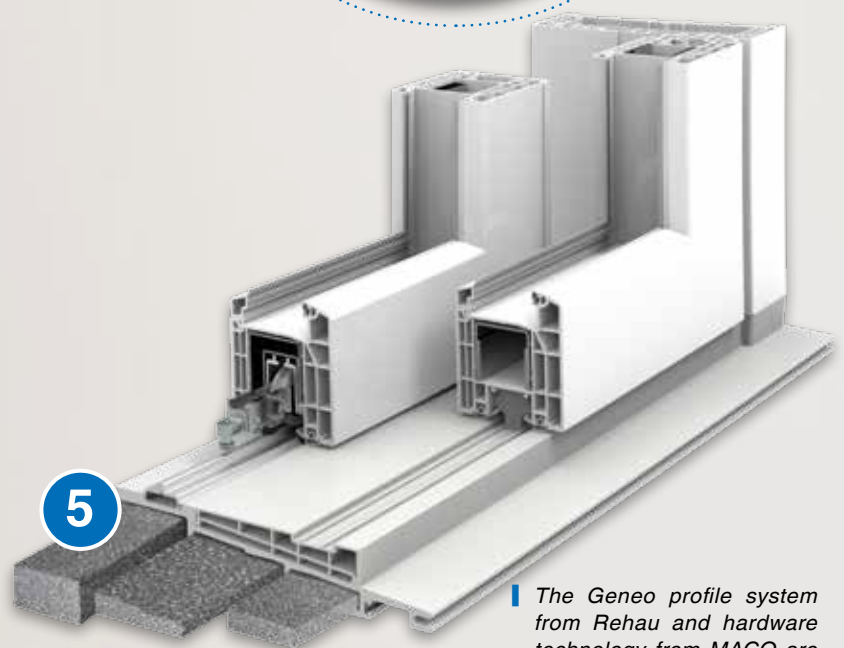
## Moves smoothly

Unique to the market, every PVC system using the MACO L&S roller comes as standard with special brush technology. These brushes, positioned in front of the rollers, remove dirt such as builder's dust, sand or pet hair from the roller track each time it is operated. This preserves the rollers even during the building stage, so that the unit can continue to slide smoothly!



## Installation highlights

Clip-on PVC spacer bars are available in different sizes based on the various manufacturers' different profile versions. This guarantees that the MACO hardware will fit the profile perfectly. A positioning nib ensures correct positioning and helps to avoid errors during installation.



The Geneo profile system from Rehau and hardware technology from MACO are the ideal combination.

## Optimal threshold insulation

A thermal barrier is not required from the outset due to the low coefficient of heat transfer of the threshold made from glass fibre reinforced PVC. Using the insert profile, the threshold achieves an incredible U-value of 0.82 W/(m²K).

## Includes barrier-free design

So that everyone can move smoothly between the inside and outside, there is a barrier-free version of the L&S solution as defined by ÖN B 1600 and German industrial standard 18040, when the MACO GFK threshold with the flat roller track and a minimum height of just 5 mm is combined with the low threshold tread board.



## Best service

Finding the right items easily? Packing that matches the profile and contains all the relevant individual components and additional hardware lists make ordering simple and straightforward. Just as before, you can order single components later, of course.



Additional rollers ensure that casements weighing up to 400 kg can move smoothly.





Modular concept also for Z-TA 3-catch automatic lock

## More flexibility - for you and your doors

With the Z-TA module, you can offer your customers one of the most efficient, automatically locking door locks that fits all door dimensions with a sash rebate height of between 1650 and 3100 mm. This is made possible by the shortening or extension faceplate. All versions are based on one standard lock.

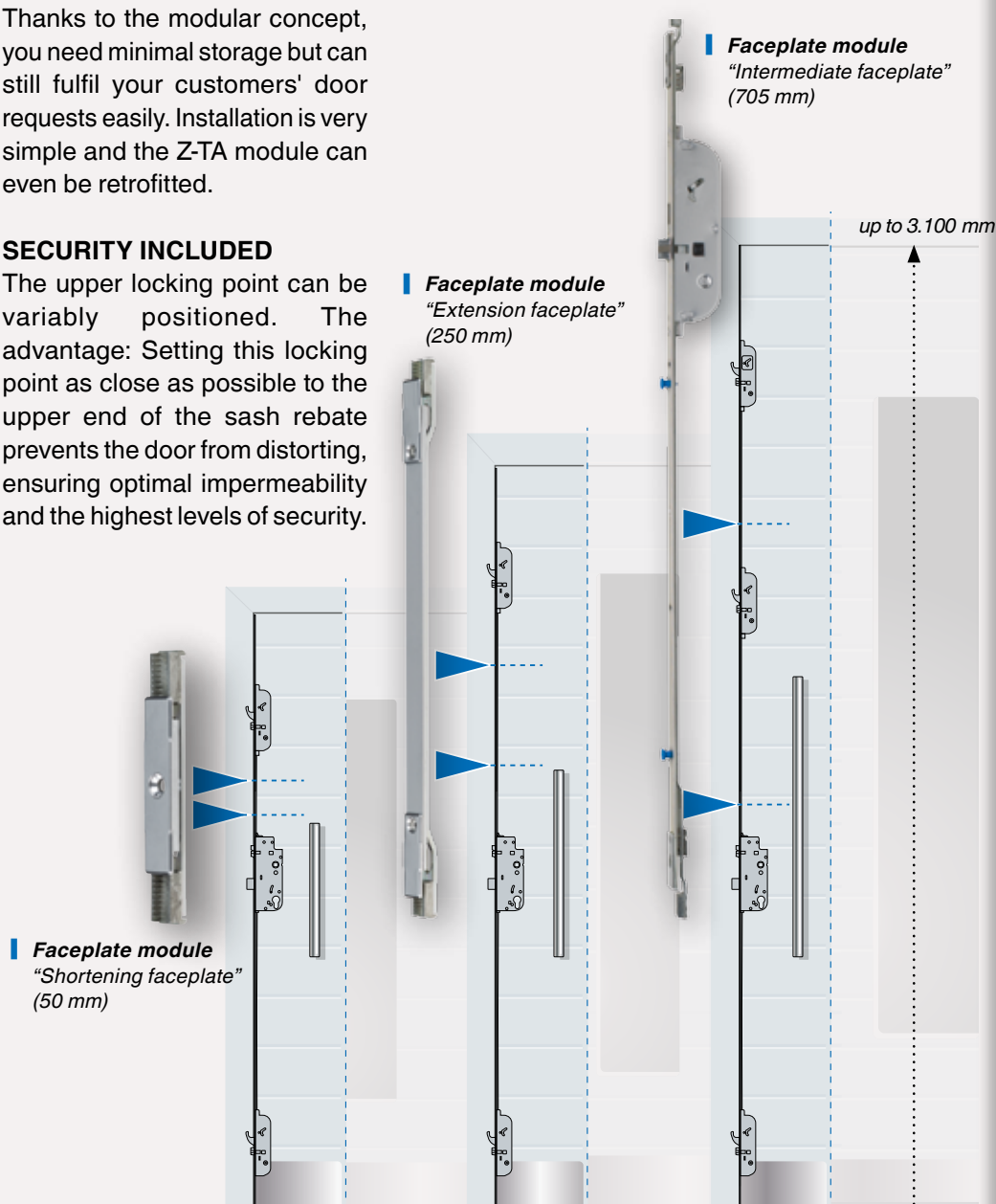
### YOUR ADVANTAGE

Thanks to the modular concept, you need minimal storage but can still fulfil your customers' door requests easily. Installation is very simple and the Z-TA module can even be retrofitted.

### SECURITY INCLUDED

The upper locking point can be variably positioned. The advantage: Setting this locking point as close as possible to the upper end of the sash rebate prevents the door from distorting, ensuring optimal impermeability and the highest levels of security.

Fitting an additional locking point to the Z-TA intermediate faceplate further increases the protection against burglary: In addition to the main latch case with a cranked latch and locking bolt, there are three additional latch cases, each fitted with a multifunctional latch and steel hook, ensuring the best mechanical burglar resistance.



Bunches of keys just keep getting bigger and for many of us, it is a necessary evil. MACO has a way to reduce this. The "Transponder-Plus" version of the openDoor access control system converts car keys to house keys.

### DOUBLE THE CONVENIENCE AT HOME

In the Z-TA 3-catch automatic lock, there is quiet motor that opens the door. The motor is controlled using the MACO's openDoor access control system. Highlight: Using special "Radio Frequency Identification (RFID)" technology, data is transmitted by a data carrier, the transponder, without physical or visual contact, to a reading device. Around 80 per cent of the leading car manufacturers' keys are suitable for use as a transponder. Most credit and debit cards can also be used (NFC technology). If the car key does not have a transponder chip, there are a number of low-price transponders available on the market, in the form of key rings, a card or an adhesive label. Another advantage: In future, your customers will be able to not only easily open their front door with their car key; transponders are also incredibly simple to program.

### EASY TO INSTALL AND SECURE

Operating and control units are attached using simple, easily identifiable connectors. This means that you as the door manufacturer can carry out the installation independently and flawlessly. The Transponder-Plus reader unit is installed directly into the door leaf. The control unit is installed inside, protecting it from manipulation by unauthorised parties. Last but not least, it's also an aesthetically pleasing solution!





Transponder-Plus  
access control  
with Z-TA makes every  
day easier

Use your  
car  
key  
to get into  
the house



Entry occurs using a car key, key ring,  
credit or debit card (NFC technology).

## MACO PRO-DOOR

Semi-concealed butt hinge combines design & durability

# The catwalk model of door hinges

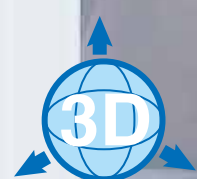
The high-quality look of the MACO PRO-DOOR T100R R is captivating: When installed, only the hinge-roll is visible on this semi-concealed door hinge for PVC front doors. The aluminium body of the T100R is available in a wide range of RAL colours with numerous anodized surface finishes, making every hinge on the door eye-catching.

### EFFICIENT POWERHOUSE

The butt hinge, made from high-strength aluminium extrusion press profiles, can support sash weights up to 100 kg. Directly screwed into the steel reinforcement, the hinge is guided into the Eurogroove, providing a secure hold. One unique feature is that the frame and the sash can be installed together. Like all MACO door hinges, the T100R can also be adjusted in three dimensions and adjusted while hung.

### LONG SERVICE LIFE

The unique patented ball bearing of the axle pin prevents the door sash from dropping. This is because the axle pin doesn't move "freely" within the sleeve but sits on a ball that keeps it in position. The axle pin therefore can't dip or wear down the sleeve: The door stays permanently in position. The highly creep-resistant, fibre-reinforced plastic of the sleeve and the steel axis pin form a functional unit that is long-lasting and operates without the need for additional maintenance.



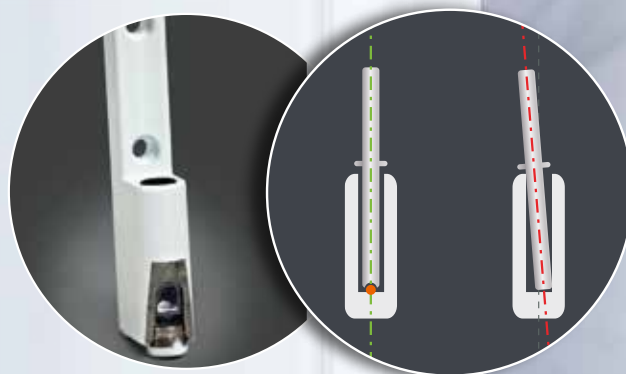
Three-fold adjustable:  
Side, height,  
Clamping pressure

100 kg

Maximum load capacity:  
100 kg

200.000

Resistance to repeated opening  
and closing:  
200,000 opening  
and closing cycles



The special shape of the MACO PRO-DOOR door hinge's axle pin prevents the door from dropping: The concave pin with hemispherical pin end rests positively connected on the ball.





**The last issue focused on the current burglar resistance standards and their implementation in loading tests and/or attempted burglaries. What does this mean in practice, though? TECHNOgramm takes a close look at the forces exerted on the hardware, whether these arise due to an attempted burglary, flooding or an avalanche.**

There are always reports in the press about apartments being broken into. Unfortunately, the numbers have continued to rise sharply over the last few years. Statistics allow us to create an image of the "standard burglar": An opportunistic thief who hasn't planned much in advance and uses a lever such as a screwdriver to jemmy the sash of a window or casement door.

### **LEVER EFFECT PUT TO GOOD USE**

Jemmying the sash is normally done by levering the underside of the unit. This is because the burglar can then use their whole body weight to exert force on the lever. The lever is pushed between the sash and the frame in an attempt to separate the locking cam and the striker plate. If the locking cam is not rear-engaging, this is often extremely easy. With this in mind, MACO developed the technology for the MACO i.S. security roller cam and the security striker plate.

### **LOCKED SECURELY**

The mushroom-shaped safety cam has an enlarged bulge on the upper side that grips the opening of the security striker plate, thus creating a fixed joint that is difficult to break.

Two main factors produce its level of burglar resistance: The size of the surface where the cam and the striker plate overlap and the stability of the materials used. The manufacturing process used for the individual components is not insignificant here: For example, MACO manufactures the bush of the security roller cam using an impact extrusion process. This shapes the raw material to the component using very high pressure. The advantage of this is that, when finished, the bush has an exceptionally stable, homogeneous material structure. This makes it extremely resistant to cracking or fracturing. The security striker plate, on the other hand, is made from Zamak (zinc aluminium alloy). This material is a bit softer which means that, when under pressure, the much harder i.S. cam bites into or wedges itself into the striker plate and the join is then very difficult to break.

### **LOADS OF SEVERAL 100 KG**

The forces that occur during an attempted burglary should not be underestimated: If, for example, a 30 cm screwdriver is pushed in 4 cm deep between the sash and the frame and a body weight of 100 kg is then applied to the handle, the resulting force on the front edge of the screwdriver is approx. 600 kg.

### **DEFLECT FORCES**

If a burglar exerts force on the locking points using their lever, this spreads pressure across the whole window and/or all locking points. First, the sash moves slightly upwards. The height-adjustable i.S. cam holds firm: This is because the force doesn't apply to the head of the

cam itself, but on the surrounding movable bush. The sash therefore only shifts slightly backwards and forwards in the frame.

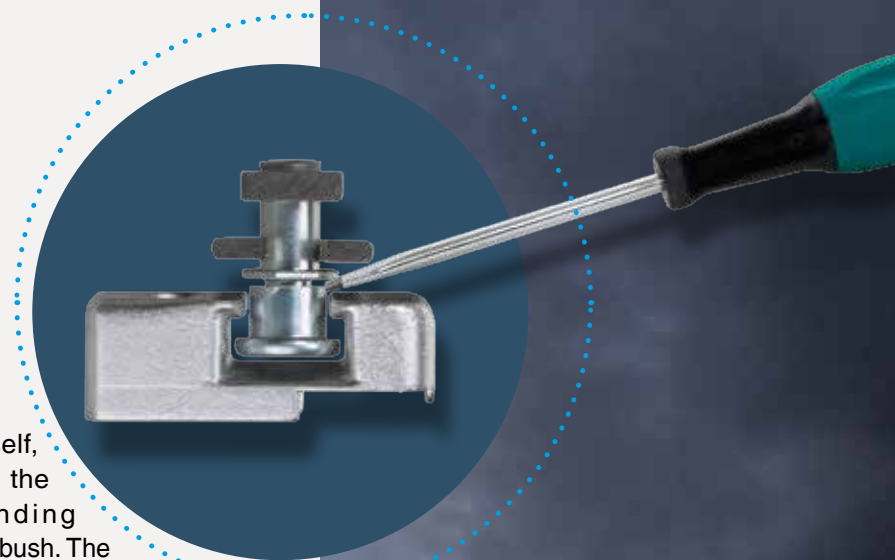
Only if the force exerted by the lever increases, the movable bush reaches its uppermost position and the sash distorts is the cam then affected by the full pressure. The force is now directly applied to the locking points, specifically to the contact surfaces of the i.S. security roller cam and the security striker plate. It's now that the stability of the materials makes a difference: The load will shear the roller cam and the striker plate in such a way that the join no longer holds; this is much less likely if the striker plate is made from Zamak (zinc aluminium alloy). If you consider that the contact surface is only a few square millimetres it becomes obvious that materials in the two components have to withstand enormous loads.

### **STILL SMOOTH**

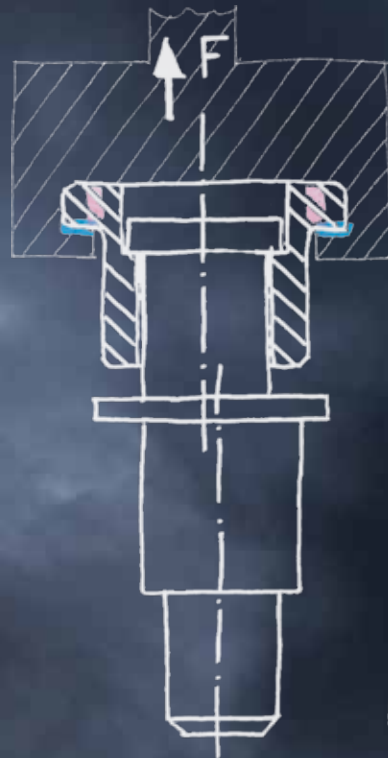
To ensure burglar resistance, there are more locking points than in a usual, comparable hardware version. This often makes other manufacturers' windows difficult to operate, but not MACO's: Even the burglar-resistant version of the central locking system requires little effort to operate, the force needed being far below the limits stated in the standards.

### **NATURAL DANGERS**

Natural catastrophes such as avalanches or floods also exert similar forces on the window: In an avalanche, the mass of rubble smashes through everything in its path. Depending on the quantity of snow, this produces huge forces







$$p = \frac{F}{A} = \frac{F}{\frac{\pi}{4} \cdot (D^2 - d^2)}$$

Mushroom cams & security striker plates  
defy burglars and natural forces

# MACO i.S. Intruders don't stand a chance!



$$\gamma_a = F : A \quad \gamma_a = \frac{F}{\pi \cdot d \cdot h}$$

that strike individual points such as locks, glass, fixings, etc. The pressure of the snow increases more and more until the window is completely enclosed by it. All of the pressure is now focused on the sash, which distorts and is only held in the frame by the locking points spread across the whole sash, including the i.S. cam and the security striker plate.

The same happens with floods: This brings dirt and branches, etc., with it and smashes them against the window. As the water level rises, the pressure increases until the window is completely under water. As in an avalanche, the pressure is all focused on the sash, which is held securely in the frame by the i.S. cam and prevents the water from getting in.

## SECURE WITH MACO i.S.

As a premium supplier and pioneer when it comes to burglar resistance, MACO is well aware of these forces and only uses the very best materials, advanced manufacturing process and a unique system concept for RC 1, RC 2 and RC 3 that enables a broad application with minimal hassle. MACO's security products guarantee manufacturers globally tested functional and application security up to RC 3 and therefore the best possible burglar resistance for your customers.







LÖWE Fenster: Success through quality, a local focus and individuality

**Satisfied customers** are always  
the best form of advertising





■ LÖWE Fenster achieved significant growth over the last few years.



**Total customer focus, the highest levels of quality and reliable partners; that is the recipe for success of LÖWE Fenster Löffler GmbH in Lower Franconia. LÖWE has been manufacturing windows and front doors of the highest technical standards for 85 years. The right hardware solution is an important aspect of these quality products. That is why they have used premium hardware from MACO since 1999.**

**FOCUS ON CUSTOMER SATISFACTION**

“We have always aimed for customers to be delighted and won over by our windows and doors, not just immediately after the units have been fitted, but for many years to come. If the customer is happy, word gets around,” says owner Leo Löffler of his window manufacturing company LÖWE Fenster's concept for success. In addition to hard work, high quality standards and a constant flow of

new ideas, LÖWE also particularly relies on dependable, skilful partners. And that is exactly what they have: For 16 years, they have relied on branded hardware from MACO. The company already has a partnership lasting almost 30 years with the profile manufacturer Veka.

**85 YEARS OF SUCCESS**

LÖWE has been manufacturing windows and front doors of the highest technical standards since 1930. Initially, the units were made from timber, but since 1970 they have exclusively used PVC profiles. Production was originally based in Elsenfeld but due to rapid growth, a move was unavoidable. In 1970, therefore, production was partly moved to Kleinwallstadt near Aschaffenburg and completed in 1974. Conditions there were ideal for adjusting production to meet the increasing demand. In addition, the company has a sales office in Rödermark with a display space of around 300 m<sup>2</sup>.





### Leo Löffler:

"Many enthusiastic customers have contributed to the fact that the LÖWE window brand enjoys an outstanding reputation in the region. Naturally we are doing everything to ensure that it stays this way in the future."

### Oliver Borho:

"LÖWE Fenster is a strong partner that is open to innovation and would like to continue to grow with us. The new rebate ventilators have expanded our hardware know-how."

Partnership for success: Leo Löffler (left) and MACO Sales Director Oliver Borho.

Leo Löffler joined the family company in 1984 and is now leading the window manufacturing company into its third generation. At the end of July, there will be a celebration in Kleinwallstadt with 500 guests for the company's 85th anniversary. "On the last day in July, the focus will not just be on the company's anniversary. We also want to use this open day to show our guests the extended facilities and the newly purchased machines and processing centres in production," reports Leo Löffler.

### REGIONAL BUYERS

LÖWE Fenster has successfully established itself in the region as 'the' provider of windows and doors. The company can count more than 25,000 satisfied customers in a 100-kilometre radius around the site. Around 70 per cent of these customers are private house builders. "And these customers want LÖWE windows," says the owner proudly.

### INDIVIDUAL & FAST

In order to satisfy increasing demand, production in Kleinwallstadt is being constantly

perfected. Between 40 and 100 windows are produced every day. This makes every window practically unique, as there are always differences in size or fittings. LÖWE Fenster only has 14 installers who fit the windows at the customer's location. Even oversize window units or casement doors are delivered in their own vehicles. A crane on the truck can lift the units to upper floors.

### IN THE BEST HANDS

The company currently employs a total of 74 people. Ten employees are responsible for customer service, four in-house and in the display areas and six who travel to customers to find the right solution on-site and take measurements.

"Right from the start, the customer should feel that they are in good hands. The first impression is really important. Our field sales employees travel to the customer with full sample cases and clean vehicles. They convey skill; high quality standards are far more than just the actual product," explains Leo Löffler.



The field sales team uses these sample cases when advising customers.

### THE LION AS A TRADEMARK

A presence across various media contributes to good brand recognition. Regular spots on local radio and TV are part of this, as well as advertising in magazines or hoardings at key points in the surrounding towns and cities. The lion, the supplier's trademark, has a high recognition value. Advertising online has increased over recent years. "But however important a media presence is: Real enthusiasm for windows and



It takes just two minutes to install the turn&tilt hardware.



doors can only be created when customers actually see and operate windows. Without our attractive display areas in Kleinwallstadt and Rödermark, we would not be able to achieve this," says the boss. Anyone who is interested can visit the display area seven days a week between 0600 hrs and 2200 hrs.

## HARDWARE SOLUTIONS AS A COMPETITIVE ADVANTAGE

"Many customers are often always pleasantly surprised by how easy it is to open and close our windows and casement doors. Naturally we point out that this is due to MACO's high-quality hardware. We show them detailed solutions such as the mushroom heads with movable bushes. These bushes ensure that there is less rubbing and makes the windows particularly easy to operate (see article on page 14/15). At this point, we also like to show them the hardware's window regulators, fitted as standard. It is these sophisticated details that make the difference and give us the competitive advantage we need," says Leo Löffler.

## SECURITY

LÖWE's customers are looking for high quality and security at a reasonable price. The window manufacturer can offer this, as even the standard version of the windows, normally triple-glazed, with the turn&tilt hardware from MACO, have a burglary-resistance

grade of RC 1 N. LÖWE Fenster documents the components' properties in their own test certificate that was issued last year by the Rosenheim Institute for Window Technology. For customers who have high security requirements, LÖWE offers class RC 2 N windows.

## HIGH-QUALITY VENTILATION TYPES

Leo Löffler exclusively trusts MACO products for its hardware. In addition to the turn&tilt, they also use sliding door hardware and front door locks. Since March, LÖWE Fenster has also been successfully using MACO window rebate ventilators. "This permanent ventilation is a small detail that makes a big difference: The air circulation effectively prevents mould formation in rooms. The display area offers the perfect way to demonstrate how this unobtrusive product works. Almost everyone who sees it wants a rebate ventilator for their windows," explains the LÖWE boss.

To install the ventilator in the sash, the company has purchased a punch that creates the space in the seal in just one step so that the ventilator can be fitted in a few minutes and attached with two screws. While builders were convinced by the product from the beginning, many private customers wanted to see it for themselves first. That way, they

can get an exact idea of the benefits that a rebate ventilator or other features can offer them.

## SUCCESSFUL PARTNERSHIP

"We are thrilled to be working with such a partner that is as committed as LÖWE Fenster; they market our products very successfully and actively help us introduce a new product such as the rebate ventilator onto the market," says MACO Sales Director Oliver Borho, who has been looking after customers for many years. "Over the years, we have developed a real relationship of trust. With our expert know-how, we can offer LÖWE comprehensive support when, for example, they need a customised window solution or when manufacturing processes need to be optimised. It goes without saying that a partner can always rely upon us at MACO.

[www.loewe-fenster.de](http://www.loewe-fenster.de)



MACO window rebate ventilators have been part of the LÖWE Fenster range since March.



Leo Löffler shows how the punch works that creates the gap in the seal for the installation of the rebate ventilator.



The punch works on two seals in just one step.



March saw the completion of the Rödermark site extension. There is now a new, 300 m² product display area.





i+R Fensterbau:  
Advanced production & customised window solutions

The strategy is about **synergy**  
**and partnership**







For over 20 years, i+R has trusted MACO's hardware solutions: Thorsten Hölzlsauer, CEO at i+R Fensterbau (left), with MACO field sales employee Philipp Steger.

The Vorarlberg family company i+R Fensterbau has been manufacturing timber windows and doors of the highest quality for more than 50 years. Know-how, decades of experience, strong business partners such as MACO and the latest technology are the basis of their success, but their integration into the i+R company group will also bring advantages.

The new i+R Fensterbau production facility in Lauterach, built in 2010, is a true model of its kind: The most high-tech CNC equipment in Austria, sophisticated manufacturing technology and the latest robotic technology all come together in the company's own painting facility. They guarantee the highest levels of precision and maximum flexibility for customised solutions or large orders needed at short notice. The range offered by i+R Fensterbau includes almost 40 different types of windows and doors, creating one of the largest product families in Europe.

### ALL-ROUND TALENT

Founded in 1904 as a carpentry and joinery workshop, what is now the i+R Group has become an all-round supplier to the housing and commercial building industry. Since 2013, the subsidiaries i+R Bau, i+R Wohnbau, i+R Industrie- und Gewerbebau, i+R Holzbau, i+R Fensterbau and Huppenkothener Baumaschinen GmbH have all operated under the umbrella of i+R Gruppe GmbH.

This means that the company group covers a wide spectrum: From the development of new construction projects to the construction of the properties and through to the manufacture of the windows needed for them, i+R is always the company to contact. "Our extensive portfolio means





Timber is i+R Fensterbau's most important material. A large timber depot storing all the standard types of timber guarantees constant availability of sufficient quantities and the best quality, even for large orders received at short notice.



Since 2010, i+R Fensterbau has been located in the north of Lauterach. The company, part of the i+R Group, currently employs around 40 employees.

that the future is looking very bright. For many projects, i+R is simultaneously the property developer, general contractor, construction manager, etc. This creates synergies and full order books," says Thorsten Hölzlsauer, Managing Director at i+R Fensterbau.

### PERFECTION IN FORM AND FUNCTION

i+R Fensterbau manufactures between 5000 and 7000 windows and casement doors every year for use in residential, industrial and commercial building or in public buildings. To set themselves apart from the competition, i+R focuses on quality, variety and a broad portfolio. They don't just design and manufacture windows, they also assemble and install them on-site. "Functionally perfect, ecologically sound and aesthetically appealing; those are the standards for our windows and doors," summarises the young company boss.

The specifications for windows and doors have risen sharply in many ways over the last few years: "Building owners and architects demand more formal flexibility. Windows and doors

have to meet the highest energy efficiency demands and expectations have also risen with regard to durability," says the native Vorarlberger. It is no wonder therefore that 90 per cent of the windows are triple-glazed, in order to meet the demand for energy efficiency.

Requests for flexibility are reflected in the renovation and purchase of machines that are aiming for individuality rather than performance. Large-scale units in particular are becoming increasingly popular. "In detached houses, L&S units have become the standard. Even in residential buildings, at least in the more expensive ones, they are now essential," explains the enthusiastic sportsman. In addition, a new machine has made it possible to manufacture a reversible rebate that is not often seen on the market due to the difficulty of producing it.

### EMPLOYEES & APPRENTICES

For Thorsten Hölzlsauer, flat hierarchies and quick decisions are what characterise working in the family company i+R. "This structure has offered me lots of opportunities and I have been able

to actively shape my career path. This would have definitely have been more difficult in a larger company," he says. 40 employees, most of whom are very young, work at i+R Fensterbau. "It is often easier for young people to get to grips with a high-tech company that works a lot with CNC machines," says the company boss, who is still young himself.

Great importance is attached to training specialist workers: Every year, at least one apprentice is taken on. They are trained as a carpenter or carpentry technician. The whole group currently employs around 57 apprentices. More than 50 per cent of the apprentices stay on after their apprenticeship in the company that has received multiple awards for their high-quality training. In total, the i+R Group forms a strong team of 700 employees.

### STRONG PARTNERS

Strong suppliers and partners also contribute to high levels of quality and customisation for windows and doors. When it comes to hardware, i+R has trusted in MACO products for more than 20 years and converted to the whole hardware range two years ago.





Advanced production technology and automated installations processes are carried out by hand by well-trained installers.



The new four-layer paint contributes substantially to the unit's exceptional durability. In addition, windows and doors can be painted in any colour, opening up manifold design options for architects and building owners.



Prior to the painting process, any damage to the timber is rectified or glue residue is removed so that the surface is as smooth as possible.

"Flawless function and, naturally, the price are key factors for hardware. MACO wins on both. I value the reliability, the good advice and the equal partnership," says Hölzlauer. MACO field sales employee Philipp Steger is also enthusiastic about the long-term partnership: "i+R is one of our most important business partners. It is therefore all the more important to me that I can meet their wishes and requirements with existing and newly developed hardware solutions."

### SECURITY & INDIVIDUALITY

One of i+R Fensterbau's specialisations is the issue of security. By building very large, 2-sashed and triple-glazed window units with sashes measuring up to 1 m x 2.65 m with a resistance class of RC 3, the company clearly stands out in the Vorarlberg window market. "Our RC 3 windows have already been installed in several construction projects such as a high-end villa in Liechtenstein and a luxury hotel in Austria," says the young father proudly. He goes on to say: "In future, we want to focus more on the RC 3 market niche and position ourselves as experts in security." To do this, the company

also uses the know-how of their hardware supplier MACO, who are amongst the leaders in mechanical burglar resistance.

For customised designs, i+R also relies on the knowledge of the hardware professionals. For example, for double windows, which are often used in historical buildings, customised hardware solutions were requested: For these, special MACO-TRICOAT-PLUS hardware components were produced in white and black. "I really value this flexibility in our hardware partner. Together we develop more and more customised solutions for end customers and thus set trends in the industry," says Hölzlauer confidently.

### SURFACE FINISH AS USP

The Vorarlberg company wants to use their special surface treatments to differentiate themselves from the competition and expanded their machinery accordingly: The latest generation of spray robots produce a special four-layer paint that can be relied upon to deliver the very best in surface quality and durability. As a result, the paint layer is applied much more consistently. The in-house, fully

automated paint facility reduces the window and door construction lead time to between three and five weeks.

### CUSTOMERS & SALES

Around 35 per cent of the windows manufactured are timber and aluminium and another 45 per cent are timber systems. "In our Austrian market, our radius is around 100 kilometres. We are also active in Switzerland, France, Germany, Hungary and even Canada," he explains. Around half of orders come from their own company group and the other half is made up of enquiries from the market. Our customers include not only building owners planning detached houses but also hotel owners, residential building companies, industrial companies and architects.

### FOCUS ON SUSTAINABILITY

In a timber-processing company, sustainability naturally plays an important role and is implemented in all processes. Timber is only procured from sustainable forest management. Waste timber is reused for heat. In-house photovoltaic equipment produces green electricity. i+R meet the high quality and environmental standards that

they set, documenting their quality management and their contribution to environmental protection with recognised certifications.

The trend in sustainability can be seen in the high energy standards required in residential building. "Increasingly, invitations to tender demand passive house standards or ecological certifications," explains the Managing Director. "Our products have to meet this trend, and we want them to." The company group has also recognised this and in 2008, expanded their portfolio with geo-thermal heating. Advising customers on alternative heat generation and planning and implementing appropriate measures is now part of i+R's scope.

[www.ir-fensterbau.at](http://www.ir-fensterbau.at)



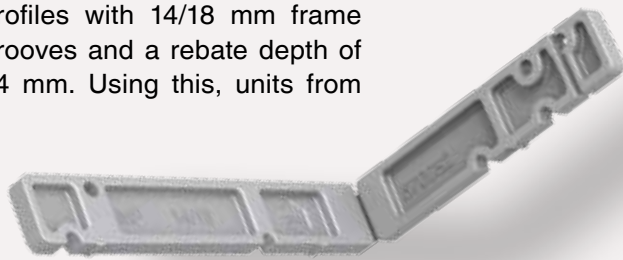
MULTI POWER for aluminium windows

## New spacer bar and a clean design

Making aluminium windows with non-visible hardware components? This is now possible, thanks to the new spacer bars for aluminium profiles in the fully concealed MULTI POWER hinge-side.

The spacer bar for corner and scissor stay hinges is suitable for profiles with 14/18 mm frame grooves and a rebate depth of 24 mm. Using this, units from

manufacturers such as Aluprof, Alumil, Aliplast, Bauxal, Blyweert, Cortizo 3500, Feal T85, Ponzio PE60 and PE68 and Yawal can now be fitted with concealed MACO hardware. Design enthusiasts will love the continuous frame profile on aluminium windows and casement doors.



Adapted to Veka profiles

## High-quality striker plates with a fresh look

To fit the Veka profiles Softline and Topline without Eurogroove, MACO has redesigned the individual striker plates and single piece door strikers in the Z-TS, G-TZ, Z-TF and Z-TA door lock versions. PVC connectors ensure a perfect fit with the profile.

There is also an additional, 44 mm-wide striker plate version on the market which can be firmly screwed into the reinforcement even when using offset reinforced iron. This is also available with reduced clamping pressure.

The striker plates in the Z-TS and Z-TA door locks now have a latch sliding tab so that they are compatible with standard electric openers. It is really simple to adjust the clamping pressure using a 4 mm hex screwdriver.

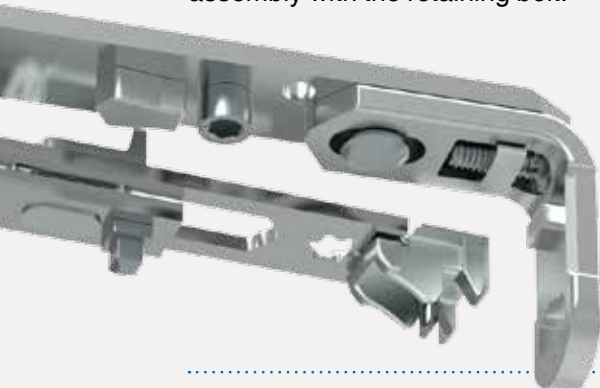


Mounting bracket for scissor stay and turn-only hinges locked

## Security is our top priority

As a premium hardware manufacturer, MACO wants to constantly improve their level of quality. In addition, the issue of security is a driving force behind new products and developments. With this in mind, the mounting bracket for the scissor stay and turn-only hinges on the turn-only or turn&tilt hardware MULTI-MATIC and MULTI-TREND was locked by joining it to the sub-assembly with the retaining bolt.

The mounting bracket is a central, load-bearing component that joins the sash with the scissor stay hinge via the rebated scissor stay support arm. It holds the sash upright in the frame. The quality and security of this component are therefore essential. The riveted steering plate for the side adjustment already reliably prevented the mounting bracket and scissor stay arm from separating. By locking the mounting bracket, this security feature is doubled. MACO thus takes another step towards a window with all-round security.



Three new country-specific MACO websites

## Contemporary online presence

Since October, the first MACO markets have had an online presence customised for the relevant country: Austria ([www.maco.at](http://www.maco.at)), Germany ([www.maco.de](http://www.maco.de)) and Russia ([www.maco.ru](http://www.maco.ru)). These country-specific websites enable us to cover different market conditions better and to adjust the content accordingly. Products can be launched in a way that is right for the market or advertising campaigns can be targeted towards just one country. Customers quickly receive information that is relevant for their market and makes the most of the advantages.

All MACO Group news can now be found in German and English on [www.maco.eu](http://www.maco.eu). With a responsive web design, the new websites are suitable for various screen sizes as well as mobile devices (phone, tablet). Great value was placed on making the site intuitive and user-friendly with a clear, modern design. Naturally, the website's content is always up-to-date.



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