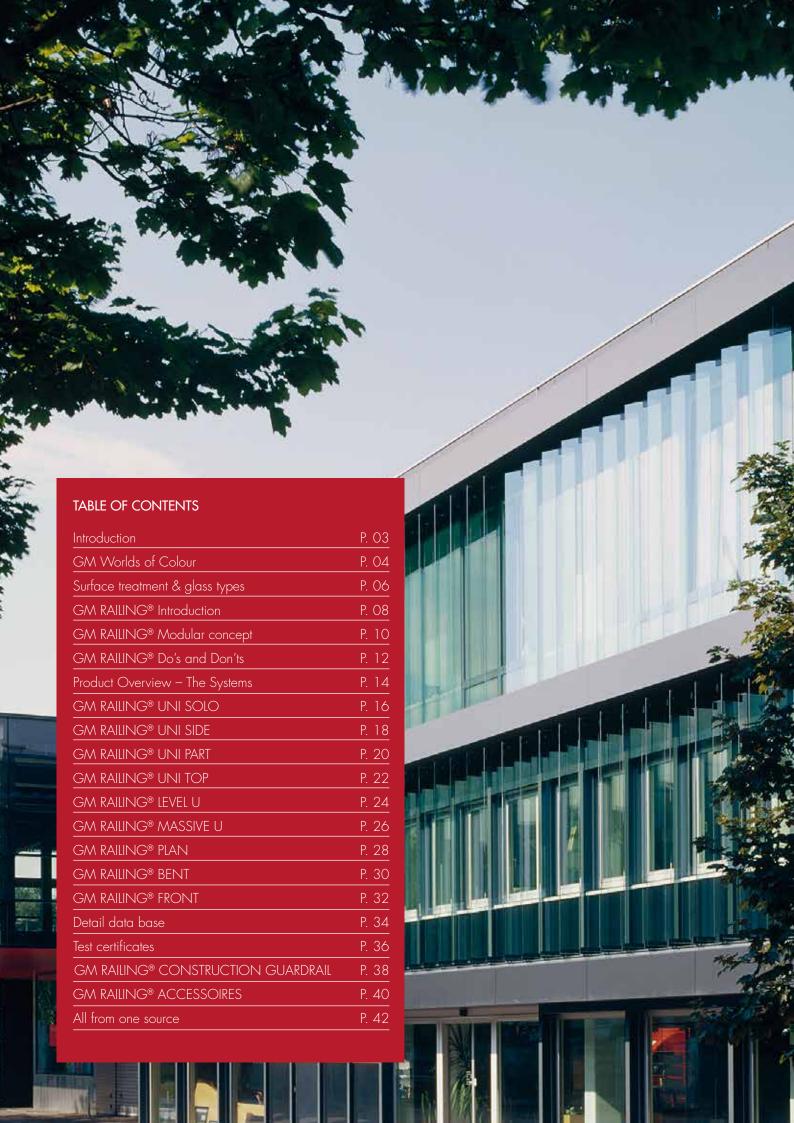
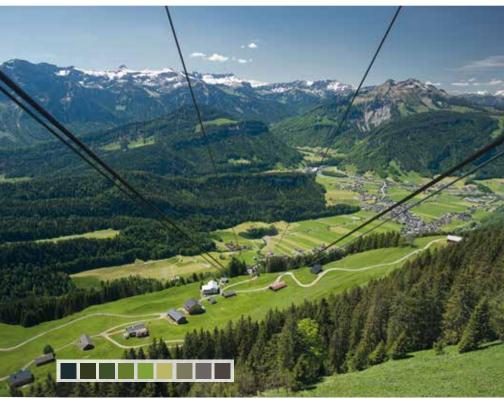
# glasmarte















# **GM WORLDS OF COLOUR EXPRESSIVE DESIGN**

Colour has an impact. A cool blue, a warm red or rather a fresh green – the choice of colour is of central importance in interior design. It essentially determines the atmosphere. Whether outside or inside, glass can be used to create permanent accents of colour. Quite discreet or powerfully luminous. Entire expanses, partial surfaces or with individual patterns. Glas Marte supplies hundreds of shades, applied by screen or roller printing or incorporated by way of coloured laminated glass films.

Be inspired by the wide range of colours!





# **SURFACE TREATMENT UNIQUE EFFECT**

Glass can be ultra-smooth But it doesn't have to be. Glass Marte developed and refined various surface treatment options ranging from complex sandblasting to several types of printing to the production of to textured glass to the incorporation of the finest embroideries within the glass.

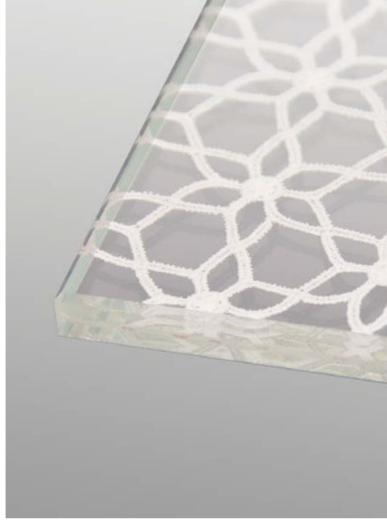
When it comes to GM ICE-H $^{\otimes}$ , for example, glass material is detached from the surface, which leaves an interesting, uniquely broken surface structure with a cool, vibrant appearance. Translucent and reflective at the same time, the GM LAMIMARTEX® Collection, where textile and glass merge into one.



# **GLASS TYPES SAFETY TESTED**

Place and purpose determine the type of glass used. As a processor and manufacturer, Glas Marte offers a wide range of glass types for this purpose: tempered, laminated and insulating glass from our own, controlled manufacturing as well as mirrors, ornamental glass, scratch resistant or shower glass to name but a few.

As a customer you benefit not only from our many years of experience but also from the short distances between competent advice, ultra-modern production and proper delivery, which Glas Marte guarantees as a full-range supplier.



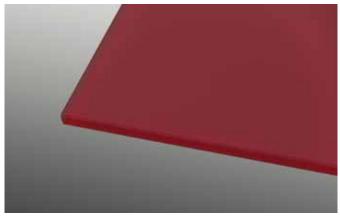
**GM LAMIMARTEX®** 



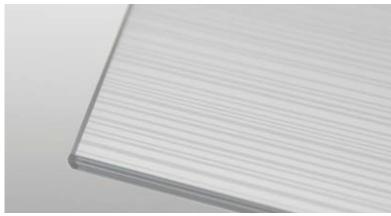
GM SATINATO®



GM SATINATO® FLOWER



GM TEMPERED GLASS COLORMART®



GM SATINATO® STRAIGHT



### **GM RAILING®**

#### THE MECHANICALLY PERFECT MODULAR SOLUTIONS

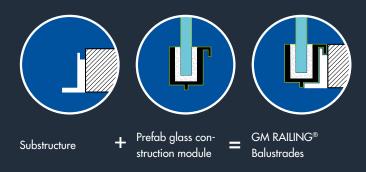
As a building material and design element, glass has long been a solid architectural fixture. However, glass balustrades are still a challenge for every planner, architect or structural engineer – not to mention their construction and assembly. GM RAILING® has developed a perfect technical modular solution for these special requirements.

GM RAILING® impresses with its versatile application possibilities. Based on five basic systems – UNI, LEVEL U, MASSIVE U, PLAN, BENT and FRONT — we can provide a variety of solutions to fulfil nearly all requirements. GM Engineering will be pleased to assist you in the implementation of more sophisticated special solutions.

#### THE MODULAR CONCEPT

GM RAILING® glass balustrades consist of a prefabricated glass construction module (glass + profile are firmly connected to each other at the factory and optimally supported) and a substructure perfectly matched to the construction.

Assembly can be ideally integrated into a construction schedule due to the delivery of the glass construction module (glass + profile in a prefab module). The installation of the glass itself usually only takes place during the course of the completion work. The glass and all visible surfaces are therefore optimally protected against soiling and damage caused by the construction work in the final phase of the project.







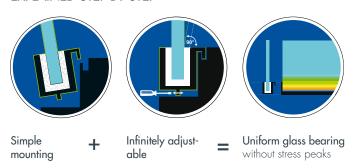
# **ASSEMBLY IN 2 STEPS**

## EASY AND FAST

GM RAILING® balustrade systems allow for linear bearings without the need for vertical columns due to prefabricated glass construction modules in conjunction with a substructure profile and a continuous handrail.

The prefabricated glass construction modules are mounted in the substructure profiles, which are to be installed on-site, and screwed together using cylinder screws or special spacers. This screw connection allows for tolerance compensation of the vertical position at rail height. Due to the fixing in the mounting rail, no glass drillings are necessary. This reduces planning and assembly effort as well as costs. Systematisation can generate benefits across all areas.

#### **EXPLAINED STEP BY STEP**















# STANDARD-COMPLIANT DESIGN

# OF GLASS BALUSTRADES



# DO'S



#### PRESSURE-FREE INSTALLATION

Low constraint storage DIN 18008-1 - 10.1.3 ÖN B 3716-1 - 6.2 SIGAB 002 - 5.3



# DON'TS



Forced strain due to installation Wedges must not be used

(local stresses)



#### UNCHANGEABLE

### POSITION STABILITY

Position stability through destabilising effects

EN 1990



#### CHANGE THROUGH USE

Non rectifiable serviceability limit state due to e.g. dirt (gravel ...)

Indirect effects from ice, snow and wetness influence storage conditions  $\,$ 

Environmental influences with effect on the durability of the supporting structure



#### **UNEXPECTED STRAINS**

Avoidance of influences from the substructure on the glass railing, e.g. deformations DIN 18008-1 – 3.1.1 and 7.1.5 I  $\ddot{\text{O}}$  N B 3716-1 – 1



Substructure may negatively influence

the glass statics

Our interpretation of standards and technical guidelines; This list does not claim to be exhaustive.

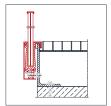




# PRODUCT OVERVIEW

# GM RAILING® - THE SYSTEMS

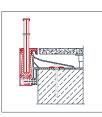
UNIVERSAL	from Page 16	GM RAILING® UNI THE UNIVERSAL SOLUTION The GM RAILING® UNI system can be easily integrated into a wide variety of constructions thanks to the consistent modular structure of the various variants, giving planners a unique freedom of design.
IN THE GROUND	from Page 24	GM RAILING® LEVEL U FOR INSTALLATION WITH EXPOSED CONCRETE The GM RAILING® LEVEL U system is designed for applications in which the mounting unit for the glass railing is recessed in the floor surface – concrete. Only the relevant base and protruding glass itself are to be seen.
LATERAL/ ON TOP	from Page 26	GM RAILING® MASSIVE U FOR INDIVIDUAL PLANNING DETAILS GM RAILING® MASSIVE U is a glass railing designed for installations where the construction is no longer accessible from the side. The profile can be attached to a solid structure from above as well as from the side.
FLUSH- MOUNTED	from Page 28	GM RAILING® PLAN FOR HIGHEST ARCHITECTURAL NEEDS The GM RAILING® PLAN fastening concept is a railing fastening that uses clear and direct architectural vocabulary. It impresses due to its flush-mounting and is refined in its details. Glass is the only thing visible, without fail.
BENT	from Page 30	GM RAILING® BENT FOR BENT GLASS BALUSTRADES The greatest advantage of the GM RAILING® BENT system is the systematisation of fastening and storage. The glass base, which is manufactured to the highest quality and remains consistent over all radii and bending shapes, permits systematic statics.
attika Inside	from Page 32	GM RAILING® FRONT FOR TRANSPARENT RAISING OF THE BALUSTRADE GM RAILING® FRONT is designed for lateral mounting on the side facing the viewer, in a solid brick foundation or low wall above the cornice of a classical façade.







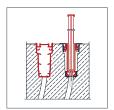
GM RAILING® UNI SIDE



GM RAILING $^{\circ}$  UNI PART



GM RAILING® UNI TOP



GM RAILING® LEVEL U



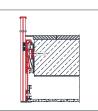
GM RAILING® MASSIVE UT



GM RAILING® MASSIVE US



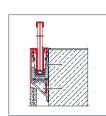
GM RAILING® PLAN 1



GM RAILING® PLAN 2



GM RAILING® BENT TOP

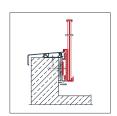


GM RAILING® BENT SIDE

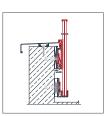


GM RAILING® BENT MASSIVE TOP GM RAILING® BENT MASSIVE SIDE





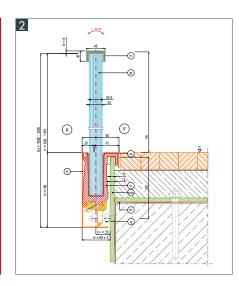
GM RAILING® FRONT AIO



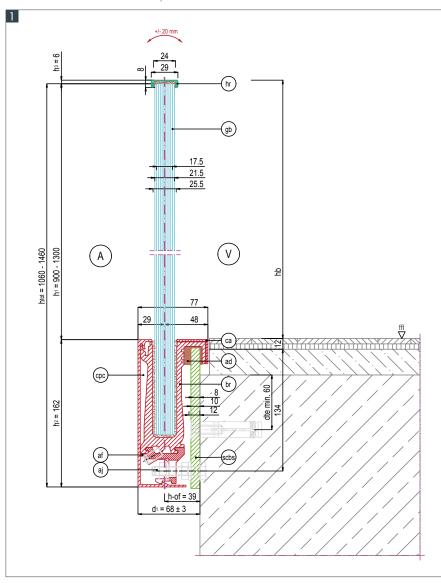
GM RAILING® FRONT AIT



- » Suspension profile is mounted onto on-site steel construction
- » Cost-effective application with many different solutions
- » Vertical position infinitely adjustable
- » AbP P-2018-3064



1. GM RAILING® UNI SOLO 20 | 2. GM RAILING® UNI SOLO 30

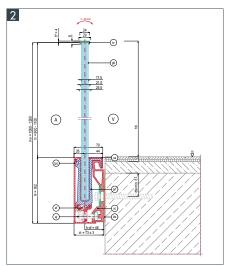




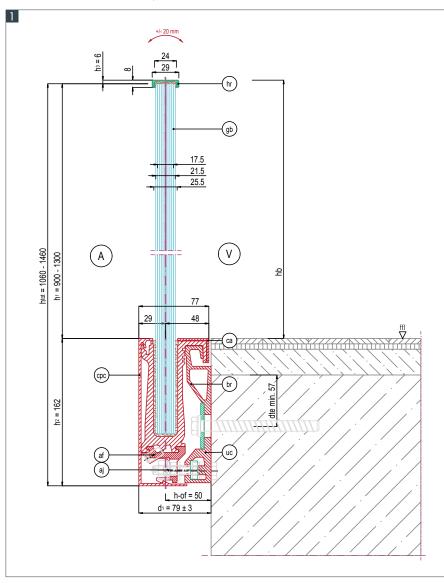




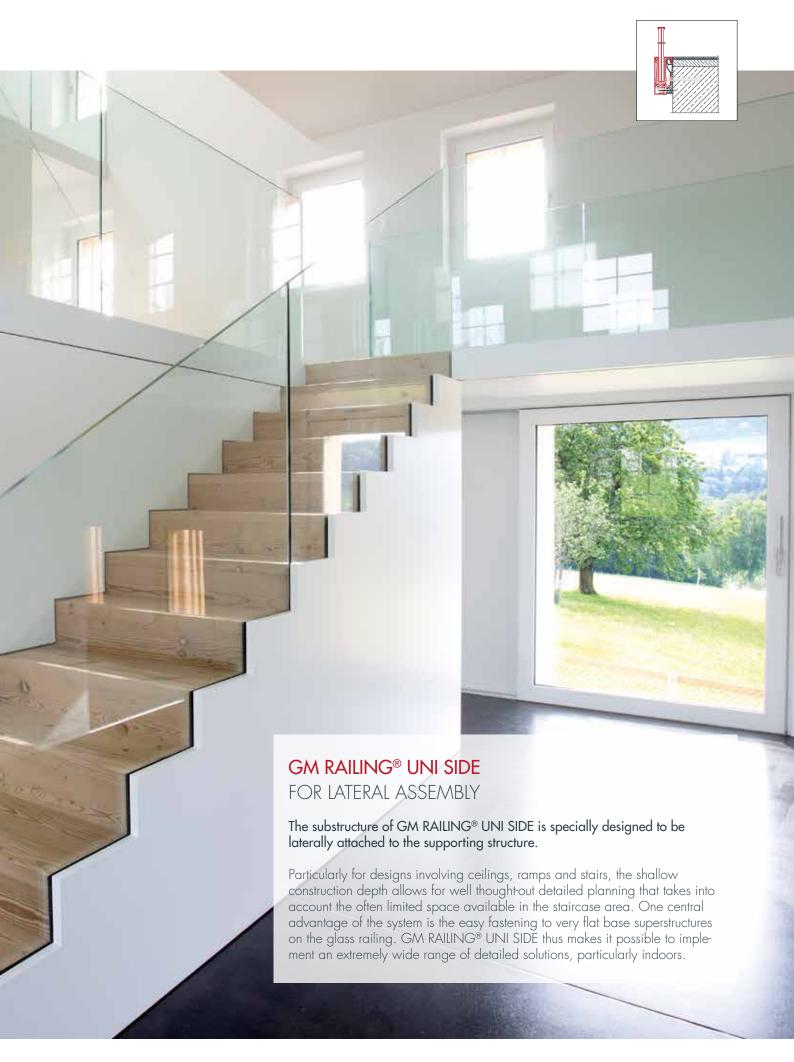
- » Low construction depth, particularly effective even in staircase and ramp areas
- » Versatile fastening possibilities
- » Vertical position infinitely adjustable
- » AbP P-2018-3064



1. GM RAILING® UNI SIDE 20 | 2. GM RAILING® UNI SIDE 16

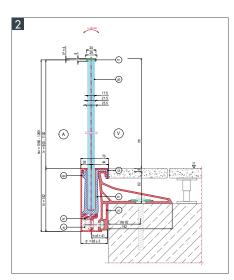




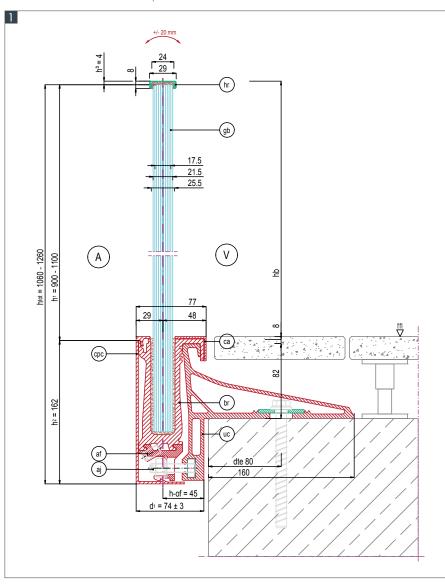




- » For mounting at the component edge
- » Penetration-resistant roof sealing with excellent thermal insulation
- » Construction can be used irrespective of the building situation
- » Vertical position infinitely adjustable
- » AbP P-2018-3064



1. GM RAILING® UNI PART 20 | 2. GM RAILING® UNI PART 16

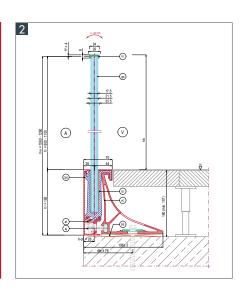




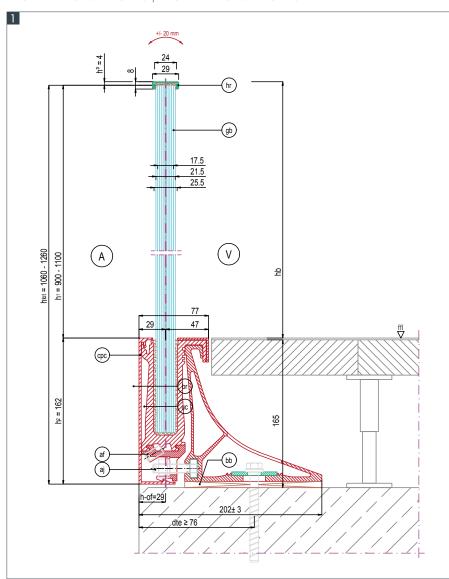




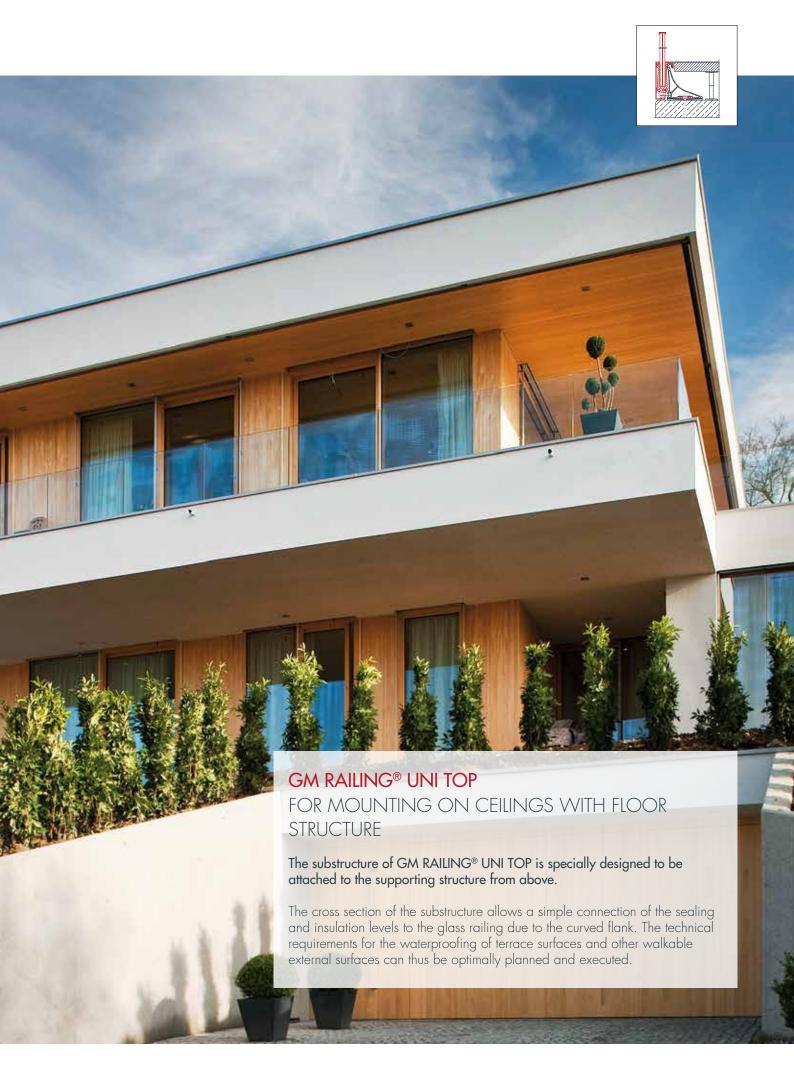
- » The substructure profile is both the border for floor construction or screed.
- » An integrally formed flange can be used as a support surface for a raised floor.
- » Vertical position infinitely adjustable
- » AbP P-2018-3064



1. GM RAILING® UNI TOP 20 | 2. GM RAILING® UNI TOP 16

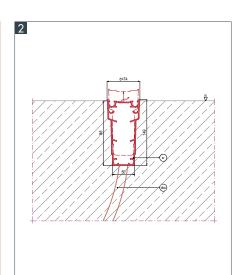




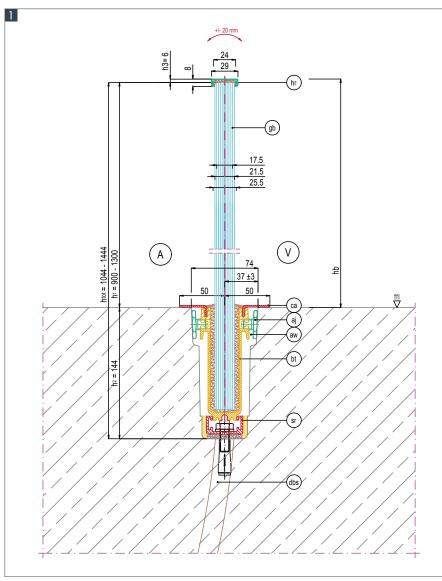




- » Mounting construction not visible
- » Assembly and adjustment of the glass construction module from above
- » Aesthetically extremely appealing, lightweight appearance
- » Exact concrete groove defines geometry
- » AbP A-15-014



1. GM RAILING® LEVEL U | 2. GM RAILING® LEVEL U FORMWORK PROFILE

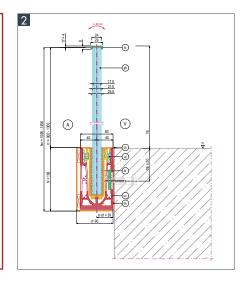




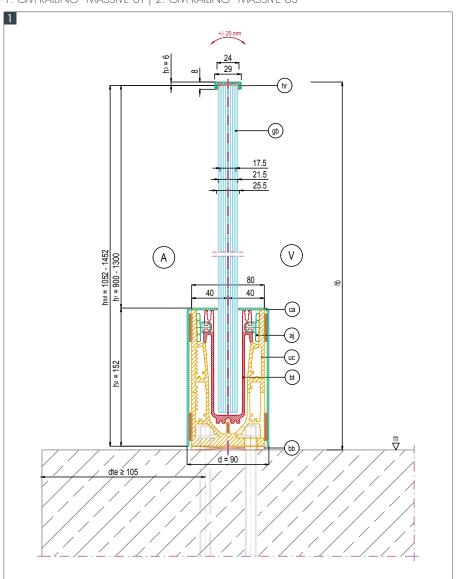




- » Suitable for a wide range of installation situations
- » Assembly and adjustment of the glass construction module from above
- » Clear geometrical shape
- » AbP A-15-014



1. GM RAILING® MASSIVE UT | 2. GM RAILING® MASSIVE US

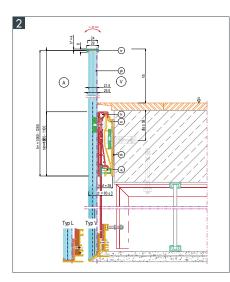




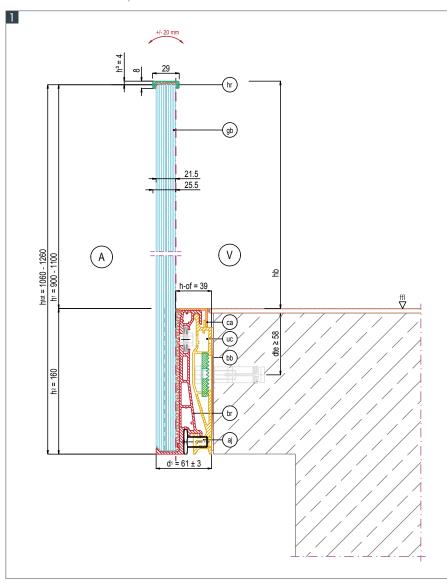




- » Clear architectural language
- » Only the whole glass is visible without substructure profiles
- » Can also be used for very high, suspended ceiling constructions.
- » Flush connections possible



1. GM RAILING® PLAN 1 | 2. GM RAILING® PLAN 2

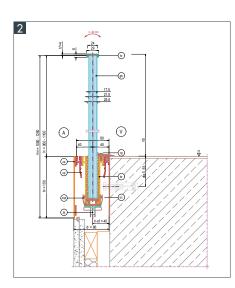




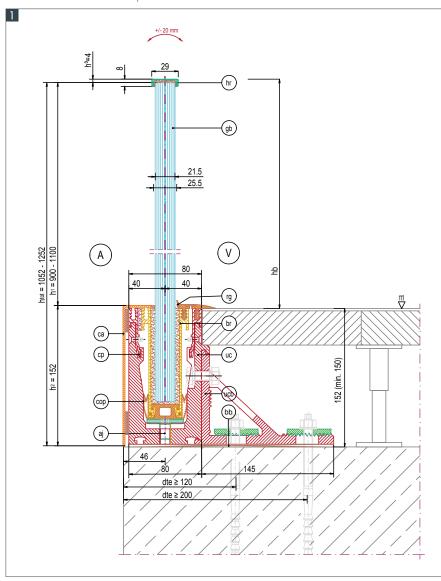




- » Simple mountable substructure.
- » Only the glass is bent, construction and bearing profiles adapt to the glass and enable optimum glass bedding.
- » Convex, concave, regular and free bending shapes possible
- » Excellent tolerance compensation
- » AbP A-12-013/AbP A-13-021



1. GM RAILING® BENT MT | 2. GM RAILING® BENT MS

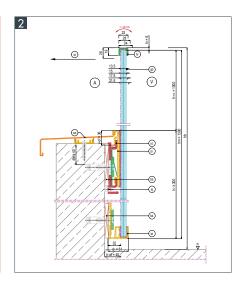




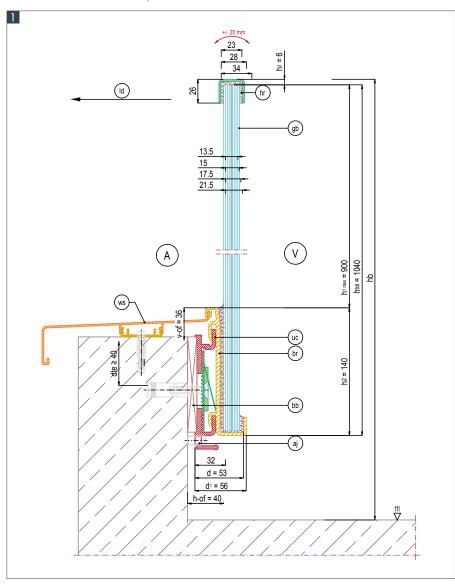




- » Especially for low walls above the cornice of a classical façade and brick benches
- » Only the whole glass is visible without substructure profiles
- » AbP A-15-001/AbP A-13-017



1. GM RAILING® FRONT AIO | 2. GM RAILING® FRONT AIT







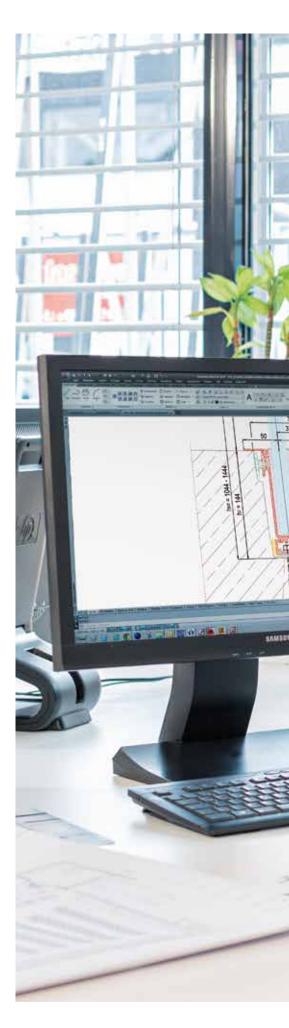
# **DETAIL DATA BASE**CUMULATIVE KNOW-HOW

The many years of experience of our versed glass construction technicians is the basis for object-related detail solutions which have contributed significantly to the successful realisation of a wide variety of properties, from detached houses to impressive corporate headquarters. You too can benefit from this wealth of experience and learn more connection details and design options of GM RAILING® systems via our extensive GM RAILING® database.

Do you need individual support for special design tasks? Our specialists will be happy to assist you with the creation of the required special solutions. In cooperation with our own development department, we leave no stone unturned when ensuring your planning task is solved to your satisfaction, taking technical and economic aspects into account.

We passionately strive to live up to our position as a spearhead in terms of technological prowess and expertise.

DETAILS AVAILABLE AS DWG, DXF OR PDF FILE AT: EPAPER.GLASMARTE.AT





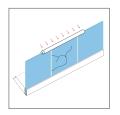
### **GM RAILING® TEST CERTIFICATES**

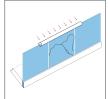
# PATENTED, TESTED 100-FOLD, INTERNATIONALLY ACCEPTED

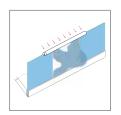
According to DIN 18008-4 - 6.1, the effects of damage to any parapet element (including the failure of end plates) must be proven. In case of failure of a parapet element, especially in the interaction of handrail and broken glass, this can best be demonstrated by experiments.

Depending on the glass choice (VSG from 2x tempered safety glass or VSG 2x TVG or VSG 2x float glass) and film thickness, the results of breakage tests may vary drastically. The broken glass partially has a residual stability or residual supporting properties. Depending on the type of glass, this can have a positive or negative impact on the overall system. To date, no method is known to us, as to how the residual strength of broken glass can be conclusively demonstrated mathematically. For this reason, GM RAILING has performed hundreds of glass breakage tests with original components up to a single length of 4 m.

In addition, we have static verifications for all series and a very large pool of permits for special situations or requirements. GM RAILING® is also able to take your individual requirements into account thanks to a certified calculation program.







LAMINATED GLASS/ **FLOAT** 

LAMINATED/TVG

LAMINATED/ **TEMPERED** 

#### **TESTING LAB**

#### GM RAILING® GLASS BALUSTRADES HAVE BEEN SUBMITTED TO COUNTLESS TESTS.

Fracture resistance, stability, load-bearing capacity, residual stability are just a few of the many parameters that we constantly monitor and test in our test laboratory. We are able to do so, in addition to a high level of expertise, due to the appropriate equipment of various testing facilities.

In addition to the classic pendulum impact test, residual stability, fracture resistance, reaction to tensile and compressive loads and stability of brackets and suspension profiles are tested, recorded and logged with DKD-calibrated testing machines.

GM RAILING® is subjected to regular material and component tests by internal and external test centres.

#### GENERAL TEST CERTIFICATES ISSUED BY THE BUILDING AUTHORITIES **GM RAILING®**

GM RAILING® SERIES	TEST CERTIFICATE NO. OF THE RESPECTIVE TEST INSTITUTE	TEST TYPE
UNI	AbP P-2018-3064	Shock-like action – pendulum impact
MASSIVE/LEVEL	AbP A-15-014	Shock-like action – pendulum impact
FRONT AIO FRONT AIT	AbP A-15-001 AbP A-13-017	Shock-like action – pendulum impact Shock-like action – pendulum impact
BENT (VSG from TVG or ESG) BENT (VSG from Float)	AbP A-12-013 AbP A-13-021	Shock-like action – pendulum impact Shock-like action – pendulum impact

























# GM RAILING® CONSTRUCTION GUARD RAIL COMPREHENSIVE RANGE

# FOR ALL SYSTEMS

Glas Marte has developed a special construction guardrail for all GM RAILING® systems for the period between substructure and glass assembly. By using a temporary building solution, all dangerous work in the fall area is significantly reduced when installing glass to prevent falls.

The construction handrail is delivered to the construction site together. Over the course of assembling the glass modules, the auxiliary railing is dismantled and taken back by GM RAILING $^{\circ}$ .

A late glass module assembly is the best protection against damage during the construction period. This also prevents the glass railings from needing to be cleaned again.

#### Overview of the most important features

- » Substructure is assembled
- » Construction auxiliary railing is hooked in and screwed in place
- » All other trades can be completed in the meantime
- » Construction guardrail is dismantled
- » Glass railing is inserted







### **GM RAILING® ACCESSORIES**

GM RAILING® also offers additional products such as handrails and cover profiles in a wide range of designs and materials. Our development team is also happy to design individual special solutions.

#### **HANDRAILS**

GM RAILING® offers a wide range of handrail variants. In addition to ground or polished stainless steel profiles we also offer wooden sheathing in various shapes and types of wood. Corner connections ensure exact aligning.

As outlined in DIN 18008-4 - 6.1 - special proofs for category B glass parapets, GM RAILING® handrails are able to transfer the rail loads to neighbouring elements, end posts or anchoring to the building in the event of complete failure of a parapet element.

#### Product benefits:

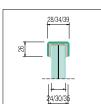
- » All verification according to DIN 18008-4 available.
- » Due to the optimum glass clamping in the lower area, the handrail is mounted on the upper glass edge without having to align it.

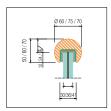


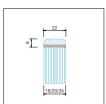


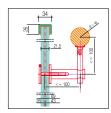












#### STAINLESS STEEL Available in Extralight, Light and Solid versions for all glass thicknesses

WOOD
For all glass thicknesses available in: Maple, birch, beech, oak, cherry, larch and nut (others on request)

GLAS
Glass edge protection
"GLASS STRIPE" made
of drawn transparent
borosilicate glass,
bonded in grey and
black

SUPERIOR

Can be used in combination with all glass thicknesses and series

HANDRAIL

#### **COVERING PROFILES**

GM RAILING® cover profiles guarantee a visually appealing finished design. There are no limits to the design. The covers are available as standard as aluminium clip profiles with a height of 160 to 280 mm in aluminium or stainless steel as edge profiles. Special solutions such as gypsum plaster-boards or mirrors are also available on request.

An inner metal edge has also been constructed at the transition to the floor covering in order to protect the floor from excessive moisture during wet cleaning.

#### Product benefits:

- » Simple mounting and dismantling of system components
- » Screw fastenings not visible
- » Numerous design advantages even when servicing is required





# GM RAILING® ALL FROM ONE SOURCE

- 1. Personal consultation | Order
- 2. Technical planning
- 3. Detailed planning by GM RAILING®
- 4. Approved plan by customer
- 5. Production, delivery by GM RAILING®
- 6. Assembly, material delivery, installation support

Comprehensive information about our glass railing systems such as brochures, tender texts, installation instructions and detailed solutions are available on our ePaper: epaper.glasmarte.at

Please also refer to the particularly easy-to-use planning manuals of the GM RAILING® UNI system. The shortest and cheapest way to go from an idea to an elegant glass balustrade.













