# **Sliding Shutters**

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# A variety of panels

- Sliding Shutters are available with a variety of infills. As standard there is a choice of louvre fins, perforated sheet or aluminium corrugated mesh
- The fins in the aluminium extruded frame are available in aluminium and Western Red Cedar wood, in various shapes and as fixed application
- The new InFinity Shutter has a concealed frame behind the louvres. Premium wood-look finishes provide a natural appearance without weathering or maintenance
- The perforated sheet shutter is frameless and comes in two perforations of 5% and 10% openness for good shading functionality. Custom perforations are also possible
- The Wavy Mesh shutter has a unique aluminium corrugated mesh with a striking anodization finish, providing a spectacular 3D appearance
- Sliding shutters can be manually operated or motorized with a 24V belt drive system
- Top and bottom rails, runners and hardware are an integral part of the system.



# The line up



SLIDING LOUVRE SHUTTER







INFINITY SHUTTER

PERFORATED SLIDING SHUTTER

WAVY MESH SLIDING SHUTTER

Het Funen Park Amsterdam, the Netherlands

> Morag Louvre Sliding Shutters are both highly functional and attractive as a dynamic facade element. They have a clean and crisp appearance and can provide full shading while still allowing a good view outside.

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# Key features

• Choice of six fin types in extruded aluminium and Western Red Cedar wood, as fixed elements

- Choice of two different frame types, from minimal design to strength for large dimensions
- Wide choice in finishes: from anodisation to powder coating in an unlimited variety of colours and designs
- Manual application or reliable motorisation to increase functionality
- Our guiding components are totally weather resistant and require minimum maintenance
- Elegant system design, with attractive details and all fixings hidden from view.



# Louvre Fins

Louvre shutters are typically configured as a frame built from extruded aluminium profiles with an array of fixed horizontal fins in extruded aluminium or wood. For the fins there is a choice of six types with different shapes and appearance. Fixed fins can be placed in the frame at a suitable angle and module to meet the requirements for shading and open view to the outside. For each fixed fin type there is a choice of three modules for a more closed, medium closed or more open configuration. A more closed fin configuration provides the best shading while a more open configuration allows the best outward view. Upon special request we could offer certain systems with movable fins.

Modules for fixed fins	Resulting shading angle		
Fintype	7°	20°	34°
Alu Rounded 60x10	47	57	70
Alu foil 70x15	60	70	84
Alu/Wood rhombold 68x16	53	65	81
Alu S 70x48	76	87	102
Alu Z 70x48	76	87	102

All fins are designed to span typical shutter widths of about 1 - 1.5 meter. However local wind load requirements amongst others dictate the maximum allowable fin span, which also varies per fin type.



Panel Span (mm)



**Fin Alu rounded 60x10** Fixed system Material: Aluminium



**Fin Alu foil 70x15** Fixed system Material: Aluminium



**Fin alu rhomboid 68x16** Fixed system Material: Aluminium



Fin WRC rhomboid 68x16 Fixed system Material: Western Red Cedar



**Fin Alu S 70x48** Fixed system Material: Aluminium



**Fin Alu Z 70x48** Fixed system Material: Aluminium

# Frames and Dimensions

Sliding Louvre Shutters were designed to withstand high wind loads at full floor heights. However the maximum dimension for a shutter will depend on the applied frame type and the maximum occurring wind load on the building. Wind loads typically dependent on the geographical location and building height. Three configurations are available for sliding louvre shutters. For each configuration the maximum shutter dimensions as a function of the maximum wind load can be found in below graphs.

**Slimline Frame with Fixed Fins** 

Shutter heights fixed fins, Slimline frame



Strongbox Frame with Fixed Fins





Shutter heights fixed fins, 60x40 frame



## Strongbox Frame with Adjustable Fins

Shutter heights adjustable fins, Strongbox frame





# Materials & Finishes



All aluminium profiles used in the Sliding Shutter system can be anodized in a natural silver colour or a range of alternative colours and shades. Anodisation is an electrolytic process that turns the top layer of the aluminium into a strong protective surface that is resistant to all conditions.

For an even wider choice of colours and designs the shutters can be powder coated in a wide range of RAL colours or to a specific colour requirement. Morag Global also offers the highest standard of sublimation finishes, providing the high protection of a durable powder coated finish with the superb look of wood and patinised metal designs.

As for the real wood fins: Western Red Cedar can be used without finish in outside conditions, resulting in a silver grey tone that will retain its look for many years without maintenance. Alternatively the wood fins can be provided with a transparent nano coating that with regular maintenance will preserve the original red brown appearance.

#### Residential Rottekade, Hillegersberg, Rotterdam, the Netherlands

Architect : Van der Leur Vermeer Architecten Product : Sliding Louvre Shutter 10



InFinity Sliding Shutters are a contemporary addition to the Morag range of louvre shutters. Placing the fins in front of the shutters creates a different appearance of endless lines, uninterrupted by vertical frames. The crisp design can be further accentuated by our special design finishes.

# Key features

- Rectangular profiles running over full width of shutter, hiding frame from view
- Clean and crisp design without any visible fixings
- All profiles in aluminium for maintenance free durability and stability
- Excellent wood-look finishes for warm and natural appearance without weathering.







# Frame Profiles

InFinity Shutters use a set of specially designed frame profiles allowing invisible fixing of the louvre fins to the front of the shutter. The frame itself also does not show any fixings. Aluminium end caps fitted to each louvre and frame profile complete the elegant design detail.

#### **Maximum Dimensions**

The InFinity Shutter is designed for application at full floor heights. However the maximum dimension of a shutter will depend on the maximum occurring wind load on the building. Wind loads are typically dependent on the geographical location and building height. The maximum shutter dimensions as a function of the maximum wind load can be found in graph

#### **Materials and Finishes**

As with other types of louvre shutters the extruded aluminium profiles in the InFinity shutter can be anodized in a range of colours or powdercoated in any RAL colour. However the design of the InFinity shutter typically suits the application of one of our premium wood-look finishes, resulting in a wooden shutter impression but without the typical wood aspects of weathering, warping and intensive maintenance. Morag provide the highest standard of sublimation finishes, providing the high protection of a durable powder coating with a superb look of wood or patinised metal designs.

## Standard Wood Look Finishes



Pine Premium BES 2120 P



Dark Pine BES 2101 P



Oak Premium BES 2321 P



Dark Oak Premium BES 2317 P

Shutter width

➡ 800

1000

1400 1600

1200

**1**800



Striped Oak Premium BES 2319 P



Walnut Premium BES 2916 P

### Shutter heights InFinity Shutter



1.8

1.7 1.6 1.5 1.4

1.3 1.2 1.1 1.0

0.9 0.8 0.7 0.6 0.5

0.4 0.3

0.2 0.1 0.0

2000

2200

2400

2600

2800



3200

3400

3600

3000

# Perforated Sliding Shutters

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Perforated Sliding Shutters regulate light and heat and at the same time bring an architectural element to the facade. The application of perforated aluminium sheet provides the required shading and allows an open view to the surroundings outside. By choosing a specific perforation or even designing a custom pattern for the building the architectural possibilities are endless.

# Key features

- Sliding shutter in aluminium perforated sheet
- Frameless, lightweight panel
- Great freedom of design in perforation pattern
- Totally weather resistant and maintenance free panel
- Manual application or reliable motorisation to increase functionality
- Reliable Morag sliding accessories.







# Perforations

Morag Global Sliding Shutter panel is offered with a choice two perforations with a 5% or 10% openness to give the best functionality for visual and thermal interior comfort. As an alternative any custom perforation or pattern may be applied, providing the opportunity for project specific façade designs.

#### **Maximum Dimensions**

The design of the Morag perforated shutter was optimised and tested to achieve a simple and lightweight solution that is nevertheless a reliable application for full floor heights and under considerable wind loads. Maximum panel dimensions as a function of maximum wind load can be found in the graph below.

#### **Materials and Finishes**

The perforated cassettes are typically produced in 2 mm aluminium sheet and powder coated with a durable polyester powder coating in a any RAL colour, resulting in a fully weather resistant shutter. As an alternative the panels can be anodized in natural silver or a wide range of other colours and shades. Anodisation is an electrolytic process that turns the top layer of the aluminium into a strong protective surface, resistant to all conditions.



Perforation A R2,5 Z10x10 Openness 5%

Perforation B R3,5 Z10x10 Openness 10%



#### **Shutter heights Perforated Shutter**

Shutter Height (mm)

# Wavy Mesh Sliding

Wavy Mesh Sliding Shutters offer a perfect solution to regulate light and heat and at the same time bring a spectacular architectural element to the facade that is striking in appearance. The application of stretched and corrugated aluminium mesh provides the required shading and allows an open view onto the street outside. A wide range of shapes, sizes and colours provide added design freedom.

# Key features

- Unique Wavy Mesh material: spectacular three-dimensional aluminium mesh in various shapes and sizes
- Special designed aluminium frame to accommodate mesh material without visible fixings
- Spectacular range of anodisation colours
- All materials are totally weather resistant and require very little maintenance
- Manual application or reliable motorisation to increase functionality.







# Mesh

The unique Wavy Mesh material comes in a variety of shapes and sizes, from very open for visual transparancy to relatively closed for best shading functionality and privacy. A few examples are shown here. A combination of two mesh materials is also possible for even more visual effect.

#### **Maximum Dimensions**

Wavy Mesh shutters are produced with an extruded aluminium profile frame. Maximum panel dimensions will depend on the maximum wind load on the building and are shown in the graph below.

#### **Materials and Finishes**

The Wavy Mesh aluminium mesh can be powder coated in a range of RAL Colours. However the unique three dimensional feature of Wavy Mesh really comes to life when the material is anodized. Anodisation is an electrolytical process that turns the top layer of the aluminium itself in a strong protective surface resistant to all conditions. Anodisation is available in a variety of colours and glosses from silver to bronze, copper and gold.







#### 1.8 1.7 1.6 Shutter width 1.5 1.4 800 1.3 1.2 1000 1.1 1.0 1200 0.9 0.8 1400 0.7 0.6 1600 0.5 0.4 0.3 0.2 0.1 0.0 2000 2200 2400 2600 2800 3000 3200 3400 3600

#### Shutter heights Wavy Mesh Shutter

Windload (kN/m²)

#### Shutter Height (mm)

# Technical Details

#### **Top & Bottom Details**

Morag Sliding Shutters come with a complete range of proprietary rail profiles, runners and accessories. All rail profiles are extruded aluminium, anodized or powdercoated to project specifications. Top and bottom runners are made of stainless steel and quality grade plastics to ensure mainenance-free functionality for many years.

Bottom rails are available as single T-profile as basic application or double box profile to provide an accessible surface at terraces, balconies etc. A range of rail fixation brackets is available for fixing top and bottom rails as single, double or triple application. The relation between available clear height and nett shutter frame height is dependent on the chosen type of bottom rail and the choice of manual or motorized operation. The illustration on the right shows this relation.





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**Top Rails 40x48** Material: Aluminium

Bottom Rails T 40x50 Material: Aluminium



20x40 Material: Aluminium



Standard fixing solutions for top and bottom rails



Bottom rails box-profile 40x20 Bottom rails T-profile 40x50



#### **Sliding Shutter Motorisation**

Shutters can slide manually or they can be motorized to function in places without personal access or simply for a more comfortable use. Motorisation also allows automation by clock or sun sensor and operation via a building management system.

Morag Sliding Shutters can be motorized with a reliable 24V belt drive system fixed to the top rail. One motor can operate up to four shutters to a maximum total weight of 120 kg. Every motor works with an electronic controller that is placed inside the building. This controller regualtes motor speed and stops the shutters when an obstacle is met.

These controllers are available as wall-mount device including power supply and open/ close buttons and as DIN rail component suitable for group installation in technical rooms, above ceilings etc. Morag motorisation systems can work with any building management system on the basis of cold contact signals for open and close.







DIN rail mounted controller