



Multi-Point Latching



This is needed primarily where an enclosure must be sealed against water usually rain or wash down.

The various standards of resistance to water include:

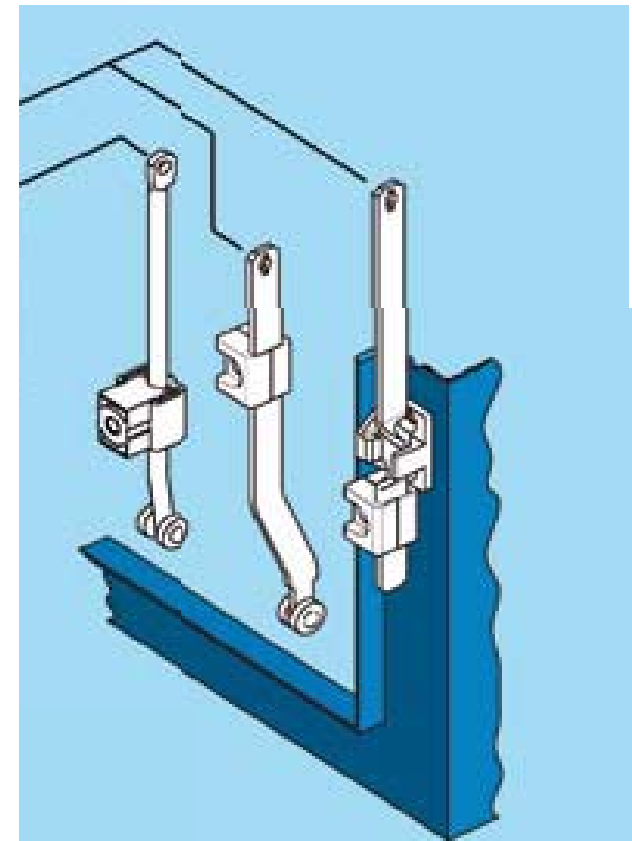
NEMA and UL standards for North America;

The Telecoms standard: GR 487

The European standards IP XX

The information here applies to quarter turn latches and Swinghandles. EMKA makes some lift-handles which may be of interest; see catalog section 3F

Please scroll down





Multi-Point Latching



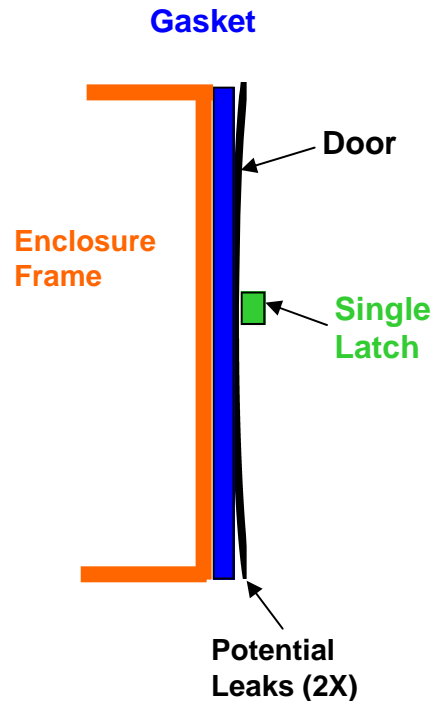
Standard	Protection against	Other
NEMA 4 & 4X / UL 50	Hosed and splashing water	4X includes corrosion resistance
NEMA 3	Rain, Snow & Sleet	Dust protected
NEMA 12, 13	Dripping liquids, rain, oil splashing	Dust protected
GR 487	70 MPH wind-driven rain	Dust protected
IP 54	Splashing water	Dust protected
IP 65	Water jets	Dust protected
IP 66	Powerful water jets/submersion	Dust protected
IP 69K	Hot Water under pressure	Dust protected



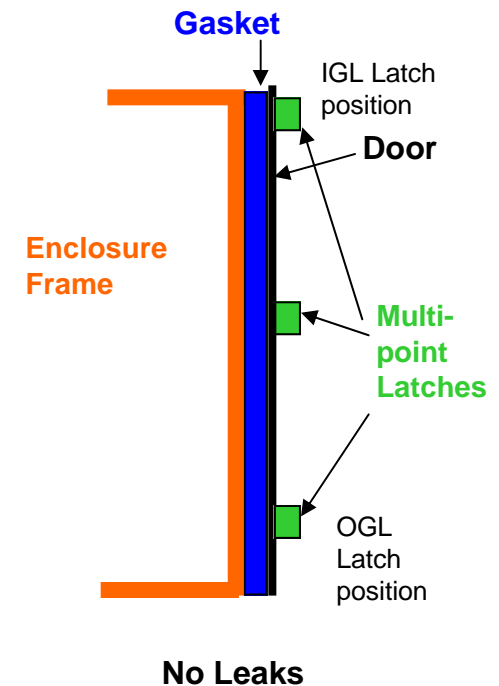
Multi-Point Latching



Sealing an enclosure



Small doors can be made watertight with one latch, but for doors longer than about 30" leakage problems may occur. See sketch on left. Leakage occurs when the door is bent away from the frame by the very significant force required to compress the gasket. Multipoint latching solves this.





Multi-Point Latching



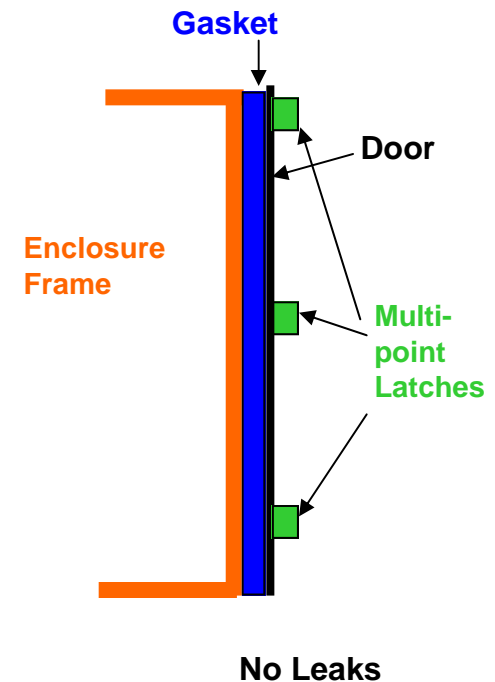
Sealing an enclosure

Other solutions include:

- Changing the gasket to a a more compliant type e.g. bubble type for foam type will cut the gasket force from approximately 40# per ft of gasket to 10#.

There are other benefits to using a clip-on bubble gasket including longer life, lower cost installation and improved reliability.

- A stiffer door, perhaps a deeper return flange will reduce the amount of bending hence the susceptibility to leak.





Multi-Point Latching



Sealing an enclosure

Often the least expensive way to achieve this sealing is to use several quarter turn latches or “NEMA” clips (see right) how many latches will actually be used? In the photo only one out of four.



Quarter turn latches are much more convenient to use so it is more likely that all will be closed, but probably not always.

A better answer is to use the required number of latches interconnected to one handle via locking rods.





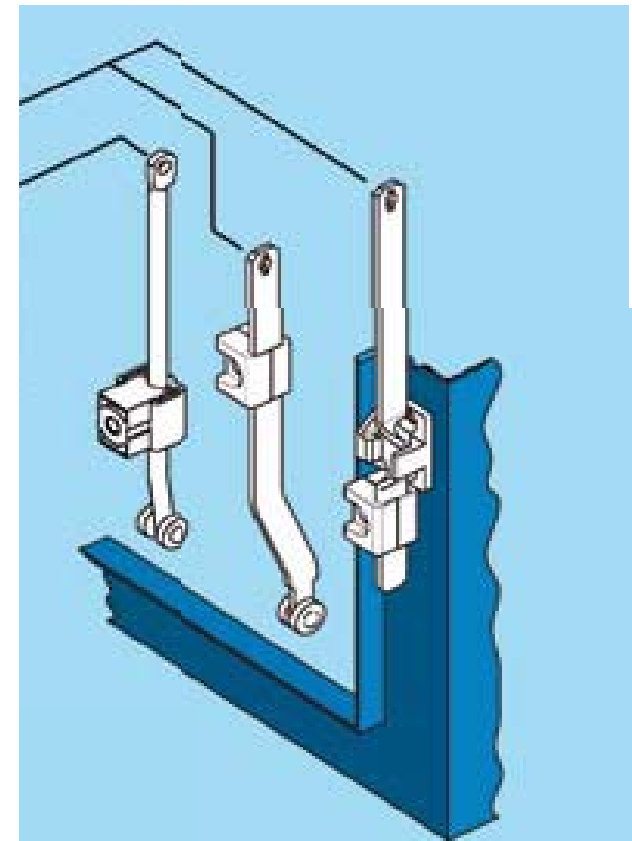
Multi-Point Latching



There are two distinct ways to latch the door to the frame of the enclosure

The leftmost and center arrangements show rods with rollers that are driven behind the frame to secure the door. This latching is **INSIDE THE GASKETED AREA LATCHING** or IGL.

The Right hand depiction shows a rod engaging with one of two or four catches on the frame side. This latching is **OUTSIDE THE GASKETED AREA** or OGL.





Multi-Point Latching



INSIDE THE GASKET

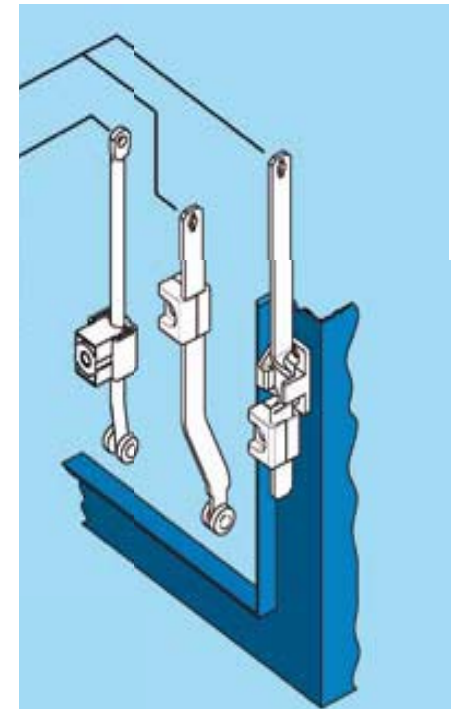
Cam used to actuate rods.
Different rod lengths
needed on different height
enclosures – adapters are
needed for small
production runs
No catches are required

SUMMARY

*“Inside the Gasket” is a little
less expensive if all the
enclosures to be built are
the same height.*

OUTSIDE THE GASKET

Must use rod control to
actuate rods – cam
moves the rods laterally.
Same standard rods
used on different height
enclosures.
Catches placed
optimally, two or four
used as required
Slightly wider flanges
needed,
Improved EMI shielding





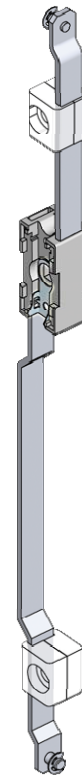
Multi-Point Latching



The two ways to drive locking rods, referred to above, are the “rod control” seen here; this is a rack and pinion gear with the latch or handle rotating the pinion gear; the flat locking rod is machined to form the rack.

This method moves the rods in one plane with no lateral movement.

The rods are 14mm x 3mm and when used in this orientation are about twice as stiff as 8mm diameter rods. Typically one rod guide per catch is used and it is placed closer to the catch, greatly reducing rod bending.



Rod Control



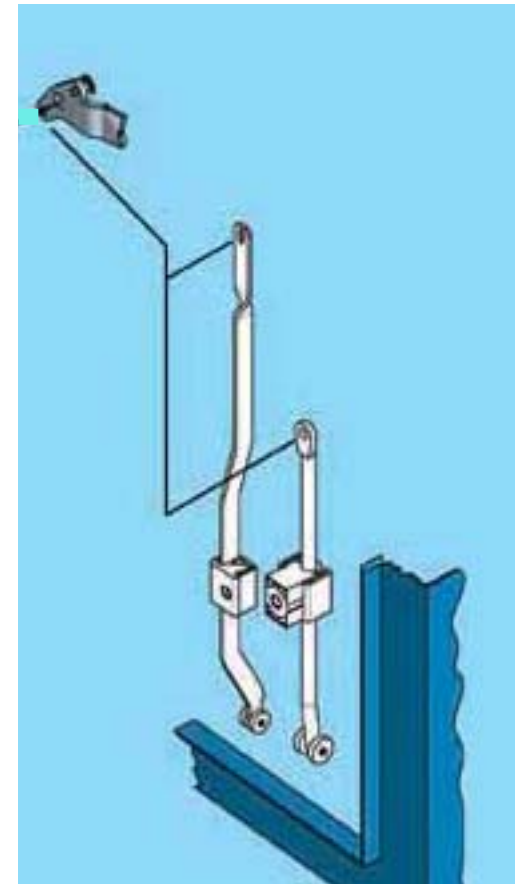
Multi-Point Latching



Cam are only suitable for IGL because they cause some lateral movement.

This illustration shows a “three point cam” the pawl part latches the frame at the handle and the two rivets engage the eyes at the rod ends.

The round rods are 8mm diameter. On tall doors with hard gaskets these will bend thus allowing the door to bend away from the enclosure; adding an extra rod guide will very significantly reduce this as will the use of flat rods or ½” square rods.





Multi-Point Latching



3 point Cams for both LH & RH Doors

Standard 1000 series has rivets and circlips suitable for round rods, these and 1107 cams move rods 18mm.



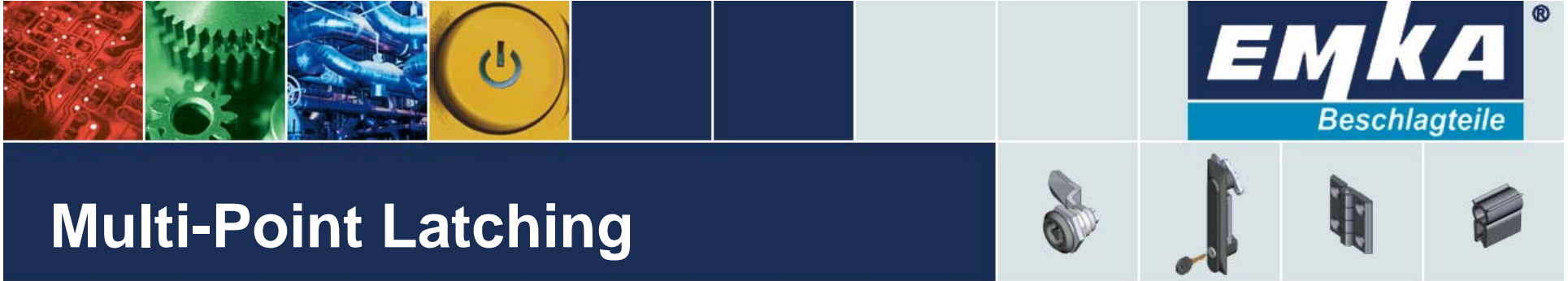
1000 series



1107 series

1107 series cams are similar to 1000s except: they have no stop and the rivets are positioned so the rod ends are 4mm further away from the door. When used with some Swinghandles this allows standard rods to clear the bottom part of the handle.

Two point versions of both these are available where no central latching point is needed



Multi-Point Latching

The 1000-U661-XX & -U662-XX 3-point cams

- 26 mm stroke Vs. 18mm for 1000 & 1107 cams
- Cannot use with rod adapter.
- Long stroke allows use of 25 mm Ø rollers
- Different cams are needed for LH & RH doors
- No stop
- Less side to side movement
- Rods are offset from the latch centerline
- Similar cams are available for flat rods: 1000-U544/5



Adapters are available to convert single point cams to allow three point latching for cam types 1000-UXX, 1107 and 1000-U66X -XX

Multi-Point Latching



Adapters – these are all used in conjunction with single point cams



1000-U776, stainless or zinc
LH or RH doors, “H” of single
point cam does not change.
Check clearance of rods with
swinghandles. Can be used
with rod adapters.



1150-U57, stainless, no stop,
LH or RH doors, “H” of single
point cam increases by 2mm.
Check clearance of rods. with
swinghandles. Cannot be
used with rod adapters.



1107-U246, stainless or zinc,
no stop, LH or RH doors, “H”
of single point cam increases
by 2mm.
Check clearance of rods with
swinghandles. Can be used
with rod adapters.

Multi-point Latching



IGL Rods

Round rods are generally preferred to flat rods (in IGL applications) because of the availability of adaptors which facilitates prototype runs and small orders.



These rods with rollers are made to length, MOQ = 100
The eye fits on the cam rivet

Where small quantities are needed, standard length rods are cut to length and fastened to the adaptor



Chamfered rods are often used on overlapping "french doors"

Multi-Point Latching



Round Rods are attached to doors with these ***ROD GUIDES***

Both types have two “heights”, that is the distance from the inside of the door to the bottom of the rollers, these are 20 and 26mm. Both are attached to the door by weld-studs or PEM studs.

The clip-on cap of the 1001-U40 & -U41 makes the system a little easier to assemble, however it is possible to feed the coined end of a rod through the hole in the –U11/12 type.



1001-U11, -U12



1001-U40, -U41

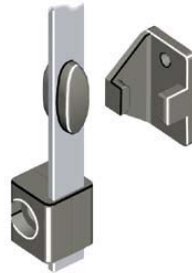
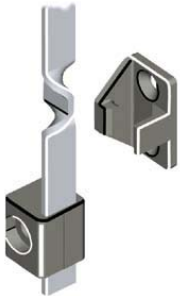
Multi-Point Latching



RECOMMENDED OGL ROD TYPES

Twisted rod

Inexpensive
Lead of 6.5mm
Robust

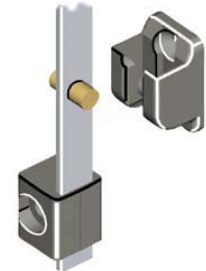


"Football"

Lead of 6.0mm
Smooth action

Brass Rollers

Lead of 8.0mm
Anchors door
vertically



Each rod type has specifically designed catches, each catch has multiple options for securing them to the enclosure. The hole patterns of the catches are identical to those of hinges to form a coherent closing system. This allows reversibility of doors from right hinged to left hinged and vice versa.

Multi-Point Latching



SOME OGL ROD GUIDES



Flat rod Clips in



Cover clips on



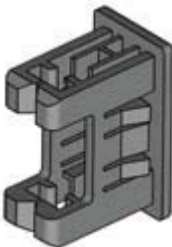
Rod Guide can be pre-assembled on rod



stainless steel

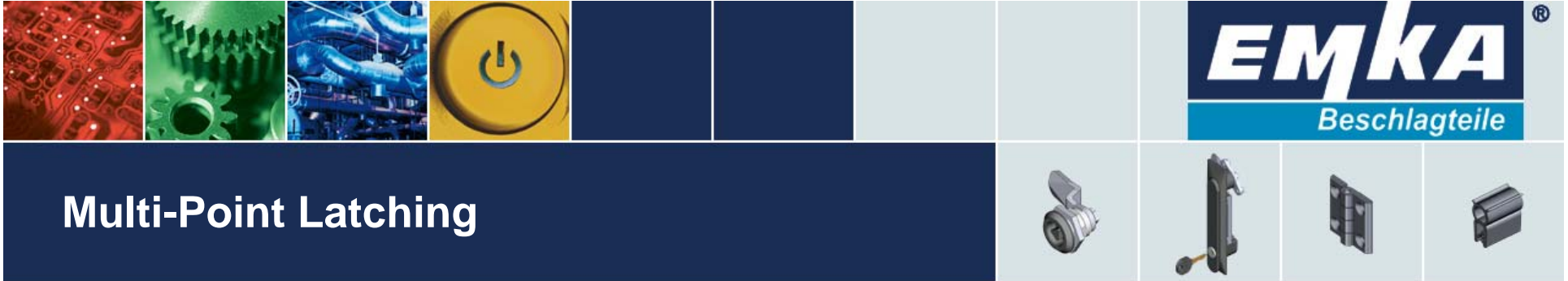


Rod Guide also acts as a cable guide



Rod Guide clips into door

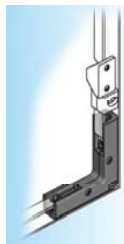
Some quick assembly Rod Guides not shown

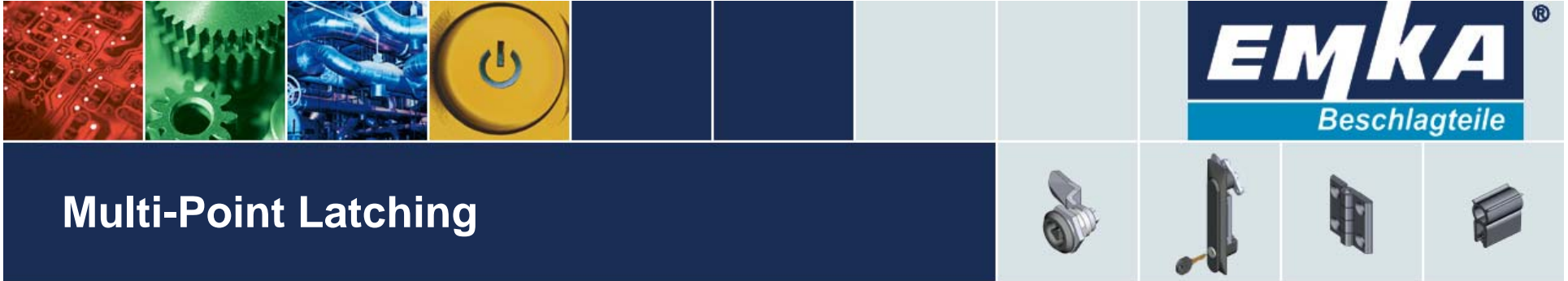


Multi-Point Latching

Outside the Gasket Latching

- Rod Controls are designed so that 2 identical rods are used on an enclosure.
- Only 4 different rods are needed for every enclosure height from 800mm (31") to 2200mm (87") .
- The enclosure flange typically needs to be 45mm wide, where this is a problem EMKA has systems for flanges of around 20mm width.
- Conventional steel and stainless rods are shown here, some systems with glass reinforced polymer rods offer lower costs and zero corrosion
- The proximity of the rod guides to the catches essentially eliminates the rod bending problem
- Depending on the rod type the door can be about 6mm from its latched position before operating the handle. This means a smoother closing operation.
- To latch the top and bottom of the door the motion of the rods must be turned 90° see below (P/N 1211-U170)





Inside the Gasket Latching

- Easy switch from single point to 3-point latching.
- For long runs of cabinets of the same height this is very inexpensive
- Where several different enclosure heights are produced there are extra costs .
- Zinc plated steel and stainless rods are available.
- Where rod bending may cause leaks this can be solved by using extra rod guides or an upgrade to ½" square rods.
- With standard rollers 15Ø the door must be closed to within about 3mm of its latched position before operating the handle. 25mm diameter rollers are available
- Two point latching with chamfered rods is standard