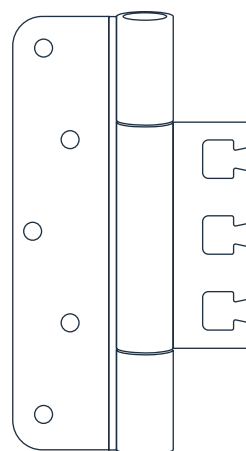


Hinge technology

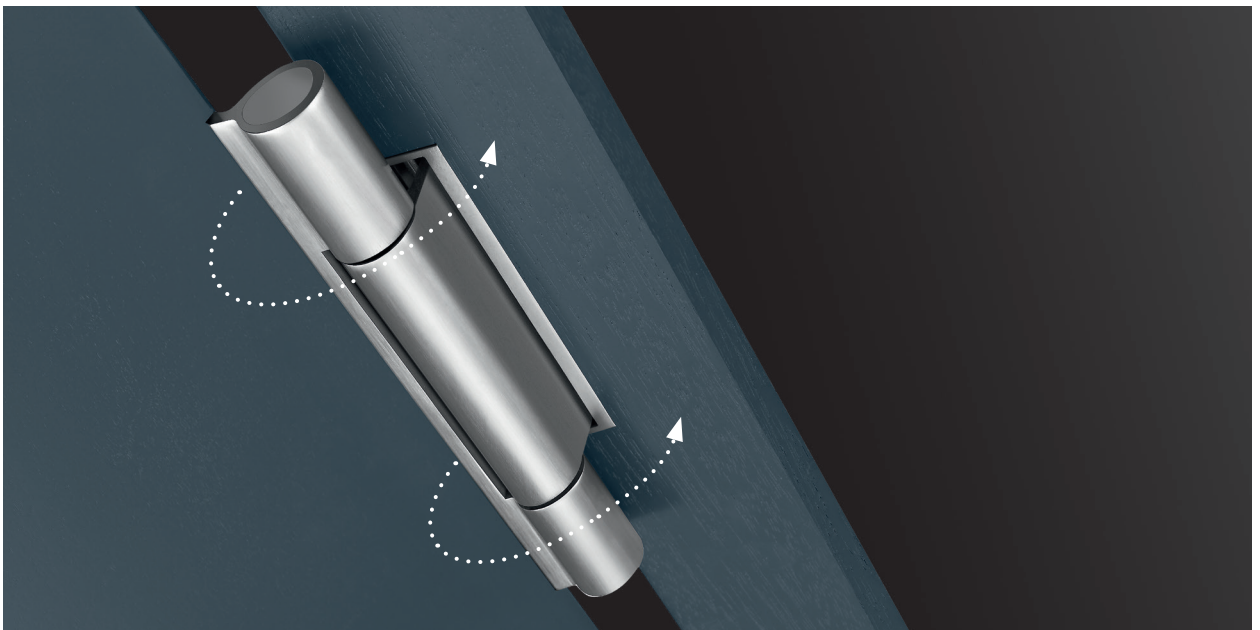
# Supporting rollers



## Defying the laws of leverage

The hinges connect the door leaf to the frame and enable its opening and closing. The German term Band originates from the time when doors had iron bands fitted to them, the ends of which were bent to form an eye. This eye was then hung onto a tang protruding from the door frame, thus giving rise to the English word hinge.

Many aphorisms have been dedicated to doors. One of the most powerful comes from a quote by Archimedes: "Give me a firm location outside our earth, and I will lift the world off its hinges". This adage is always used when something fundamental is changed, when a philosophy alters or a paradigm is to be reappraised. Archimedes was referring to the laws of leverage.

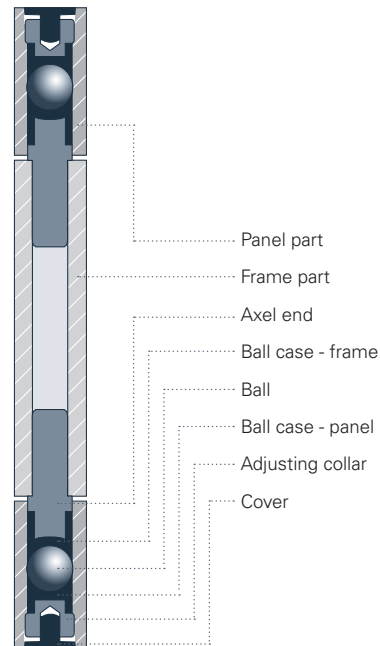


This remains true to this day: good hinges ensure that doors open the way we expect them to. They define the fulcrum - and thereby the mobility of the door - and give the door leaf a solid support.

Door hinges must be precisely coordinated to the dimensions of a door - to its measurements, weight, type of mounting and location. They are not just hard-wearing components of a door. ECO Schulte can look back on decades of experience in the manufacture of hinges. ECO hinges are premium products that comply with the standard **EN 1935**. They bear the CE mark and are tested in the highest standard class (14).

## Premium ball-bearings

The quality of a hinge is determined to a great extent by the quality of the bearing. That is why ECO Schulte developed its own bearings technology especially for its hinge plates (Patent: DE 103 61 548.2). The bearing is characteristic: the roller is guided top and bottom on a steel ball, each mounted in two high-strength plastic trays. This specific bearing is wear, maintenance and play-free and guarantees the light and smooth running of the door. The double bearing controls axial and radial forces effectively and permanently. In a series of practical tests, this bearings technology was successfully tested by an independent institute for more than one million closing actions. That more than guarantees lifelong, secure functioning.



## Hinge plates - Versions

The high-quality hinge plates from ECO Schulte are available for all standard door types. Individual solutions to match each door are also available, depending on requirements.

### OBX hinge plates - Perfectly adjustable

Because hinge plates of this type are three dimensionally adjustable within the element that holds them when the door is mounted, installation is made considerably easier. The number behind the OBX mark indicates the diameter of the roller used. Hinge plate OBX 20 is cast in stainless steel for the highest possible surface quality and fitting precision of the roller and eye.



### OBN hinge plates - Firmly bolted for fixed doors

Hinge plates of this type are installed by the door manufacturer or processor and cannot be adjusted. The number behind the OBN mark indicates the diameter of the roller used. Hinge plate OBN 20 is cast in stainless steel for the highest possible surface quality and fitting precision of the roller and eye.



## The highlights of the system

The quality of a hinge can be seen from the details. ECO is the specialist for hinges and can score points here - not only through the fact that ECO hinges can be used DIN-left / DIN-right without conversion.

### Premium ball-bearings

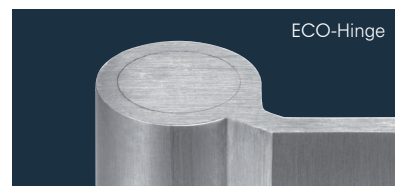
With its patented ball-bearing technology, ECO Schulte has a unique selling point in the market and sets a new standard in the premium segment. The right product for those who place the highest demands on a door hinge. ECO Schulte OBX and OBN hinges are absolutely maintenance-free and work without any lubrication. Unsightly deposits of grease and oil on the visible parts of the hinge are a thing of the past. The absolutely play-free door bearings guarantee optimum load transfer via both hinges.



### Cast roller holders

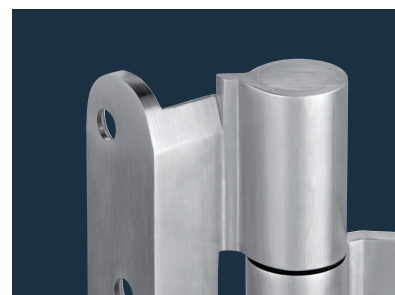
The processing of stainless steel is a demanding affair, as can be seen from the example of the hinge roller: ECO investment casting technology produces a perfect, closed roller holder. Thanks to the homogeneity of the material all the way through to the hinge flaps, the load transfer of our hinges is guaranteed to a well above average extent.

That precision and quality of this kind are not a matter of course can be seen from the rival product depicted here. The holder of this roller has some play and can be levered up - a mortgage on the service life of the product and an invitation to burglars.



### Defined edges

ECO Schulte hinge plates are in a class of their own where aesthetics and precision are concerned. The defined edge of the holder surface ensures the best possible fitting precision and force distribution. It also proves that the system constructors from the Westphalian town of Menden are masters where the handling of materials and hinges is concerned.



### System-identical finish pattern

ECO Schulte perceives the door as a system consisting of all of the functional elements that make a door open and close. Where the hinge plates are concerned, ECO demonstrates a love of detail by polishing the stainless steel surface of the hinges in the longitudinal direction so that the fine finish pattern thus produced is exactly the same as the one on the handle fittings from the same company.



## Weights and loads

Door hinges are high load-bearing construction elements. They not only have to carry the weight of the door itself, they are subjected to much higher loads, depending on where they are used. Frequent opening, slamming and exceptional handling of doors, as occurs in barracks and schools, can take conventional hinges to their limits if they are only designed to carry the weight of the door.

ECO Schulte hinges have a closed hinge roller which is manufactured using elaborate cold forging technology which prevents the roller from bending up. There are no compromises with the material thickness of the hinges either: ECO Schulte hinge flaps can carry loads of up to 300 kg each.

### Maximum door weight of hinge plates

Notch	max. door load: 300 kg	max. door load: 200 kg	max. door load: 160 kg	max. door load: 120 kg
<b>Rebated notch</b>	OBX-20-1531/160	OBX-20-1531/120	OBX-20-1951/120	
	OBX-20-1532/160	OBX-20-1532/120	OBX-18-1532/160	
		OBX-20-1951/160		OBX-18-1531/120
			OBX-18-1531/160	
<b>Unrebated notch</b>	OBX-20-2541/160	OBX-20-2541/120		OBX-18-2541/120
	OBX-20-2542/160	OBX-20-2542/120	OBX-18-2541/160	
	OBN-20-4141/160			OBN-18-4141/120
			OBN-18-4141/160	

The listed values were measured under 100% test lab conditions. Please observe them when selecting hinge plates.

Assuming the proper mounting of the door, the material stability of the construction element to which they are to be attached and an effective bonding with the masonry, ECO Schulte hinges should be selected and utilized in accordance with the above table with sufficient load and safety reserves, particularly where special locations are concerned. The use of a third hinge with the ECO Schulte system is only necessary under particularly difficult conditions. A third hinge attached in the upper third of the door frame can increase the load-bearing capacity of the hinges by around one third.

The following data relates to a door leaf size of 2x1 m, the application of two hinges and a professional installation. The EN 1935 is the basis of the development of our object hinges. The norm requirements regarding the use of hinges are in accordance with the guidelines required in Europe. ECO hinges are way beyond these requirements. ECO hinges therefore fulfill the highest demand for which the object industry is known. The multitude of the individual criteria of choice, for example installation site, use of the doors and so on, cannot be considered for the determination of the values. Therefore we recommend to take reserves into account for the protection of the individual's safety. The correct choice of the hinges should be made accordingly.

For any further information / questions please feel free to contact us.

## For all notches

Technical, construction and aesthetic requirements determine the form of the edge of the door leaf - and consequently the required hinge. Typical edge types are blunt notch and rebated doors - and variations thereof. ECO Schulte has hinges in its range for the following door notch versions:

### Rebated door versions:

#### 1a. Rebated door

The rebated door leaf has a single groove on the lateral and upper edge. The closed door locks into the frame so that no gap is visible.

#### 1b. Rebated door with leaf seal

This rebated door has an additional seal in the locking groove.

### Variations of the flush door:

#### 2a. Flush door

The door leaf of a flush door is flush with the frame when closed. A circumferential gap (joint clearance) remains visible from the abutment side.

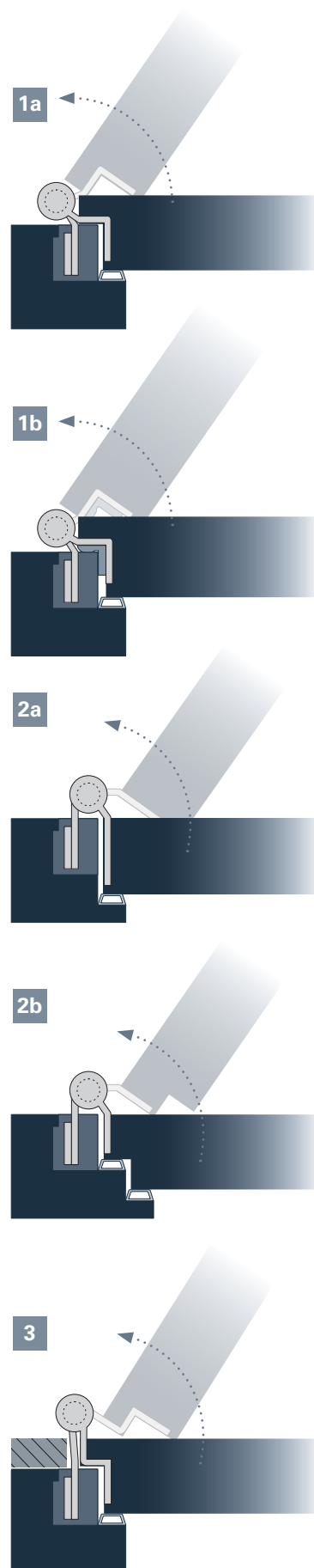
#### 2b. Flush door with double groove

This door combines the optical effect of the flush door (frame and door leaf flush) with the improved sealing properties of the grooved door. A double rubber seal in the door frame ensures outstanding sound and heat insulation. This makes the double groove door a typical front door in many homes.

### Variants of the grooved, flush-surface door:

#### 3. Diminishing door

A special door design with which continuous wall panelling extends over the door leaf. The door leaf is grooved but closes flush with the panelling. A circumferential gap (joint clearance) remains visible from the abutment side.

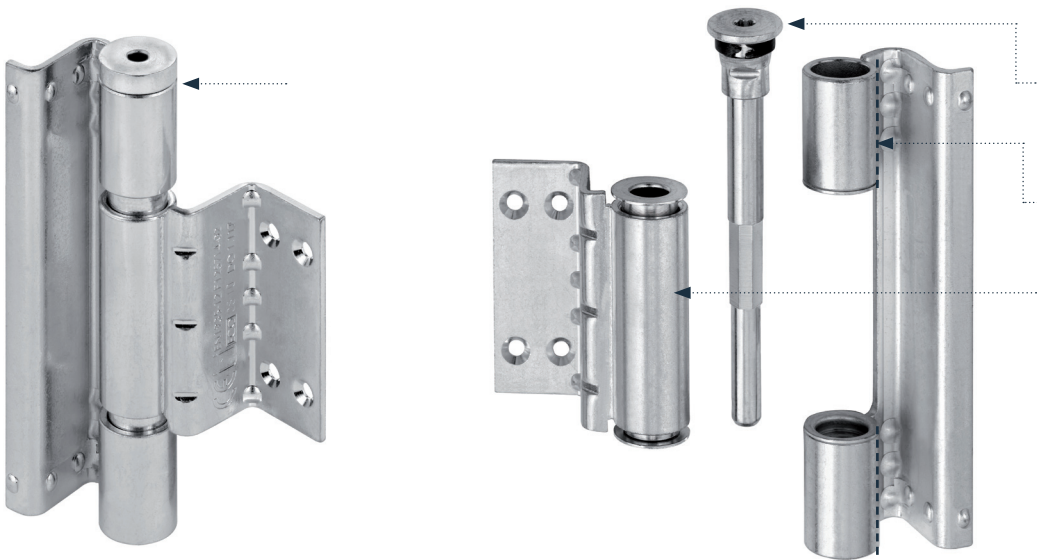


## Steel doors: OEM hinges made to measure

ECO Schulte offers processors and door manufacturers a wide range of individually developed hinges for sheet steel doors (German Patent 102008049740.1, European Patent 09008617.4). These hinges are constructed and manufactured for series production in accordance with customers' requirements. The most innovative OEM solution from ECO Schulte is called the ECO GENIUS LHA and is a laser-welded industrial hinge.

LHA stands for "laser hinge adjustable" and it is not only laser-welded but also height adjustable. "

Laser welding technology produces minimum contact, precise and highly stable welding seams. The technology combines top manufacturing precision with a high load-carrying capacity. The height adjustment of the hinge during assembly is very simple and is carried out using a standard commercial Allen key.



The new manufacturing concept satisfies the needs of the door industry in a flexible manner:

- Frame and leaf parts are available separately
- A set consists of a spring hinge that support the closing force and a standard hinge (KO hinge)
- Various materials available (galvanized or stainless steel)
- Various material thicknesses (3, 4 or 5 mm)
- Flexible tools for a flexible manufacturing concept

ECO Schulte GmbH & Co. KG  
Iserlohner Landstraße 89  
D-58706 Menden

Telefon: +49 2373/92 76-0  
Fax: +49 2373/92 76-40

[info@eco-schulte.de](mailto:info@eco-schulte.de)  
[www.eco-schulte.de](http://www.eco-schulte.de)

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