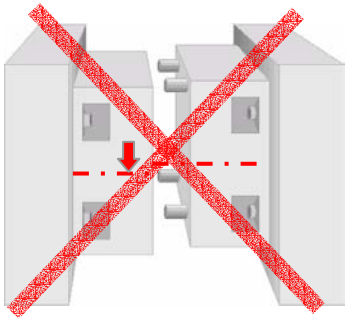
# MOUNTING OF MOULDS ON INJECTION MOULDING MACHINES

This description is valid for all injection moulding machines and ‚standard moulds'. Special moulds can possibly need a special procedure deviating from this description, but this must be made known expressly by the mould manufacturer. In all other cases it must be proceeded according to this description.

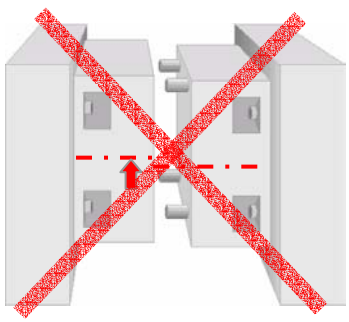
*In order to be able to operate a mould as ideal and wear-free as possible, both mould halves must be mounted best possibly concentrically to each other. The present description is a guideline, it shall ensure a repeatable ideal mounting also by differently trained personnel.*

Each displacement of the two mould halves to each other leads to increased wear on the guides and in further sequence often also on the inserts and cores. As in the vertical plane the gravitational force acts, specially the height displacement of the mould halves must be observed. As guide value a displacement of less than 0.05 mm should be striven for. From 0.1 mm usually already knocking noises at the immersion of the guides can be heard and wear on the guide columns becomes apparent.

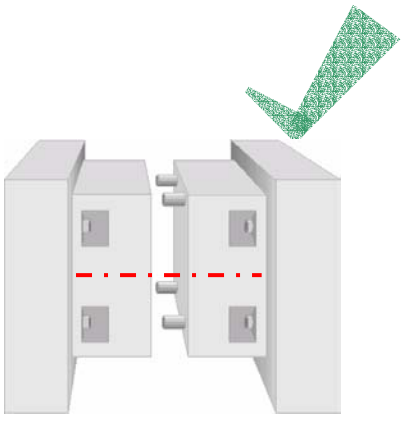
## Correct and wrongly mounted mould



**Wrong:**
The mould half on the ejector side of the mould is mounted too deep as compared with the fixed mould half



**Wrong:**
The mould half on the ejector side of the mould is mounted too high as compared with the fixed mould half



**Correct:**
Both mould halves are mounted with best possible concentricity to each other

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# 1. Correct attachment of the mould on the crane

## 1.1 Both mould halves attached together

**Figure 1.1.1**
Do not twist mould halves by bridge to each other

**Figure 1.1.2**
Attention at differently heavy mould halves

**Figure 1.1.3**
Do not attach mould off-centre

**Figure 1.1.4**
Do not attach mould halves individually

**Figure 1.1.5**
If possible use elastic stop means or crane balance

### Figure 1.1.1

When both mould halves are installed together, they shall be connected with a bridge. This connection bridge must not twist the two mould halves in their mid-position to each other. In case of doubt the mould halves should be mounted individually.

### Figure 1.1.2

When differently heavy mould halves are connected with each other via a bridge, attached on the crane, the bridge should be fixed exactly in the centre of gravity of each individual mould half. When this is not possible, the bridge must be dimensioned very stiffly.

### Figures 1.1.3

The lifting eyelet should lie exactly on the centre of gravity of the whole mould in order that it hangs on the crane ‚straight' if possible, by no means it should hang inclined so that it is applied on the upper side on the mould fixing platen to be mounted and on the underside a gap exists. A slight, contrary hanging inclined would be less problematic as by a slight pulling inclined with the crane to the mould fixing platen the mould can be applied full-surface.

### Figure 1.1.4

The two mould halves should be entirely closed on the mould parting surface, the mould halves should not be attached individually.

### Figure 1.1.5

During the installation, in the mid-position of the mould fixing platen, the mould should be supported by

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the crane best possibly. As with a crane in the height it can only be positioned in the millimetre range, but not on hundredths of millimetres, as connection between crane hook and lifting eyelet an elastic if possible stop means (e.g. plastic rope) should be used. Best however is the employment of a crane balance, this ensures during the whole installation process that it is always lifted exactly with the mould weight and the mould is installed in the machine if possible uninfluenced by the gravitational force. The higher the weight of a mould, the more important the use of a crane balance gets. As guide value 200 kg can be considered, at heavy moulds one should no longer do without a crane balance, but also at lighter moulds its employment is no disadvantage. A well suitable, economical device is described in the appendix.

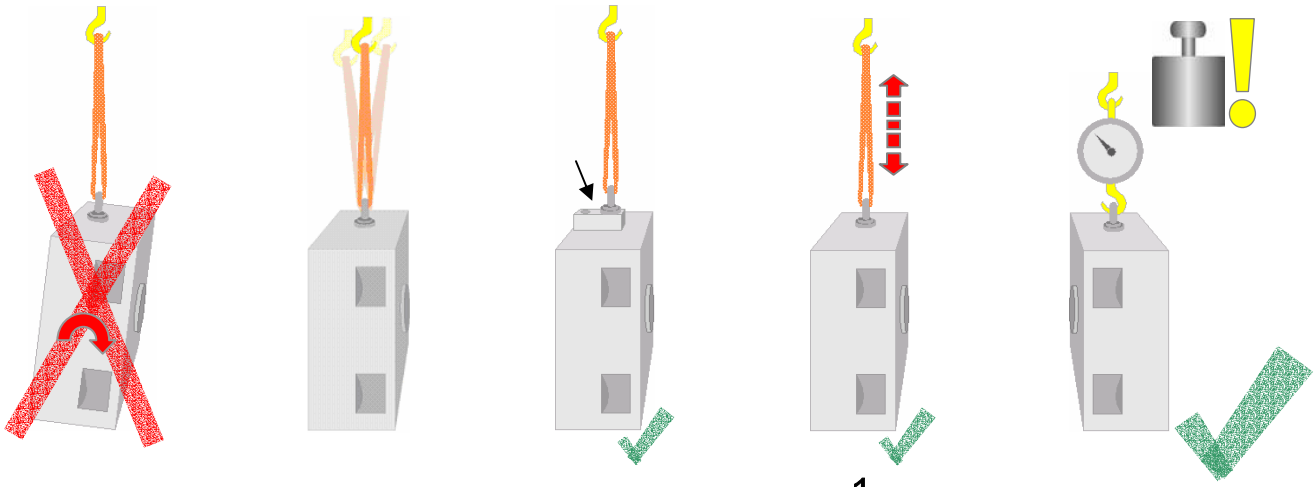


**Figure 1.2.1** Attach individual mould half not off-centre

**Figure 1.2.2** Position crane centrally, avoid inclined pulling

**Figure 1.2.3** If necessary, use suitable intermediate piece

**Figure 1.2.4** First mould half (with centring) can be attached and installed con-

**Figure 1.2.5** Install second mould half best by means of a crane balance

**Figure 1.2.1**

Also when the mould halves are installed individually, they should be fixed on the centre of gravity exactly if possible in order to hang on the crane 'straight'.

**Figure 1.2.2**

At the installation of the mould the crane should be positioned exactly over the centre axis of the mould fixing platens, a pulling inclined twists the mould and must therefore be avoided.

**Figure 1.2.3**

When the fastening thread does not lie exactly on the centre of gravity of the mould, an intermediate piece should be attached.

**Figure 1.2.4**

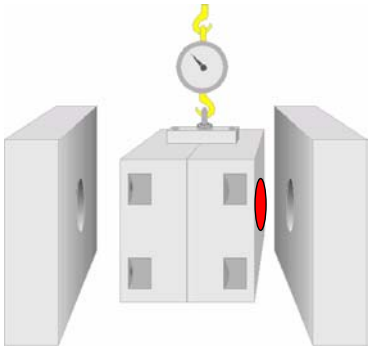
At first the mould half must be installed with the centring carrier, this is in the normal case the fixed mould half. When it is a rotary table application, the mould half on the rotary table side must show the centring carrier and therefore also be installed at first (see chapter ‚Rotary table applications'). The mould half to be installed at first can be attached conventionally, it is positioned via the centring carrier, therefore no consideration of the mould weight is necessary. An elastic if possible stop means is advantageous, also a crane balance can be used.

**Figure 1.2.5**

The second mould half to be installed, which is equipped without centring carrier or only with a rough centring, must hang on the crane with its own weight as exactly as possible after the closing of the mould and immersion of the guide bolts. When it is lifted too little or not at all, this mould half hangs with its own weight on the

guide columns which distort and have a certain play having a one-side effect. This would entail that this mould half would be mounted too deep. When it is lifted too much, either the stop means can tear or the mould half is positioned too high and mounted.

In order to lift exactly with the own weight of the mould half, a crane balance should be used. Before the immersion of the guide columns the weight is read off, but after the closing of the mould still without closing and contact force, it is lifted or lowered with the crane so much until again exactly the weight read off before is displayed. The heavier the second mould half to be installed, the more important the use of a crane balance gets. As guide value 200 kg can be considered, at heavier moulds one should no longer do without a crane balance, but also at lighter moulds its employment is no disadvantage. A well suitable, economical device is described in the appendix.



Standard application, centred on the fixed mould half

## 2. Correct centring of the mould

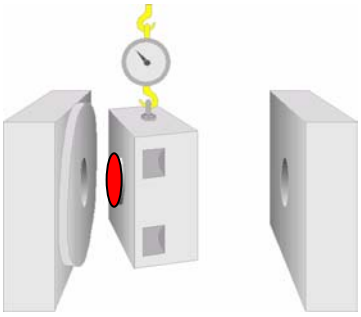
### 2.1 Standard applications

A standard mould is centred in the normal case on the fixed mould half. This centring carrier diameter on the mould is produced usually by 0.1 mm smaller than the centring hole of the mould fixing platen. n the moving mould half no centring is necessary, but, as installation aid for the individual mounting of the mould halves, also on this side a centring carrier, but by at least 0.5 mm smaller, can be attached.

### 2.2 Rotary table applications

*For a rotary table mould the mould half on the rotary table side must be finely-centred on the rotary table.*

**When using a rotary table, the mould half on the rotary table side must be mounted to <0.05 mm exactly in the means of the rotary table. In order to ensure this, the following items must be observed:**



Rotary table mould, fine-centred on the rotary table

- The centring diameter on the mould may only be fabricated by maximally 0.05 mm smaller than the centring hole of the rotary table.
- The centring carrier of the mould must be positioned to 0.02 mm exactly within the mould geometry (inserts and guide columns).
- The mould half on the rotary table side must turn around its centre axis as exactly as possible. When it is mounted with a middle displacement, a 'crank effect' arises through which on the 2nd rotary table position a displacement of the two mould halves arises (see description at the right), which becomes apparent by knocking noises during immersion as well as by increased wear of the guide columns.

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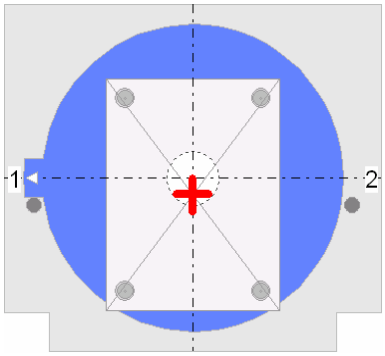
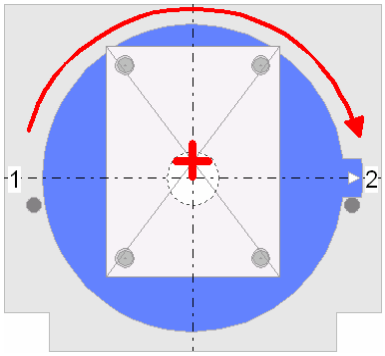
**Impact of a mould half mounted on the rotary table off-centre:**




**Rotary table position 1**
Mould half mounted on the rotary table off-centrally: The mid-point of the mould half on the rotary table side (red) lies 0.1 mm below the rotary table centre axis (Assumption). During mounting the fixed mould half is aligned exactly to the one on the rotary table side, thus the coaxiality of the two halves is exactly identical on this rotary table position




**Rotary table position 2**
After the swivelling of the rotary table by 180° the mid-point of the mould half on the rotary table side is 0.1 mm above the rotary table centre axis. The fixed mould half still lies 0.1 mm below the rotary table centre axis, therefore the displacement of the two halves to each other is now **0.2 mm**

## 2.3 Heavy moulds

For heavy moulds (over ~200 kg) during mounting a crane balance should be used. When no crane balance is used, heavy mould halves can be mounted very hard exactly coaxially to each other, therefore it can be advantageous to centre them on both sides with a fine centring.

*When it is centred on both sides, it must be ensured that the 2 centring carriers are positioned on the mould to under 0.05 mm exactly coaxially to each other.*

In this case also the centring diameters of the two mould fixing platens must be aligned exactly coaxially to each other. ENGEL injection moulding machines are aligned in standard to <0.1 mm coaxially. When higher precisions are requested, this must be indicated when ordering the machine.

Special feature on tiebarless machines:

When on the moving mould half the allowed mould tilting moment (weight of the moving mould half x centre of gravity distance, see instruction manual) is exceeded, an additional support must be installed. This consists of 2 further guide shoes (one each on operator and rear side) together with supporting consoles, which re either fixed on the mould area of the moving mould fixing platen or directly on the moving mould half. The adjusting spindles screwed through the supporting consoles support themselves on the upper side of the guide shoes, they must not be connected with these fixed as under clamping force the moving mould fixing platen and therefore also the additional support must be able to lift from the guide shoes. The setting of the spindles may only be made without clamping force with mould closed

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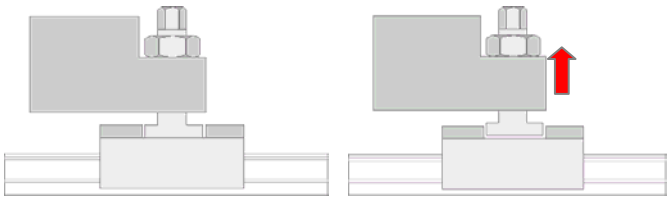
in the set-up pressure. The spindles are pre-stressed only slightly, the moving mould fixing platen must



## 2.4 Special cases

*In special cases it must be decided individually on which half it is centered, but the following principles must be observed:*

The fine centring should always be provided on that half with the biggest precision demand. In the normal case this is the fixed mould half as here the nozzle shall meet the nozzle contact point as exactly as possible.

When a drive and/or swivelling equipment such as a so-called 'Gealan Drive' is used, which is integrated into one of the two mould fixing platens, also the centring of the mould must be attached on this half.

## 2.5 Mould torsion safety (rotary centring)

*When a mould torsion safety is used, this must be positioned on the half on which also the mould centring (fine centring) is.*

When for example a rotary table is used, a possibly existing torsion safety of the mould must also be attached on the rotary table side as at an individual mounting of the mould halves at first the half on the rotary table side must be mounted and this can therefore no longer adapt itself in its torsion to the fixed mould half.

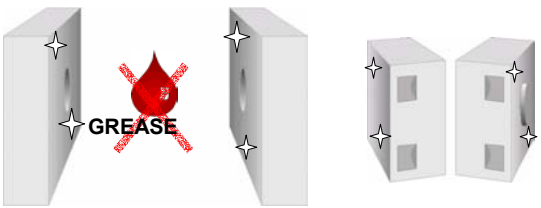



**Figure 3.1**
Pull off mould fixing platens and mould outer surfaces with oil rubber, clean grease-free

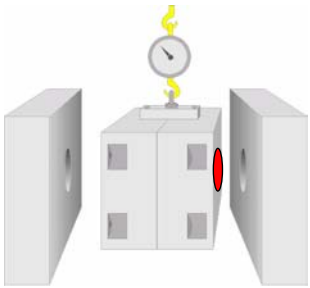


**Figure 3.2**
Mould halves centred with crane balance on the crane, connected with bridge on fixed mould half

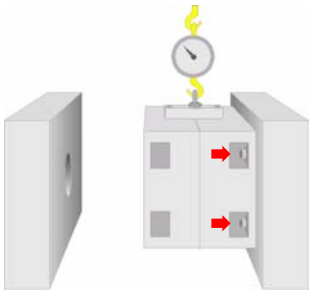


**Figure 3.3**
Tighten mould, hanging on the crane, on the fixed mould half

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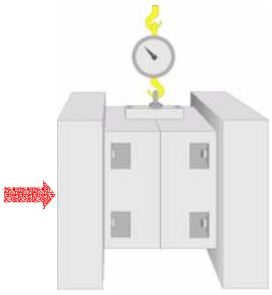

**Figure 3.4**
Close with set-up pressure, determine mould height

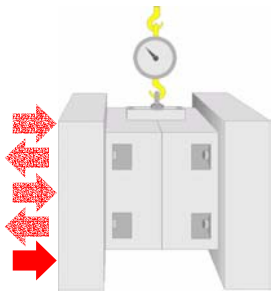

**Figure 3.5**
3 times clamping force up-down and build up again

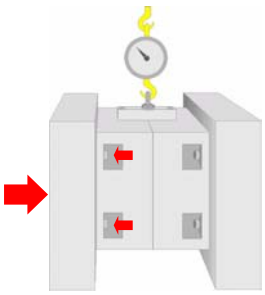

**Figure 3.6**
Tighten moving mould half under clamping force

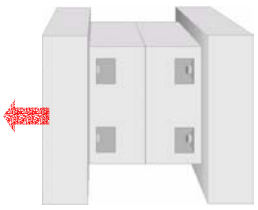

**Figure 3.7**
Remove crane and connection bridge, mould can be opened

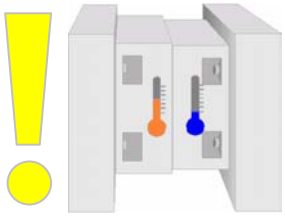

**Figure 3.8**
Avoid temperature differences of the mould halves

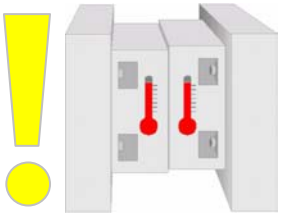

**Figure 3.9**
High operating temperature can lead to displacement of the mould halves

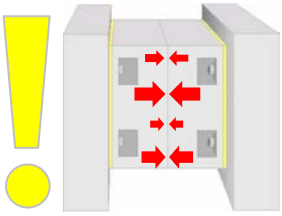

**Figure 3.10**
Unparallel insulating plates cause bad pressing distribution

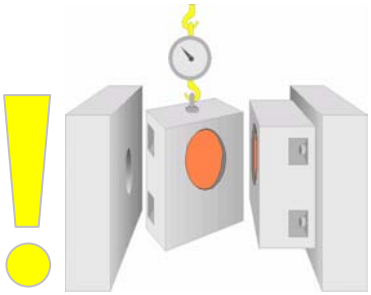

**Figure 3.11**
Avoid eccentrically arranged cavities

**Figure 3.1**
Clean the assembly areas of the mould fixing platens and of the mould and possibly pull off with an oil rubber. The contact surfaces must be clean and grease-free, good friction closing must be enabled, do not enclose any grease-proof paper, only very slight oiling for the purpose of corrosion protection (possibly rust protection spray) can occur.

**Figure 3.2**
Bring in both mould halves together, connected with each other via a bridge, in the machine and apply on each mould fixing platen on which also the (more exact) centring carrier of the mould is, this is in the normal case the fixed mould half. Pay attention to that the mould hangs on the crane beautifully straight, by no means the mould should hang inclined so that it is applied on the upper side and on the under side a gap exists. A contrary hanging inclined would be less problematic as by a slight pulling inclined with the crane, towards the mould fixing platen, the mould can be applied full-area.

**Figure 3.3**
Introduce the centring carrier in the centring hole of the mould fixing platen, align the mould, possibly by means of a water level, rotationally and, still hanging on the crane, tighten on this side.

**Figure 3.4**

Close the moving mould fixing platen in the set-up mode and determine the mould height, the mould having still hanging on the crane.

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**Figure 3.5**

Afterwards build up and reduce clamping force approx. 3 times, not opening the mould only the clamping force should be reduced. At this alternate building-up and reduction of the clamping force both mould halves can fine-align to each other in the µm range. Prerequisite is that the mould still hangs on the crane exactly with its own weight. Afterwards build up clamping force.

**Figure 3.6**

With built-up clamping force tighten the mold mounting screws on the moving mold half. The formula for the minimum screw-in depth reads: Screw diameter x 1.5. The quality of the screws should be 8.8 or 10.9, harder screws can, specially at cast mold fixing platens, represent a certain danger for the mounting thread. When a high speed mold mounting device is used, also clamping force must be built up before the moving-in of the clamping wedges.

**Figure 3.7**

Remove crane and connection bridge, afterwards the mould can be opened and/or connected and be put into operation.

**Figure 3.8**

Temperature differences of the two mould halves to each other lead to different thermal expansions and therefore to different dimensions. This can entail increased wear as well as displacement of the moulded parts on the mould parting surface.

**Figure 3.9**

When high mould temperatures are run, during the heating-up phase the not-centred mould half, due to the thermal expansion can leave its mid-position especially with unsymmetrical arrangement of the mounting points. The consequence would be a coaxial displacement of the two mould halves. In this case it is necessary to hang the not-centred half after the heating-up on the crane anew, to lift this half as exactly as possible with the own weight, to loosen the mounting screws of this half and to carry out the mounting procedure anew from 3 times clamping force build-up and reduction.

**Figure 3.10**

Possibly used insulating plates must show a good parallelism and constant wall thickness, deviations of >0.05 mm entail an uneven pressing distribution in the mould and can lead to overfeeding and flash formation on the moulded parts. Insulating plates are also subject to a certain wear, therefore parallelism and wall thickness should be checked specially when problems appear.

**Figure 3.11**

Eccentric arrangement of the cavities leads to higher demand on clamping force. The further the cavities are arranged non-symmetrically outside the means, the more clamping force is needed in order to avoid overfeeding. Therefore, at the layout of the mould, it should be attempted to arrange the cavities if possible symmetrically and near the means.

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## 4. Correct mounting of the mould halves individually:

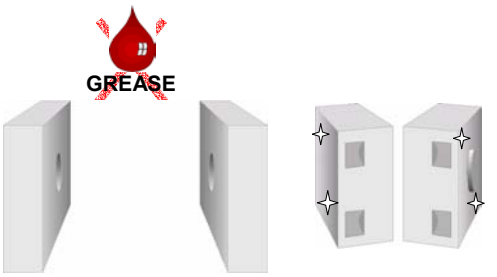



**Figure 4.1** Pull off mould fixing platens and mould outer surfaces with oil rubber, clean grease-free

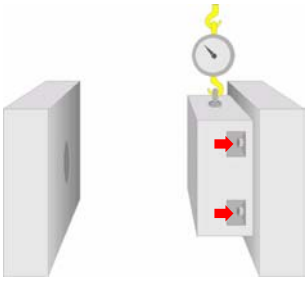


**Figure 4.2** Tighten the centred mould half hanging on the crane, centred in standard on fixed mould half

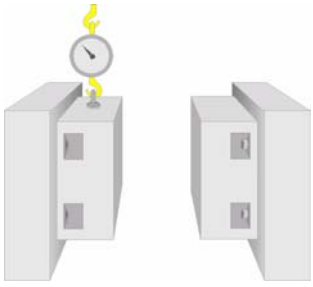


**Figure 4.3** Apply moving mould half with crane balance centrically on moving mould fixing platen

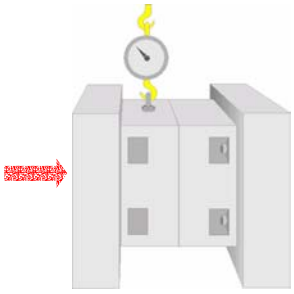


**Figure 4.4**
Close with set-up pressure, determine mould height, display of the crane balance shall

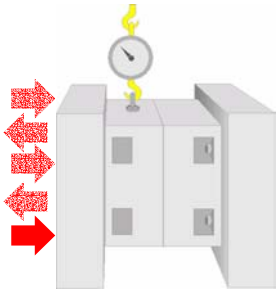


**Figure 4.5**
3 times clamping force up-down and build up again, moving mould half hangs on the crane

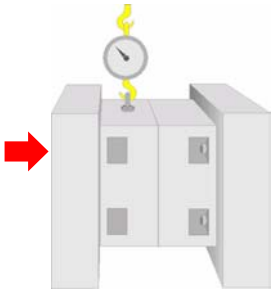


**Figure 4.6**
Tighten moving mould half under clamping force

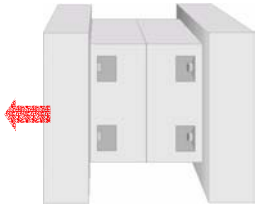


**Figure 4.7**
Remove crane, mould can be opened

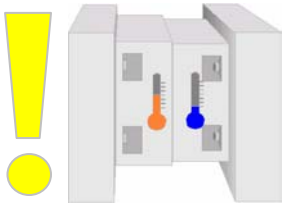


**Figure 4.8**
Avoid temperature differences of the mould halves

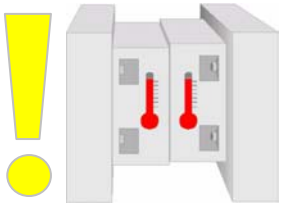


**Figure 4.9**
High operating temperature can lead to displacement of the mould halves

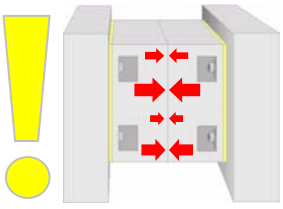


**Figure 4.10**
Unparallel insulating plates cause bad pressing distribution

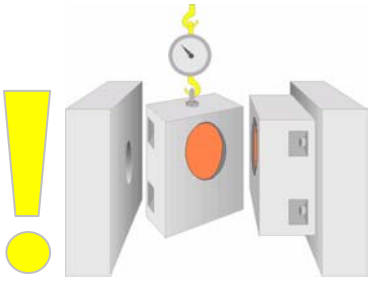


**Figure 4.11**
Avoid eccentrically arranged cavities

### Figure 4.1

Clean the assembly surfaces of the mould fixing platens and of the mould and possibly pull off with an oil rubber. The contact surfaces must be clean and grease-free, good friction closing must be enabled, do not enclose grease-proof paper, only quite slight oiling for the purpose of corrosion protection (possibly rust protection spray) can occur.

### Figure 4.2

Bring in that mould half which shows the (more exact) centring carrier in the machine and apply on the mould fixing platen provided for this purpose, this is in the normal case the fixed mould half. Pay attention that the mould hangs on the crane beautifully straight, by no means the mould should hang inclined

so that it is applied on the upper side and on the underside a gap exists. A contrary hanging inclined would be less problematic as by a slight pulling inclined with the crane towards the mould fixing platen the mould can be applied full-area. Introduce the centring carrier in the centring hole of the mould fixing platen, align the mould rotationally by means of a water level and tighten on this side still hanging on the crane. When a rotary centring (torsion safety) is provided, this must also be installed on this side.

**Figure 4.3**

Bring in the other mould half in the machine with the crane, best by means of a crane balance and apply on the second (normally on the moving mould half) mould fixing platen if possible centrally.

**Figure 4.4**

Close the moving mould fixing platen in the set-up mode, move with the crane in parallel to the closing movement and determine the mould height. The weight display on the crane balance should not change during the immersion of the guide columns, if necessary lift or lower slightly with the crane.

**Figure 4.5**

Afterwards build up and reduce clamping force again approx.3 times, but not opening the mould, only the clamping force should be reduced. At this alternate build-up and reduction of the clamping force both mould halves can fine-align to each other in the µm range. Prerequisite is that the mould still hangs exactly with its own weight on the crane. With tiebarless machines the display on the crane balance decreases due to the frame deformation and the lifting connected with it of the moving mould fixing platen from the guide rails, at the build-up of the clamping force a bit. This effect is somewhat bigger on the moving mould half than on the fixed mould half.

**Figure 4.6**

With built-up clamping force tighten the mould mounting screws on the moving mould half. The formula for the minimum screw-in depth reads: Screw diameter x 1.5. The quality of the screws should be 8.8 or 10.9, harder screws can, specially at cast mould fixing platens, represent a certain danger for the mounting thread. When a high speed mould mounting device is used, also clamping force must be built up before the moving-in of the clamping wedges.

**Figure 4.7**

Remove crane and connection bridge, afterwards the mould can be opened and/or connected and be put into operation.

**Figure 4.8**

Temperature differences of the two mould halves to each other lead to different thermal expansions and therefore to different dimensions. This can entail increased wear as well as displacement of the moulded parts on the mould parting surface.

**Figure 4.9**

When high mould temperatures are run, during the heating-up phase the not-centred mould half, due to the thermal expansion can leave its mid-position especially with unsymmetrical arrangement of the mounting points. The consequence would be a coaxial displacement of the two mould halves. In this case it is necessary to hang the not-centred half after the heating-up on the crane anew, to lift this half as exactly as possible with the own weight, to loosen the mounting screws of this half and to carry out the mounting procedure anew from item 4.5.

**Figure 4.10**

Possibly used insulating plates must show a good parallelism and constant wall thickness, deviations of >0.05 mm entail an uneven pressing distribution in the mould and can lead to overfeeding and flash formation on the moulded parts. Insulating plates are also subject to a certain wear, therefore parallelism and wall thickness should be checked specially when problems appear.

**Figure 4.11**

Eccentric arrangement of the cavities leads to higher demand on clamping force. The further the cavities are arranged unsymmetrical outside the means, the more clamping force is needed in order to avoid overfeeding. Therefore, at the layout of the mould, it should be attempted to arrange the cavities if possible symmetrically and near the means.

## 5. Check of the coaxiality of the two mould halves to each other

The coaxiality of the two mould halves to each other can be checked relatively simply according to the below method. For this purpose 3 magnet pillars with dial gauges must be fixed on the outside of that mould half which does not show the centring bolts, but the centring holes.

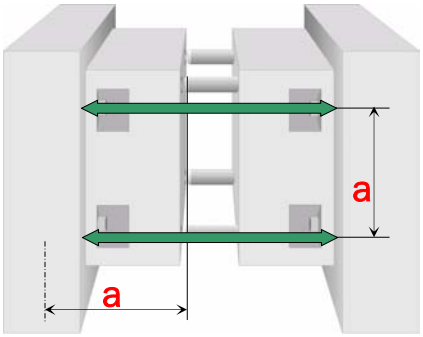



**Figure 5.1**
Close mould up to the guide bolts, measure platen parallelism

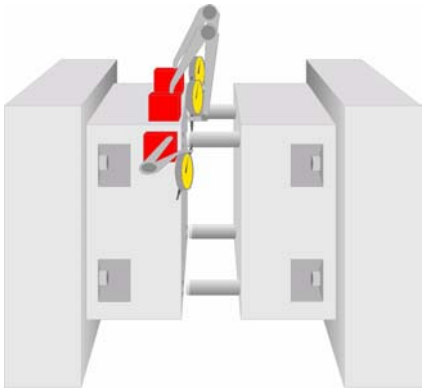


**Figure 5.2**
Build up dial gauge pillar, adjust dial gauges on guide bolts and set to zero

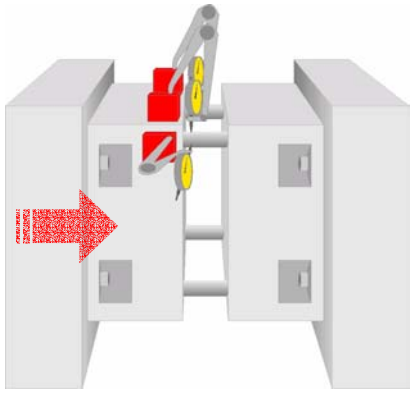


**Figure 5.3**
Close mould so far that guide bolts immerse. Read off dial gauges

**Figure 5.1**

Close the two mounted mould halves so far until the centring bolts are immediately before the immersion in the centring holes, no contact may result yet. Measure the platen parallelism on the operator side vertically, the distance of the measuring points should correspond approximately to the distance from the end of the guide bolts to the middle of the mould fixing platen on the moving mould half (Measure **a**). Note the parallelism measured values.

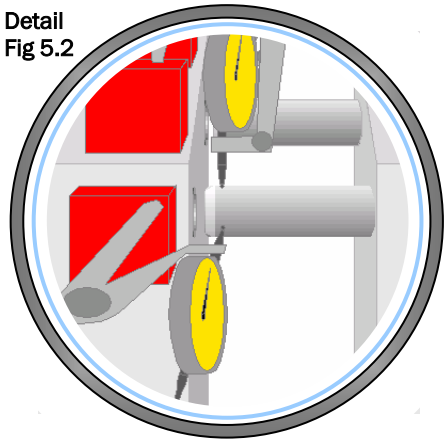
**Figure 5.2**

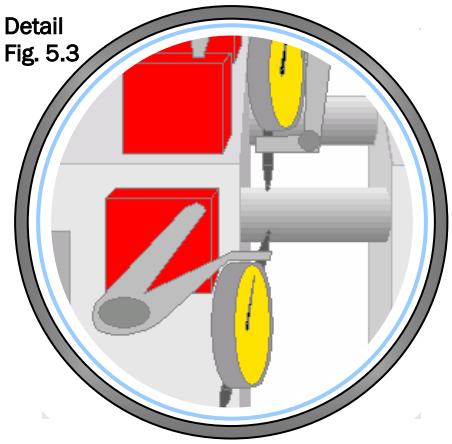
Directly over the two upper guide bores fix one magnet pillar each, in the figures standing beside it has been assumed that the bores are integrated into the moving mold half. If the bores should lie on the fixed mold half, the magnet pillars must also be fixed on the fixed mold half. Afterwards adjust the dial gauges on the respective upper side of the bolt being shortly before the immersion, and set the display to zero.

**Figure 5.3**

Close the mould in the set-up mode just so far that the guide bolts immerse in the guide bores. Here it must be paid attention to that the probe tips of the dial gauges do not come to stand on no grease groove of the guide bolts. Afterwards read off the dial gauges. From the read-off value of the two upper dial gauges deduct the parallelism value or add it depending on in which direction the platen parallelism shows (above tighter or further).

Example: After the immersion of the bolts the upper dial gauges show a value of +0.1 mm, the measuring button is ‚pressed in', this means the bolts are lifted, which in turn means that the mould half with the bores (in this case the fixed mould half) would lie too high. When now the platen parallelism above would be by 0.03 mm farer than below, from the measured immersion value of 0.1 mm these 0.03 mm would have to be deducted. This would yield a vertical displacement, due to the mounting, of 0.07 mm. A value of under 0.05 mm would be okay, from 0.1 mm already wear on the guide columns begins.




## 6. Influence of the injection moulding machine on the closing behaviour of the mould

Different mould clamping mechanisms of injection moulding machines can have different influences on the closing behaviour of the mould. Among others the following items are important:

- A good platen parallelism of the machine is important for a clean, wear-free closing of the mould. At clamping force build-up the mould halves are applied on the mould parting surface in each case, with good platen parallelism the tilting is less than with bad platen parallelism.

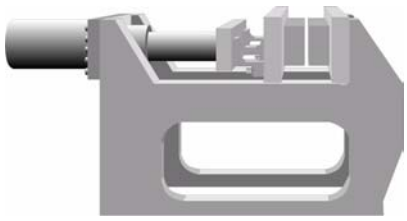
- The stiffness of the frame has consequences on the straightness of the guides and hence on the straightness of the closing movement. Under the load of a heavy, moving mould half a soft frame deforms itself stronger than a very stiff frame.

- At a centring on both sides of the mould the accuracy of the concentricity of the centring holes in the mould fixing platens plays a decisive role.

## Consideration of different mould clamping mechanisms

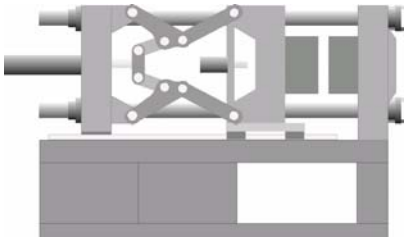
ENGEL tiebarless machine

The platen parallelism and concentricity of the centring holes of an ENGEL tiebarless machine can be set and are adjusted optimally at each machine. The frame is in a position to receive the whole clamping force. The load by the weight of the moving mold half and the frame deformation resulting from it is disappearingly small in comparison to the clamping force. During the mould closing process the frame is therefore hardly deformed, platen parallelism, concentricity and guide accuracy remain guaranteed optimally until the application of the mould



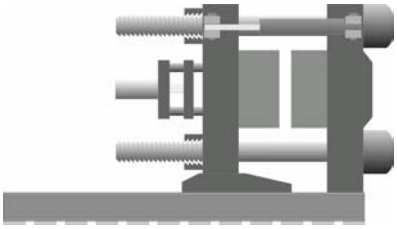
ENGEL toggle lever machine

Also on an ENGEL toggle lever machine the platen parallelism and concentricity of the centring holes can be set via the adjustable support of the moving mould fixing platen. The machine frame is executed in a rigid welding design, by the double support on the exact rail guide the moving mould fixing platen is guided very precisely and tilting-free, and the frame deflection is minimized.



ENGEL DUO machine

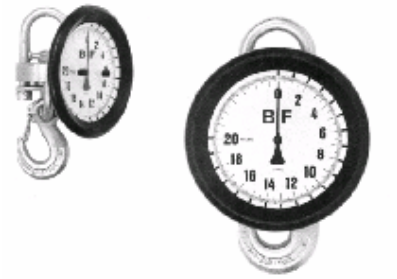
The large machines from ENGEL are executed in 2-platen construction and are called DUO machines. Also on this machine type the platen parallelism and concentricity of the centring holes can be set via the adjustable support of the moving mould fixing platen. The machine frame lies on a big number of very stable machine support pads, the especially long support on the stiff guide way guarantees the very precise and tilting-free movement of the moving mould fixing platen.



*Regardless of the used machine type it is important to mount the 2 mould halves as exactly as possible concentrically to each other.*

## 7. For the mould installation suitable crane balance

For mould installation there are suitable crane balances on the market, both electronic and mechanical types. The device mentioned below is an economical, robust type and can be recommended. The type to be selected depends on the maximum mould weight. The purchase and the use of a crane balance can be justified very quickly by improved mould working life.



Pointer crane balance type BF-ZK:

- Hydraulic, maintenance-free measuring system
- Contrast-rich, well readable scales

**Australia:**
P O Box 1012, Mascot, NSW 1460, Sydney
Ph: 1-800 148 791 Fx: 1-800 148 799
sales@techspanonline.com www.techspanonline.com

**New Zealand:**
P O Box 15-262, New Lynn, Auckland
Ph: ++64 (09) 8276567 Fx: ++64 (09) 827 6596
sales@techspanonline.com www.techspanonline.com

- Rubber sleeve-safety protection
- Stable cast housing
- Plexiglass cover for the protection for
- pointer and dial (clock) face
- Zero tare'ing
- Precision 1 % of the scales end value
- Safety: 5-fold nominal load
- Diameter dial (clock) face 160 mm
- 12 mm figures height
- Hook with safety flap

| Carrying force in kg | Scales division kg | Own weight kg | Order No. | Length mm |
|---|---|---|---|---|
| 200 | 1 | 5 | **WBF-ZK/200** | 230 |
| 500 | 2 | 5 | **WBF-ZK/500** | 230 |
| 750 | 5 | 5 | **WBF-ZK/750** | 230 |
| 1.250 | 5 | 5 | **WBF-ZK/1250** | 230 |
| 2.000 | 10 | 5 | **WBF-ZK/2000** | 230 |
| 3.200 | 20 | 5,5 | **WBF-ZK/3200** | 280 |
| 5.000 | 20 | 6,5 | **WBF-ZK/5000** | 300 |
| 12.500 | 50 | 7 | **WBF-ZK/12500** | 215 |
| 25.000 | 100 | 12,5 | **WBF-ZK/25000** | 262 |
| 50.000 | 200 | 25 | **WBF-ZK/50000** | 335 |

This guideline shall ensure an as optimum as possible mounting of moulds, also by differently trained personnel. As a result signs of wear on guide pins and flat centring devices, often also on cores and inserts as well as parts displacement and flash formation can be avoided or at least be decreased considerably. Normal mould wear whose reason lies in the injection process, material, faulty mould accuracy or similar, cannot be prevented by the correct mounting, but best be restricted.

Subject to changes and additions.

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Version 0 / 03.04.2006, G. Wimbauer