

The inventor of the PP membrane filter element.  
The global market leader in membrane and  
recessed filter elements. Your expert in solid-  
liquid filtration. LENSER®.

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# Company

## Leading manufacturer since 1969

LENSER is the world's leading manufacturer of filter elements for solid-liquid separation. As an expert, LENSER has long had an excellent reputation in this field. To this day, polypropylene membrane filter elements, invented by LENSER, represent the optimum technology in solid-liquid separation with filter presses. LENSER's Research & Development department builds on these years of experience and continually refines LENSER filter elements to meet new requirements. Our broad product range and far-reaching industry knowledge make us a valued partner worldwide in solid-fluid separation.

## Our production processes

LENSER exclusively manufactures filter elements using the pressing method on program-controlled presses. This guarantees high repeatability, consistent quality and warp-free filter elements. In contrast to other manufacturing methods, pressing does not produce any weld lines with lower stability, which can lead to breaks in the filter elements. Production of thin-wall membranes with the necessary flexibility is only possible using the pressing method. LENSER filter elements also differ in their materials: for polypropylene membranes, for example, the company uses polypropylenes developed in-house. The result: consistently successful filtration.



# Areas of application

## Chemicals

Aluminium oxide, fuller's earth, colourings, enzymes, phosphates, pigments, silicates, titanium dioxide, zeolite etc.



## Food

Agar-agar, beer, biofuels, fats, gelatine, yeast, oils, palm oil, proteins, starches, wine, sugar etc.



## Mining

Aluminium, lead, iron, earths, gold, coal, copper, nickel, pyrite, noble earths, silver, uranium, zinc etc.



## Minerals

Fuller's earth, gypsum, potash salts, potassium carbonate, kaolin, chalk, lithium chloride, phosphate, porcelain and ceramic materials, clay etc.



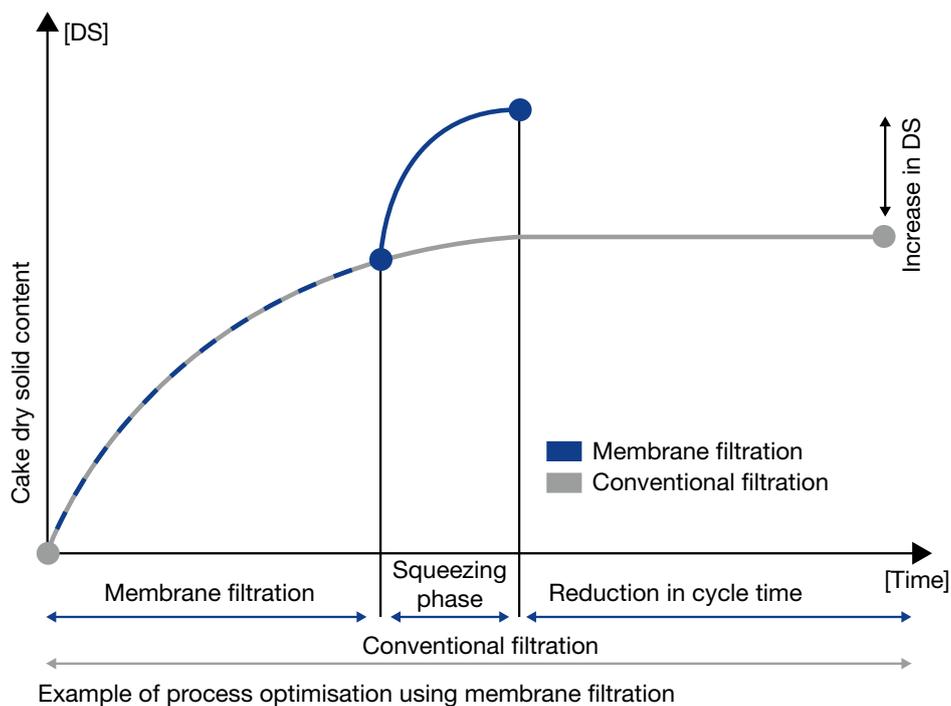
## Sludge

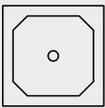
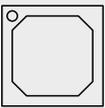
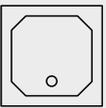
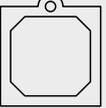
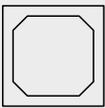
De-hydrating of industrial and municipal wastewater sludge etc.



# LENSER® membrane filter elements KM

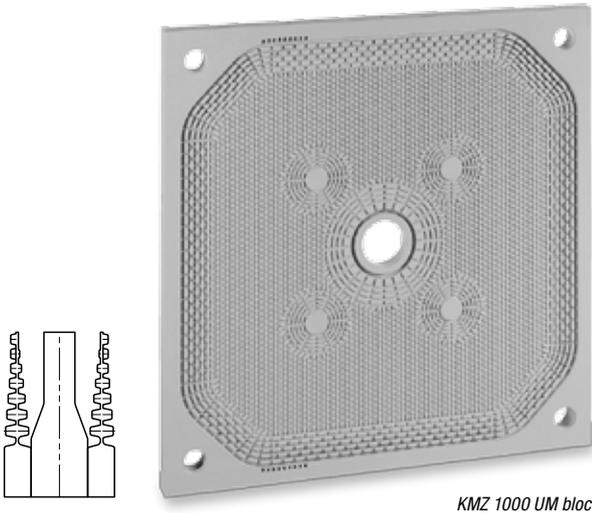
LENSER membrane filter elements facilitate mechanical squeezing of the filter cake after the actual filtration process.



Advantages		Sizes
<ul style="list-style-type: none"> <li>• Energy cost saving</li> <li>• Higher throughput rate</li> <li>• Higher dry solids content</li> <li>• Shorter filtration cycles</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced water usage due to shorter wash times</li> <li>• Improved wash results</li> <li>• Reduced air consumption with blow-drying</li> </ul>	<ul style="list-style-type: none"> <li>• from 470 mm to 2,440 mm</li> <li>• 2,000 mm x 3,000 mm</li> </ul>
Feed port position		
 centre	 corner	 top or bottom
		 external
Versions		
 C		

# Welded membranes **KM** UM bloc, **KM** bloc

## **KM** UM bloc

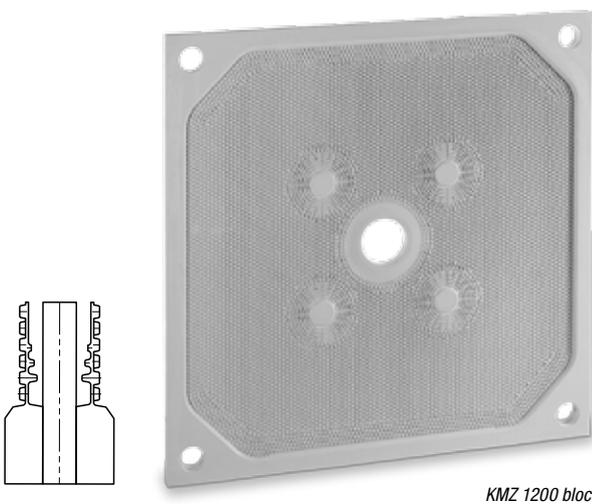


The UM bloc design features ridge lines stepped to double pip height at the edges.

### Advantages

High operating security, as the UM membrane also tolerates squeezing in a chamber that has been poorly filled or left empty by mistake.

## **KM** bloc

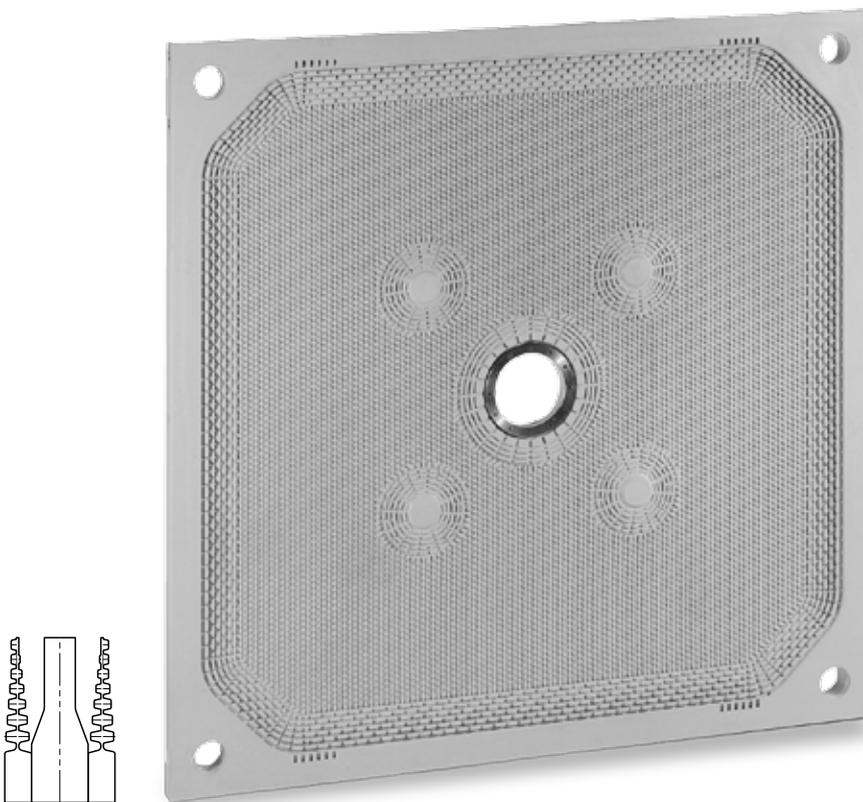


The recessed membrane facilitates even cake thickness and a good wash result.

## Welded high-pressure membranes **KM UM HD bloc**

High-pressure membrane filter elements KM, HD (HD = high pressure) are extremely resilient. These filter elements withstand squeezing pressures up to 30 bar thanks to their special feed port designs and material combinations.

### **KM UM HD bloc**



*KMZ 1500 UM HD bloc*

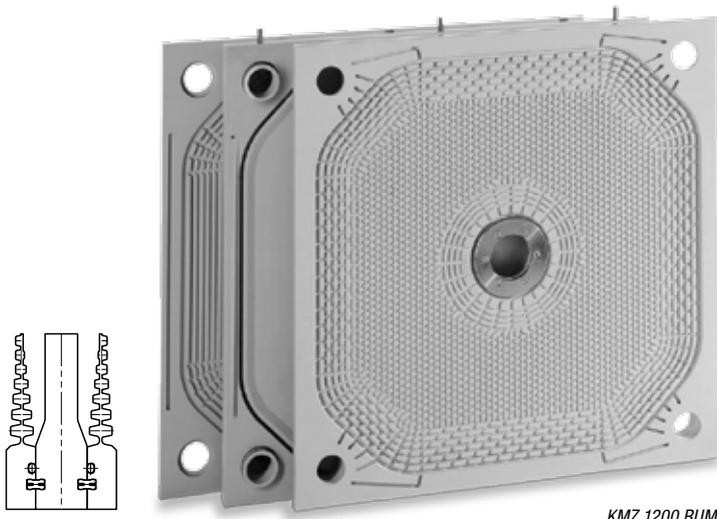
#### Advantages

- Squeeze pressure possible up to 30 bar

# Exchangeable membranes **KM RUM, KM RUD**

Exchangeable membrane filter elements facilitate simple membrane exchange. This means that you only have to replace the membrane rather than the complete filter element when the filter element is worn out. The body plate is retained.

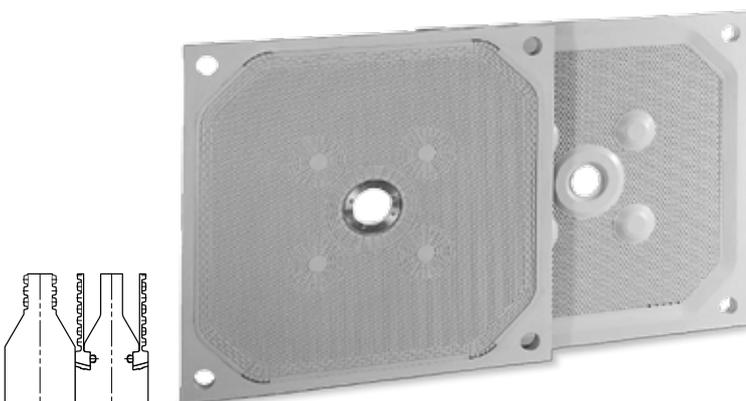
## **KM RUM**



*KMZ 1200 RUM*

The membrane halves on the KM RUM design are fixed to the carrier plate using clip strips.

## **KM RUD**



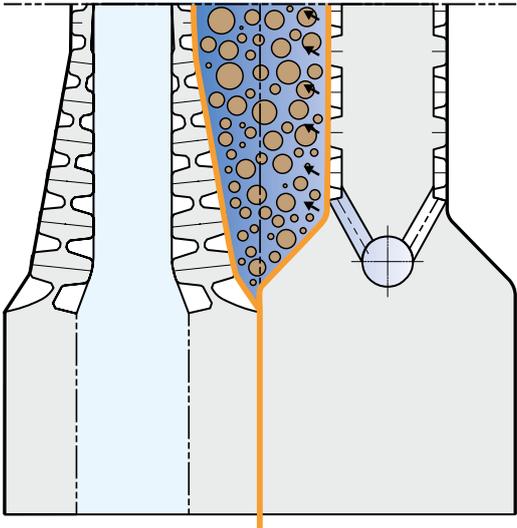
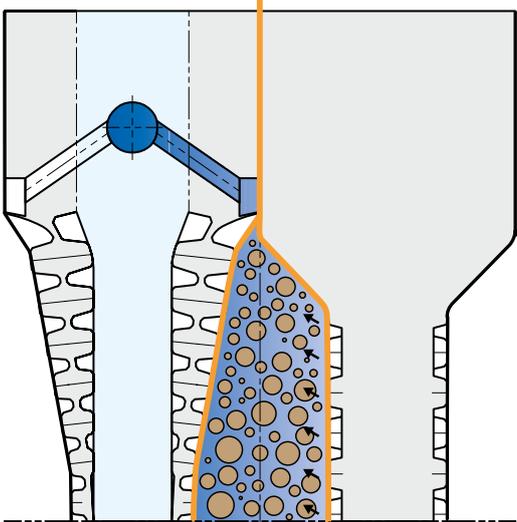
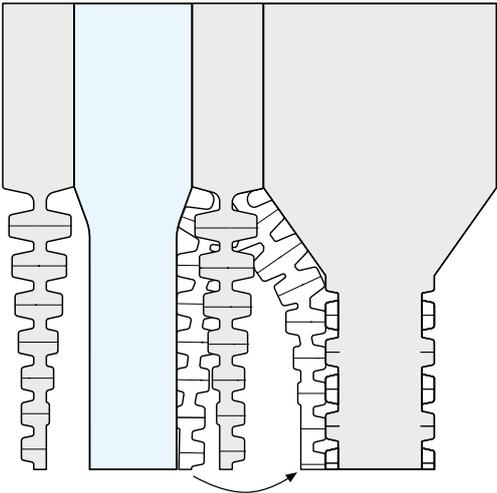
*KMZ 1200 RUD*

The membrane halves on the KM RUD design are fixed with clamping strips in the grooves of the membrane body plate designed for this purpose.

The KM RUD may exclusively be used as a mixed pack (MIXPACK) in combination with recessed filter elements.

# LENSER® mixed pack X

Pack of recessed and membrane filter elements.



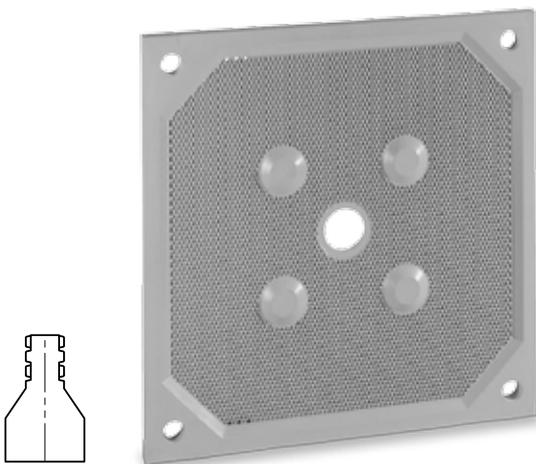
- Advantages
- Cost reduction by combining recessed and membrane filter elements

# LENSER® recessed filter elements K

Recessed filter elements represent efficient standard equipment for filtration processes with low dry solids content requirements. LENSER supplies them in different sizes and materials for open and closed discharge.

## KF

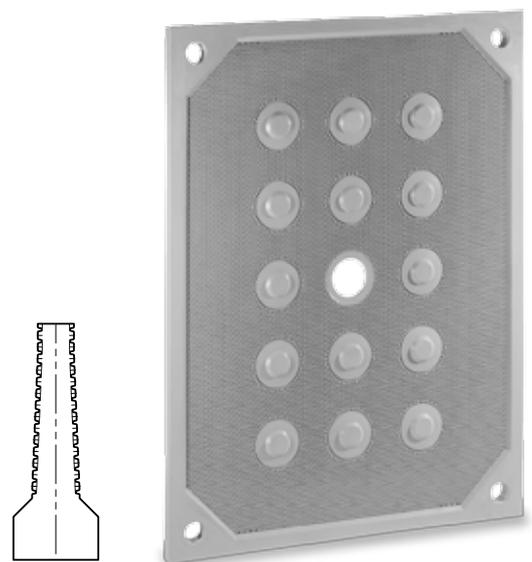
Recessed filter element, standard



KFZ 1200 C

## KA

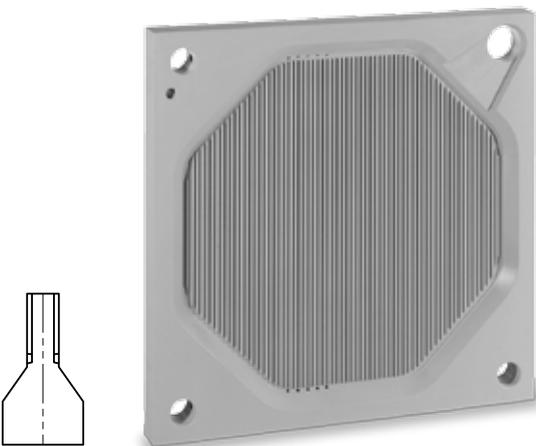
Recessed filter element, reinforced edge



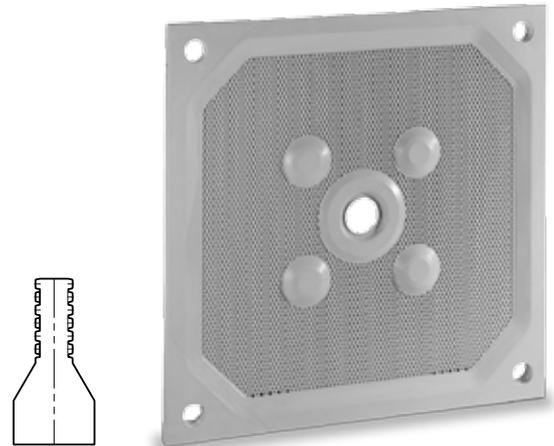
KAZ 1500 x 2000 C +

## KX

Recessed filter element for mixed packs



KXE 800



KXZ 1200

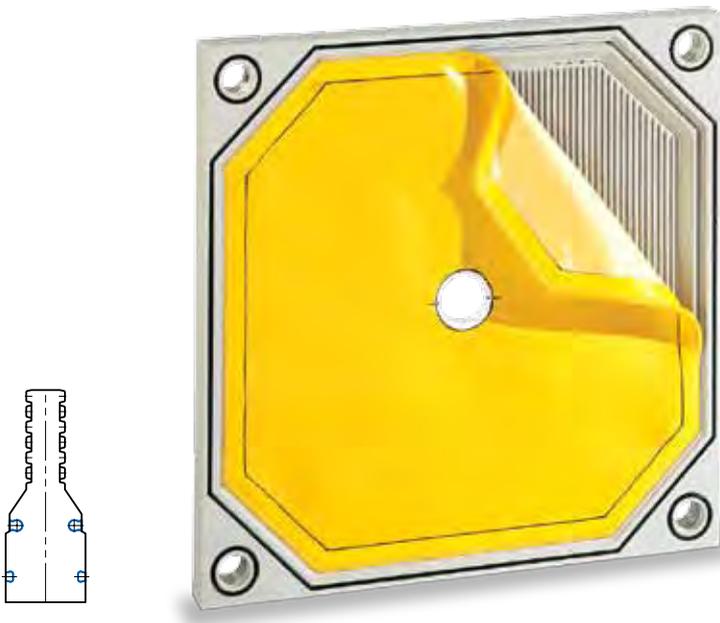
Designs suitable for LENSER membrane filter elements

# LENSER® sealed filter elements **CGR**

Gasketed filter elements CGR (caulked-grooved) are used if the filter chambers have to be leak-proof.

LENSER offers an array of sealing materials depending on individual requirements, such as EPDM, silicone, NBR and viton.

We also use FDA-compliant seals for the food and pharmaceuticals sector.



*Gaskets for recessed filter element*

# LENSER® filter plates and frames F

Filter plates and frames are a popular solution for special processes. We manufacture these to your requirements in many different formats and designs.



FPR 1000 D

**FP** Filter plate element

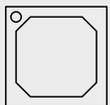
**FR** Filter frame element

**FX** Filter plate element for mixed pack

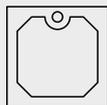
## Sizes

from 470 mm to 2,440 mm

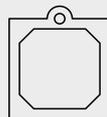
## Feed port position



corner

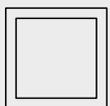


off-centre

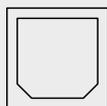


external

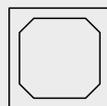
## Versions



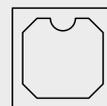
A



B



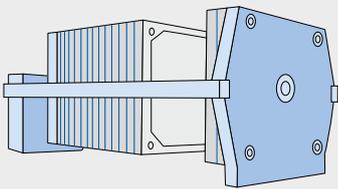
C



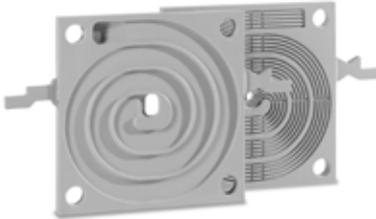
D

# LENSER® custom-designed filter elements

We manufacture custom-designed filter elements tailored to the customer's specific requirements. The advantages of LENSER custom-designed filter elements: low weight, high stability, chemical resistance and almost no maintenance.



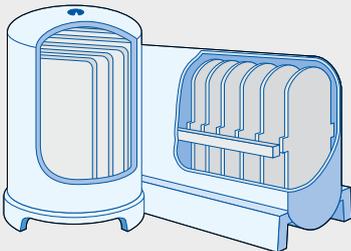
Filter presses



Thickener plate



Special recessed filter elements



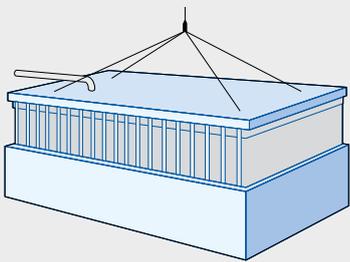
Pressure tank



Incl. System Kelly, Leaf, Niagara



e.g. System Sparkler



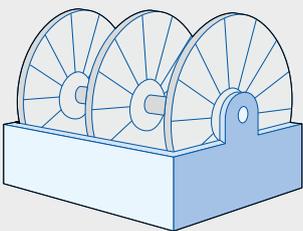
Vacuum tank filter



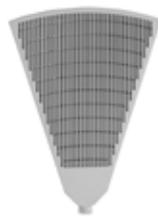
e.g. System Moore



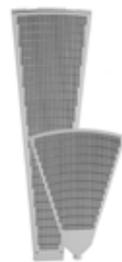
e.g. tank filter



Vacuum rotary filter



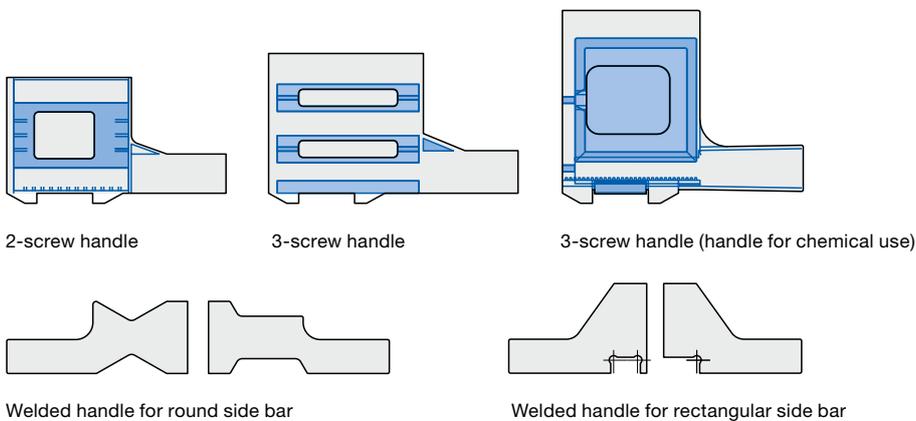
Disc filter



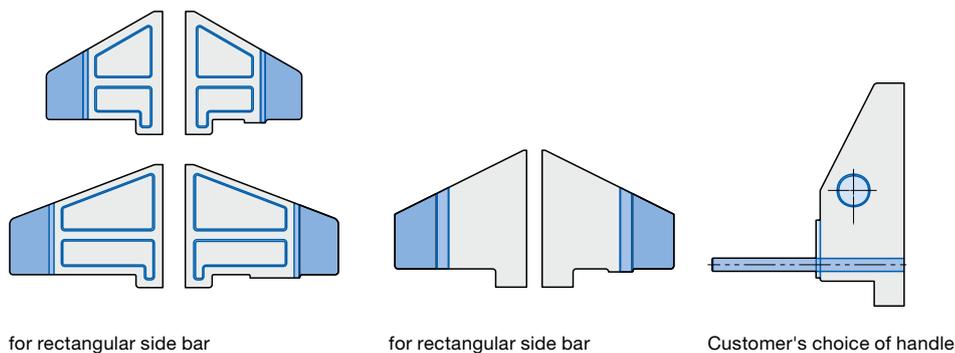
e.g. System Voith

LENSER accessories for filter elements are manufactured and continually optimised based on our experience of daily use. The pictures below just represent a selection of our current accessories. We offer other accessories on request.

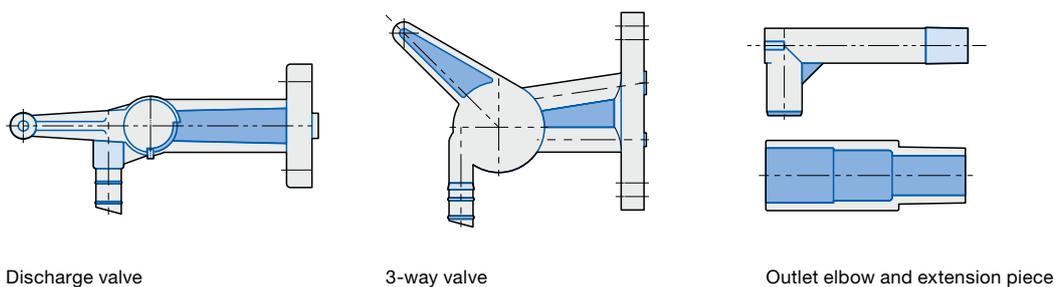
## Handles for manual plate shifting



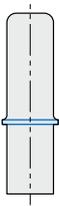
## Welded handles for automatic plate shifting



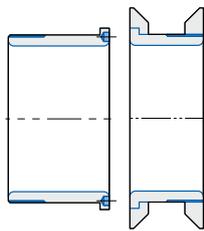
## Discharge systems



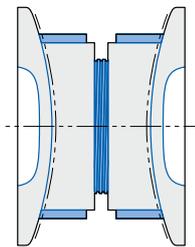
## Cloth clamping devices



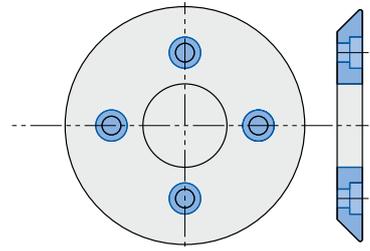
Cloth dog



Cloth locking grommet for centre feed port

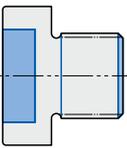


Cloth locking grommet for corner feed port

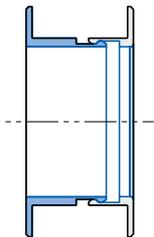


Cloth clamping ring for head and end plates for 1/2 cloths

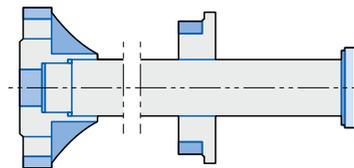
## Other



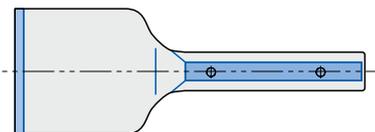
Locking screw for discharge holes on head and end plates



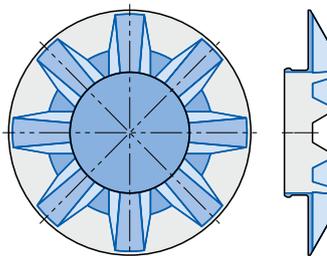
Cloth protection grommet



Connection system



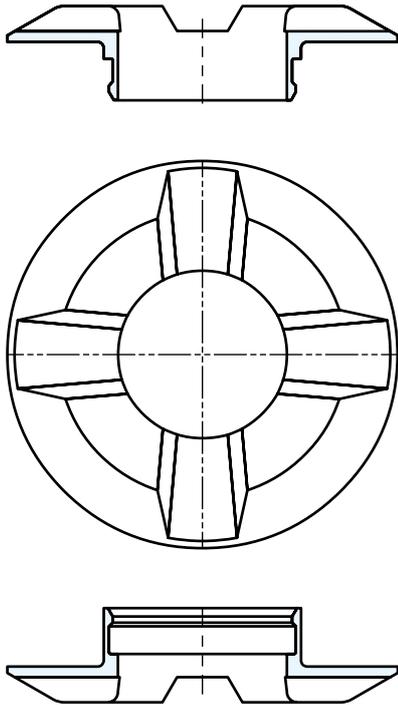
Cake scraper



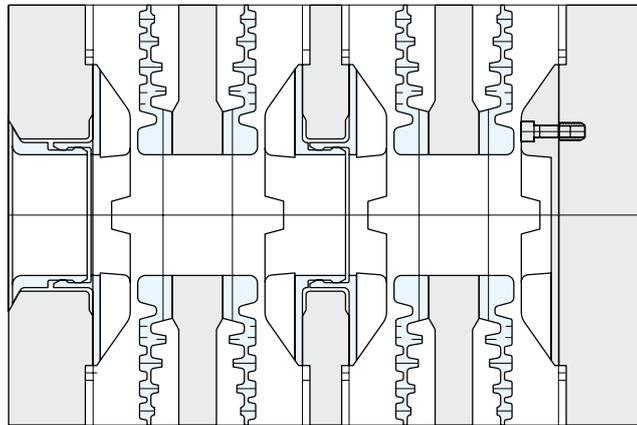
Support/distribution ring

# LENSER® support/distribution rings

We recommend the use of LENSER support/distribution rings for critical applications with extremely low filter cake build-up.



*Support/distribution ring*



*Plate pack of membrane and recessed filter elements with support/distribution rings*

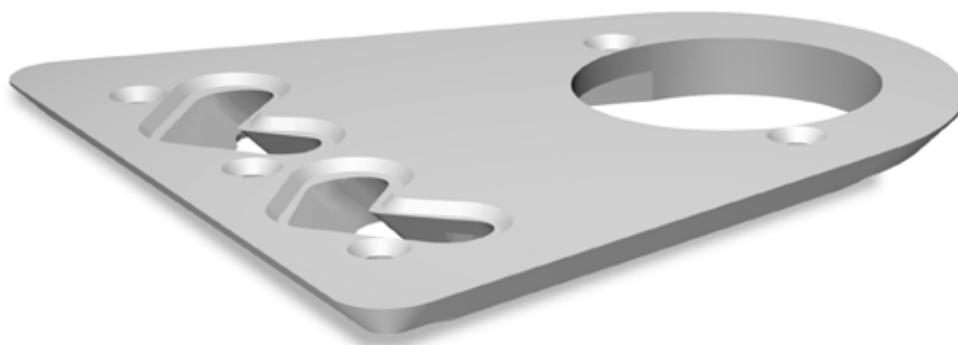
## Advantages

- Prevents feed port gap changes
- Reduces the risk of pressure differences
- Supports even cake build-up
- Supports the membranes and, thus, extends service life
- No need to coat the cloth neck – no filtration in the feed channel

## LENSER® feed shoes

The latest generation of LENSER feed shoes facilitate smooth operation of the filter presses thanks to their innovative design.

Using tried and tested materials – e.g. PP and PVDF – they cover almost all eventualities in terms of chemical resistance.



### Advantages

- No risk of pressure differences in the filter chambers, because no blockages can occur in the slurry supply. This guarantees a free flow for the subsequent filtration cycle.
- Smooth outer contour with continued bevelled sealing edge, suitable for the Lenser KX recessed filter elements
- No dead angles ("dirty corners")
- With mixed plate packs (membrane and recessed filter elements) the membranes are not stressed or distorted during the squeezing process. Combined with the improved filter cake build-up in the feed port area, extends the service life of the membranes.
- Simple assembly and safe handling due to use of non-variable parts

## Support/distribution ring



*Reliable protection of your filter elements in the feed area*

## Cloth locking ring



*For quick and easy fitting of filter cloths*

## Specifications

Size:	from $\varnothing$ 80 mm
Design:	standard/custom-designed as required
Material:	Polypropylene for operating temperatures of $-10\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$ , other materials on request
Chem. resistance:	See the LENSER operating manual
Retrofitting:	Possible on existing plate packs
Filter cloth design:	Barrel neck cloths and overhang cloths

## Advantages

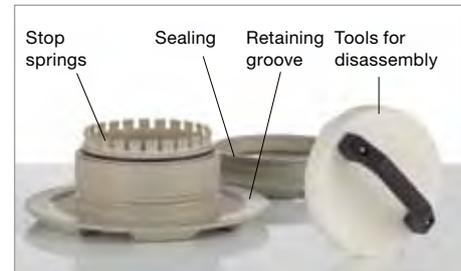
Reduced personnel costs:	<ul style="list-style-type: none"> <li>• Quick and easy fitting without tools thanks to the newly developed Fix-Click connection</li> <li>• One-person operation</li> <li>• No clogging of threaded parts by solids</li> </ul>
Lower operating costs:	<ul style="list-style-type: none"> <li>• Facilitates use of overhang cloths instead of barrel neck cloths</li> <li>• Secure hold and precise positioning of the cloth</li> <li>• Use of standard components, reduced downtime when replacing cloths</li> </ul>
Greater profitability:	<ul style="list-style-type: none"> <li>• Reliable protection of the membrane filter elements in the feed area = extended service life of your membrane filter elements</li> <li>• Protects against cake build-up in the feed area</li> <li>• Protects the filter cloth against abrasive media in the feed area</li> </ul>

## Instructions for use

1. Connect one ring component firmly to the pipe section. Place the ring component on a flat surface and position the pipe section on the ring component. Press down on the pipe section evenly and firmly until the stop springs on the pipe section engage with the ring.

**Warning:** To protect the stop springs on the pipe section do not place them directly on the surface and do not fit the ring component from above (risk of breakage).

2. Insert the connected parts (pipe and ring components) into the feed canal on the filter cloth until the O-ring sewn in around the feed port is securely positioned in the retaining groove of the ring component. Then push the ring and cloth together into the feed canal on the filter element.
3. Push the second ring component into the feed canal on the filter cloth on the opposite side of the filter plate until the O-ring is securely positioned in the retaining groove of the ring component. Then press to engage in position using the counterpart in the feed canal on the filter element. The filter element is ready for use.



## Disassembly

1. Insert the opening tool into the cutout sections on the ring component using both lugs.
2. Press the tool firmly against the ring to detach the stop springs from the counterpart.
3. Maintain the pressure and rotate the tool by 15–30°. In this position, remove the tool including the ring.
4. Then remove the ring from the cloth. The counterpart with ring component can also be removed from the feed canal on the filter element and from the cloth.



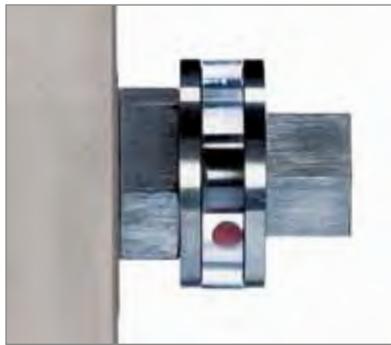
# LENSER® Control System LCS

You can monitor the squeezing process effectively with the patented LENSER Control System (LCS). The LCS system detects any membrane leakages immediately and displays the current compression status of the filter cake.

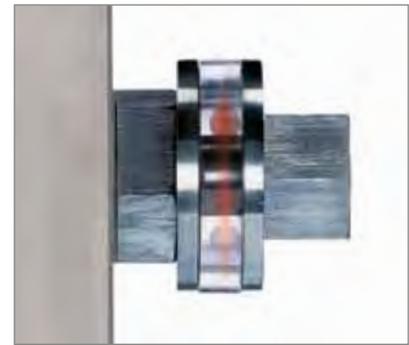
During the squeezing process the squeezing medium flows behind the membrane, i.e. the ball rotates. The cake has reached maximum compression and the membrane is tight once the ball is still. If the membrane is not tight or is damaged, then the ball would continue to turn. The LCS system can also be retrofitted.



*LCS in installed state*



*No flow: membrane is tight and the cake has reached maximum compression*



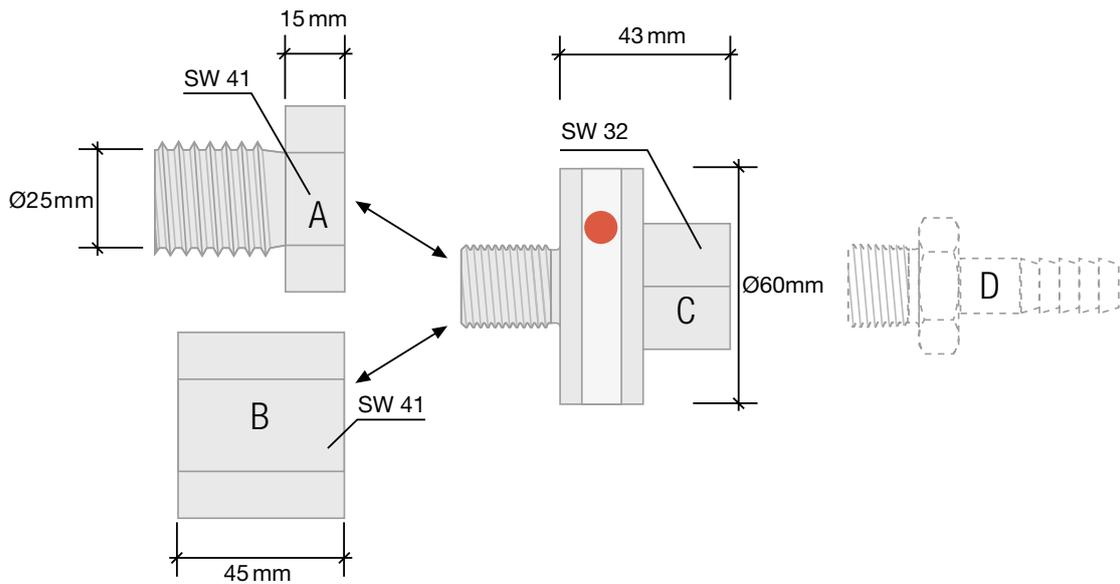
*With flow: squeezing medium flows behind the membrane.*

## Advantages

- Detects leakages under real operating conditions
- Improves operational reliability
- Reduces downtime
- Displays filter cake compression status
- Durable thanks to robust, simple mechanics

## Technical features

- Stainless steel ( 1.4305/V2A)
- Open flow in both directions
- Visual flow display
- Easy cleaning (if required)
- Easy installation
- Suitable for 30 bar squeezing pressure
- Suitable for squeezing medium of water, oil or air



A	C	D
<p>Connection piece for filter element:            Internal thread: R 1/2"            LENSER standard for PP            Material: 1.4305 (V2A)            Part no.: 52160</p>	<p>Connection piece for manifold:            Internal thread: R 1/2"            Length: 45 mm, SW 41            Material: 1.4305 (V2A)            Part no.: 54695</p>	<p>LENSER Control System (LCS):            Internal thread: R 1/2"            Outer thread: R 1/2"            Material: 1.4305 (V2A)            Part no.: 42102 (up to 40 °C)            Part no.: 54698 (up to 95 °C)</p>
<p><b>B (alternative)</b></p>		
<p>Plant-dependent connection for squeezing medium:            Not included in the scope of delivery</p>		<p>Recommendation:            Order with connection piece.            One LCS for each membrane filter element.</p>

# Service, switch to LENSER® filter elements



## Best possible support

We want to offer you the best possible support on all issues related to the filtration process. Thanks to our years' experience in many different fields, we are able to give you reliable recommendations on the right process equipment and on suitable filter elements. We utilise Filos® software to perform technical process analyses. We rely on the FEM method for the design process.

## Process analysis

We perform filter tests under original conditions in our lab and at your site to optimise your filtration process. We offer this service worldwide.

## Commissioning

Our team will be happy to help if you need any assistance with the commissioning of your new filter elements.

## Training

We are happy to offer training for your staff on filtration processes, depending on your needs and requirements.

## Switch to LENSER® filter elements

If your filter presses are not yet equipped with LENSER filter elements and you would like to convert some or all of your elements to LENSER elements, then we will review the necessary requirements for you and prepare a realisation concept. We'd be happy to advise you personally.

# LENSER® materials for filter elements

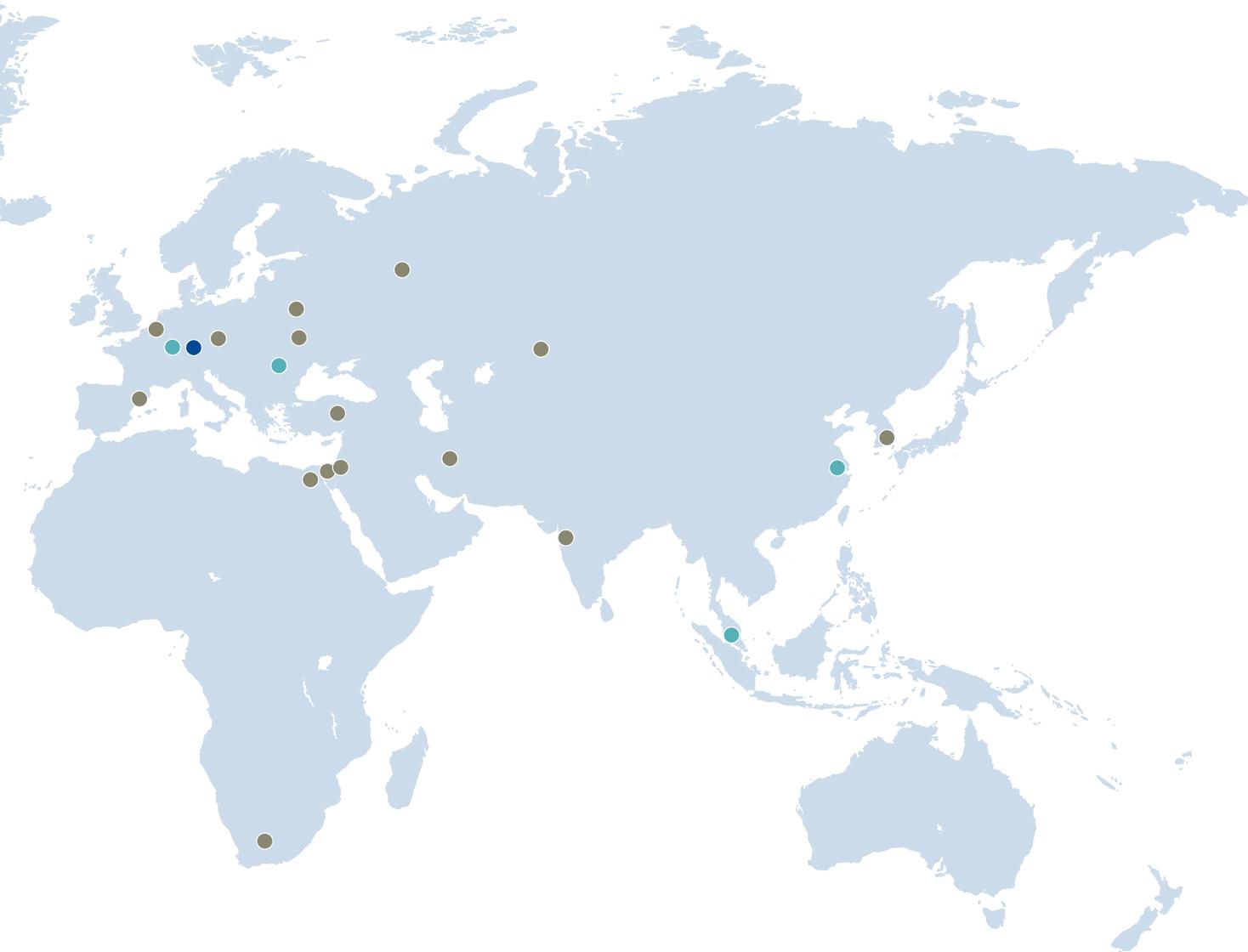
PPH	Polypropylene homopolymer, high-heat stabilisation
PPHCu	Polypropylene homopolymer, non-ageing in high heat, copper-stabilised (resistant to Cu, Co, Mn)
PPHs	Polypropylene homopolymer, non-ageing in high heat and extremely extraction-stable in hot aqueous solutions
PPC	Flexible polypropylene copolymer, non-ageing in high heat and extremely extraction-stable in hot aqueous solutions
PPCb	Polypropylene copolymer with basic stabilisation
PPCh	Polypropylene copolymer, non-ageing in high heat and extremely extraction-stable in hot aqueous solutions
PPCCu	Polypropylene copolymer, non-ageing in high heat, copper-stabilised (resistant to Cu, Co, Mn)
PPCAS	Polypropylene antistatic fitted
PVDF	Polyvinylidene fluoride
NBR	Nitrile butadiene rubber
TPE	Thermoplastic elastomer
Aluminium	
Stainless steel	
PE	Polyethylene

Other material combinations on request.

Do you require filter elements for use in an explosive atmosphere in accordance with ATEX Directive 94/9/EC? LENSER is a certified manufacturer of filter elements capable of electrostatic discharge from equipment category 2G in explosion protection zone 1. We confirm the filter elements' conformity with the ATEX Directive by issuing an appropriate certificate.



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