

... WS 85 Programms





Wire screens in ballast processing



WS 85 in sand and gravel processing



WS 85 in crushed aggregate processing



Polyurethane screens in primary screening

Screening...

...behind every passion there is a driving force – this is ours.

We aim to offer the most successful screens. Whilst constantly searching for new and better solutions we do not follow short-lived trends, but build on our experience.

History of the screen

The oldest screens known consisted of wooden bars and finer screens of horse hair. The first exact proof for the use of wire as grids goes back to 1556. It was used to process ore. The first patents for this purpose were registered in France in 1821.

Louis Herrmann in Dresden specialised in producing industrial screens since 1838. This company was pioneering in the development of screening processes – and was destroyed during the Second World War. HEIN LEHMANN was able to take over the most important employees after the collapse, and consequently all the rights and experience.

ISENMANN, founded in 1949, was taken over by HEIN LEHMANN in the mid 50s and thus was able to share HEIN LEHMANN's wealth of experience.

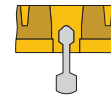
The plastic material polyurethane was developed by Bayer. The basic patents go back to 1937. The raw material basis of polyurethane materials is crude oil. The most important isocyanates for polyurethane are made from benzene and toluol.

There are very many of applications with this material. The first polyurethane screens were manufactured in the mid 60s.

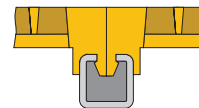
ISENMANN started manufacturing polyurethane screens in 1973:

- stretched tensioned versions
- flat versions
- flat screen panels in frames
- system screen panels

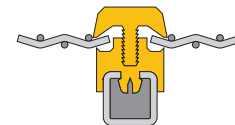
e.g.



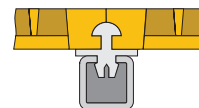
Interchangeable screen system "WS 43" since 1978



Interchangeable screen system "WS 80" since 1980



Interchangeable screen system "WS 83" since 1983



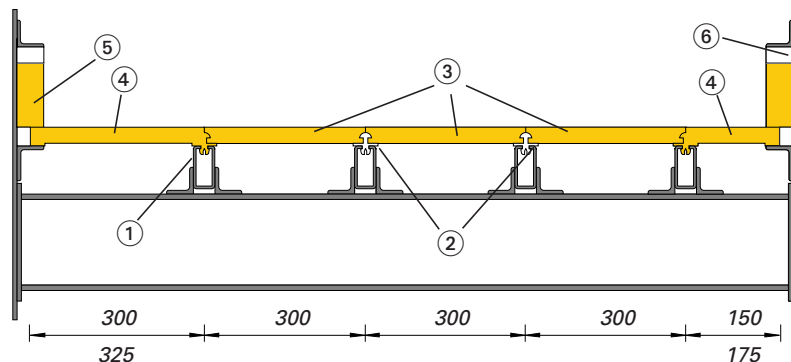
Interchangeable screen system "WS 85" since 1984
A very successful screening system backed by a great deal of experience.

Further developements are centred around this system with its typical dimensions.



The basic components of the WS 85 system

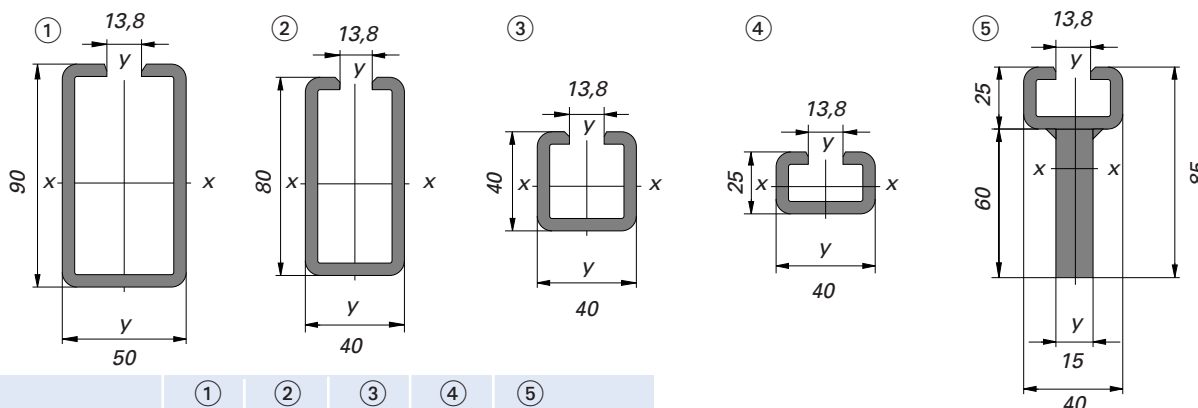
System cross-section



- ① WS support girder
- ② NOCKIN bar
- ③ Inside module type "J"
- ④ Outside module type "A"
- ⑤ Wedge bar for clamping
- ⑥ Wedge

The inside modules generally have a width of 300 mm. The system is adapted to any machine width with the outside modules. The standard lengths of the screen modules and the NOCKIN bars are 1000 mm. Further developments are generally centred around the standard dimensions.

Available WS 85 profile support girders

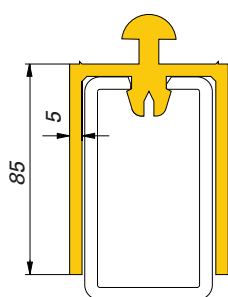


	①	②	③	④	⑤
Profile sizes	90x50	80x40	40x40	25x40	25x40 + 60x15
Weight (kg/m)	9,411	7,839	4,695	3,516	10,612
W_x (cm²)	23,819	16,233	4,963	2,197	18,363
W_y (cm²)	19,701	12,863	6,696	4,384	5,228
Length max.	8700	8700	6050	6050	6050

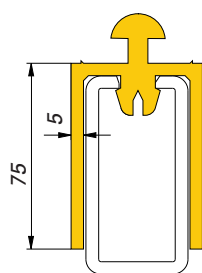
NOCKIN bars

NOCKIN bars with lateral protection

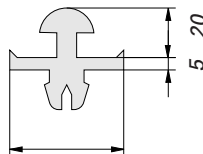
NOCKIN bars



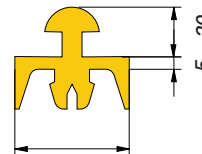
For profile 90x50



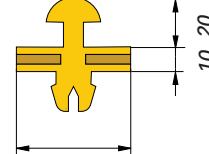
For profile 80x40



Standard

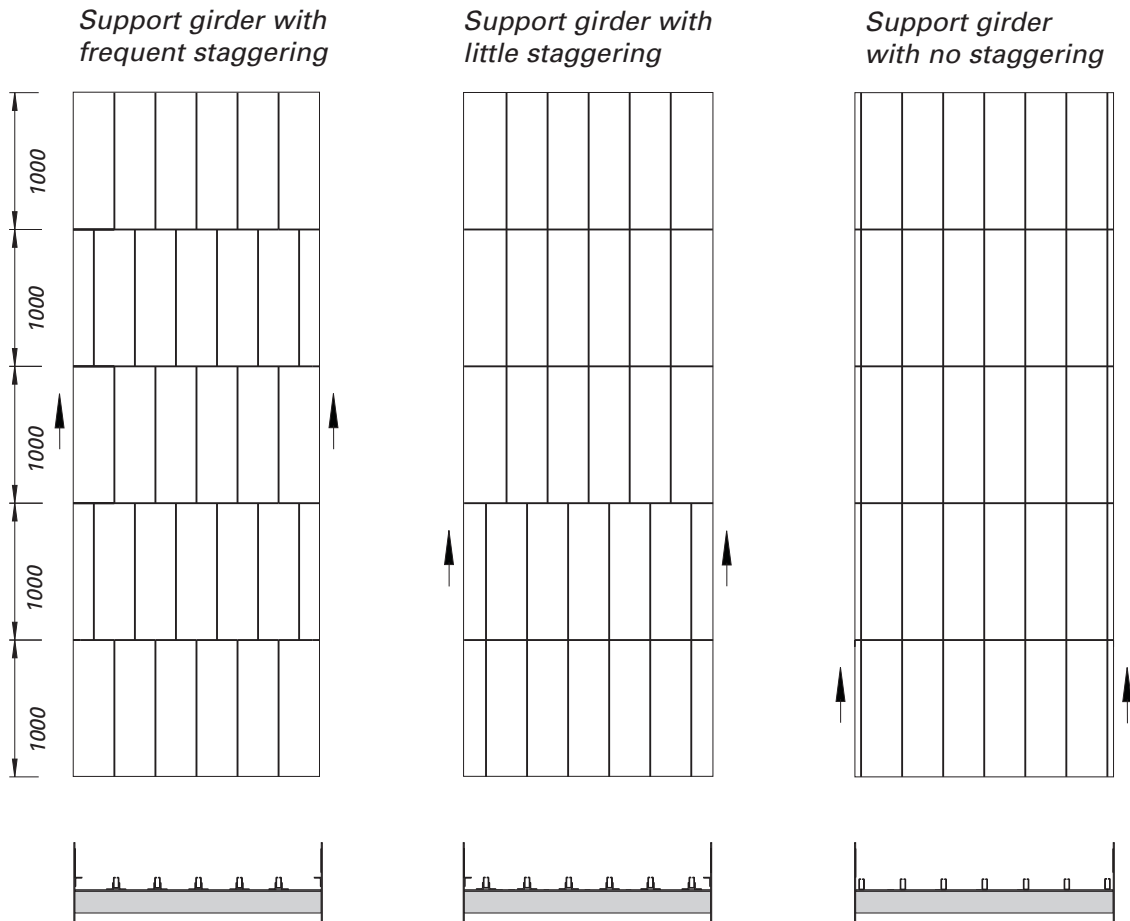


For special
dewatering
applications



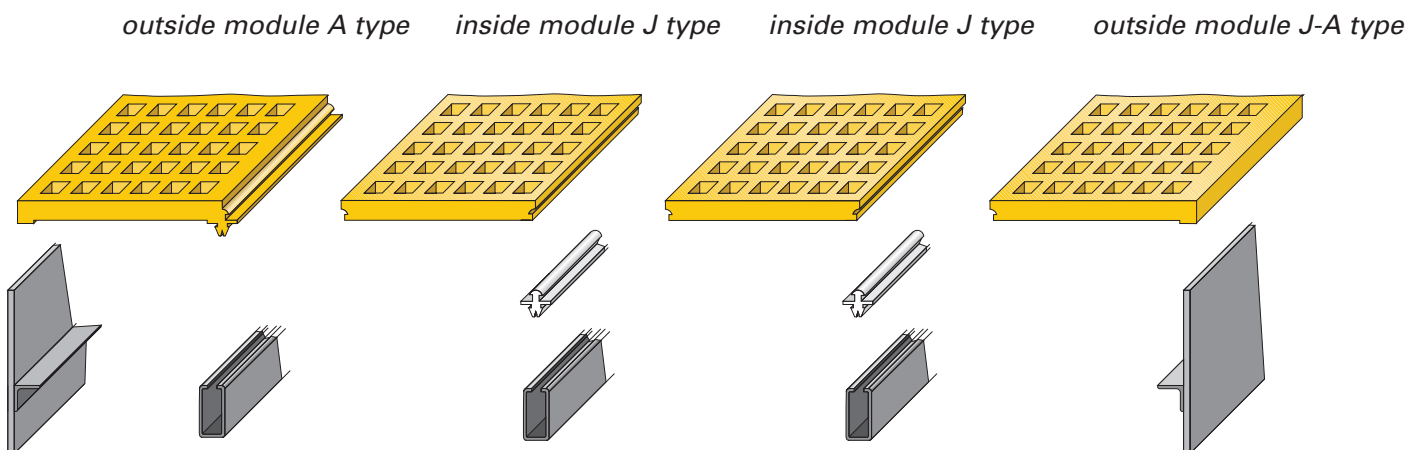
For ball trays

Possible WS support girder layouts



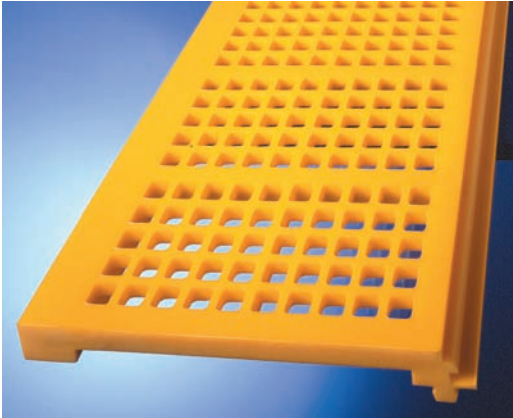
Each of the various support girder layouts has its advantages and disadvantages which is understood by those active in the field.

Screen module types

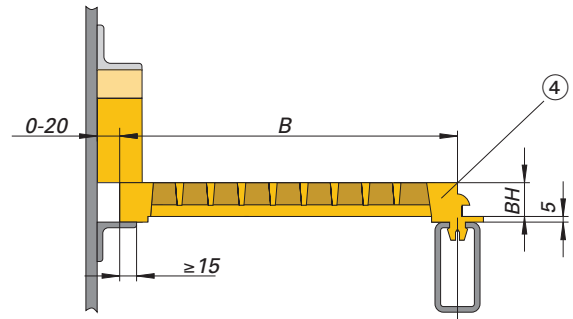


What is significant about the standard outside modules is that the NOCKIN bar is already integrated. When using an outside module type J-A an separate NOCKIN bar is required.

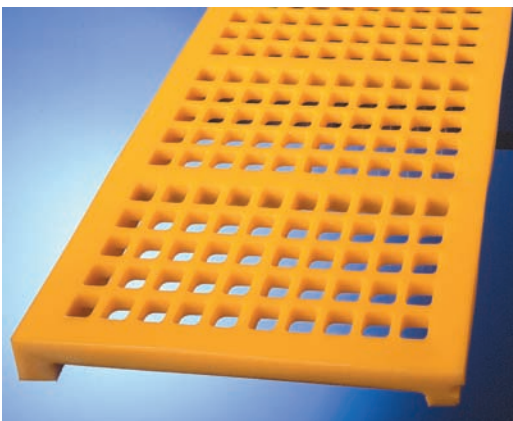
Screen module types



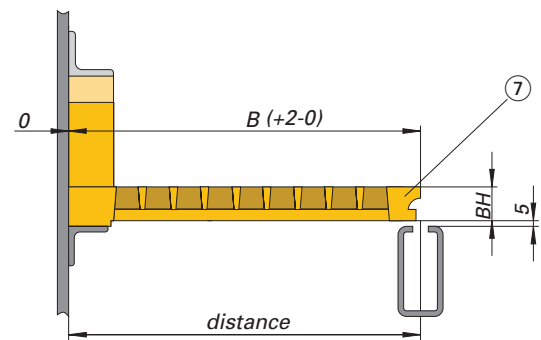
outside module type A



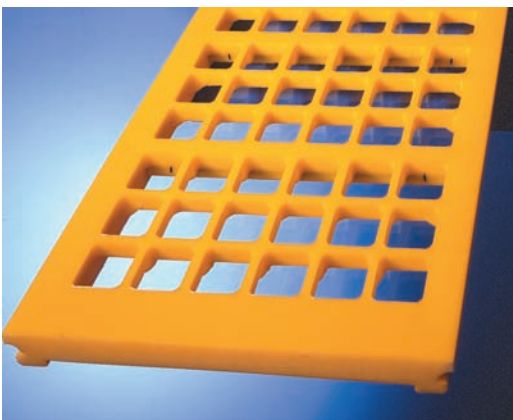
outside = side module, type A
Standard widths: 150, 175, 300, 325.
Other widths possible to accommodate
all machine widths



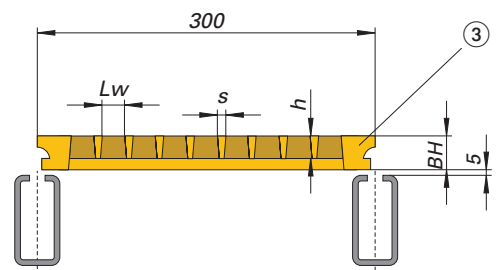
outside module type J-A



outside = side module, type J-A
When using this type of outside module
it is important that the width of the
module „B“ is correct (tolerance +2-0)



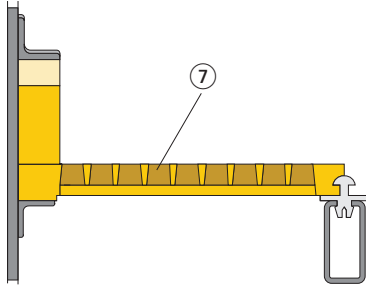
inside module



inside module = type J
Standard width 300

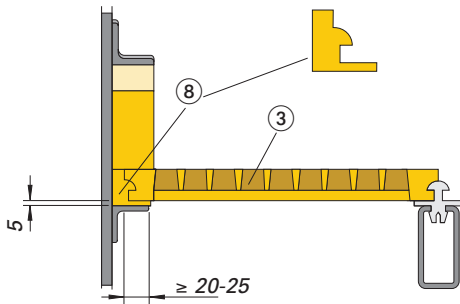
BH = thickness
Lw = hole width
B = width
h = aperture web depth
s = aperture rib width

Possible lateral bars / side fixings



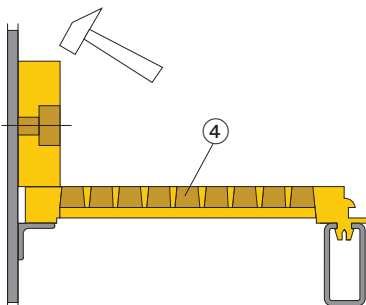
side fixing with
wedge bar and ⑦
J-A module

Wedge bars		
Width	Height	Length
40+50	75	1000
"	100	"
"	125	"
"	150	"
"	200	"



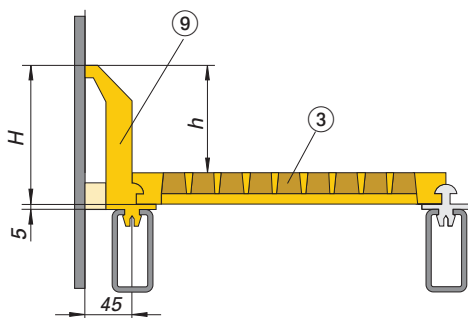
side fixing with
WS 85 fitting strip ⑧
for use only with **J modules**
fastened by a wedge bar

Wedges			
Width	h1	h2	Length
40	25	35	150
"	20	35	180
"	10	30	200
"	20	40	200



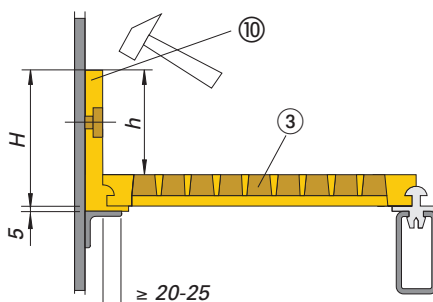
side fixing with **bolted side bar**
and the standard **A module**. ④
Position bolts,
adjust side bar with a hammer,
tighten bolts

Bolted side bar		
Width	Height	Length
20		
30		
40	variable	variable
50		
60		



side fixing with
WS 85 side protection bar ⑨
for use only with **J-modules** ③

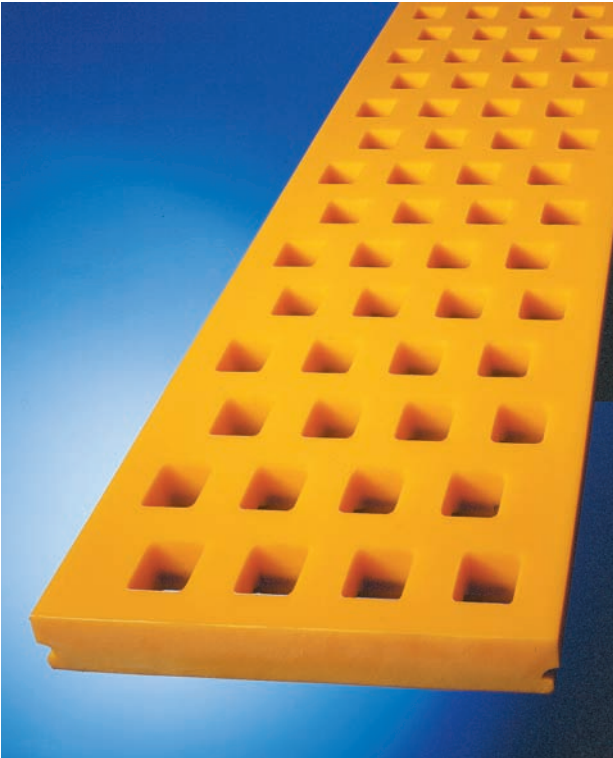
WS 85 side protection bars			
Width	H	h	Length
45	130	100	1000
"	180	150	"
"	230	200	"
"	340	300	"



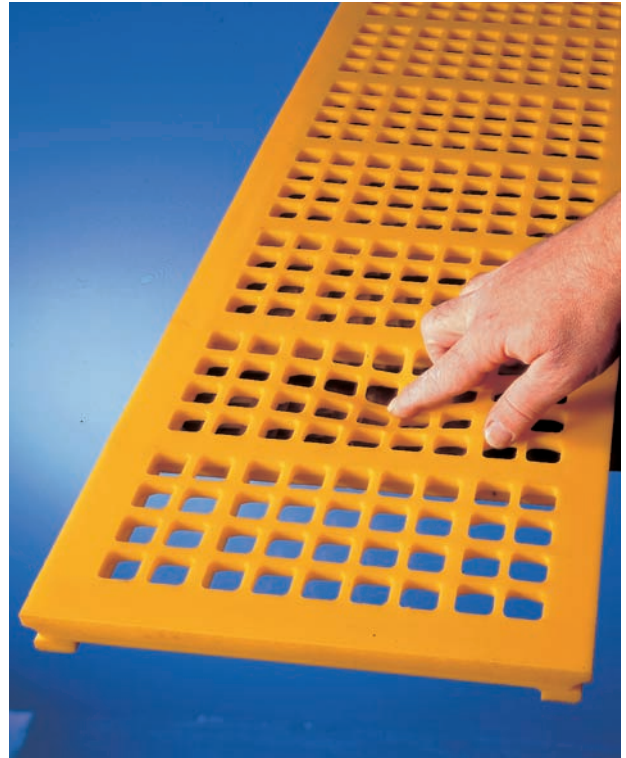
side fixing with
WS 85 side bar, ⑩
bolted, only for use
with **J modules** ③

WS 85 side bar			
Width	H	h	Length
≥ 20	130	100	1000
"	180	150	"

WS 85 screen module types



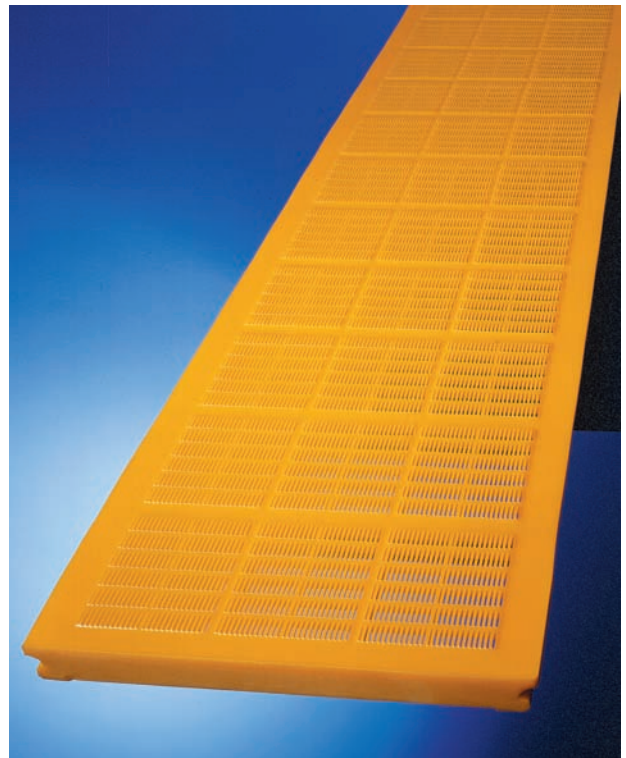
VG = Full cast
Screen modules with one hardness
all the way through



VG-flex = Full cast flex
Screen modules with flexible
aperture ribs and hard base



VG-Kb = Full cast combination screen
modules with soft wear layer
and hard base



SpG = Full cast, slot aperture for
product separation
Screen modules with one hardness
all the way through or also in
„flex“-version



*SpG = Full cast, slot aperture for dewatering
Screen modules for dewatering with
one hardness all the way through*



*VG = Full cast with strain relief ribs for
heavy duty applications*



*VG = Full cast special openings
e.g. elliptical shape 200 x 380*

WS 85 Screen module types



SG-H = Cast segment
Screen modules for dewatering
with PU thermoplastic segments
for material bed up to 250 mm



SG-HH = Cast segment
Screen modules for dewatering
with PU thermoplastic segments for
material bed up to 300 mm



SG = Cast segment with strain-relief ribs
Screen modules for dewatering
materials containing large particles



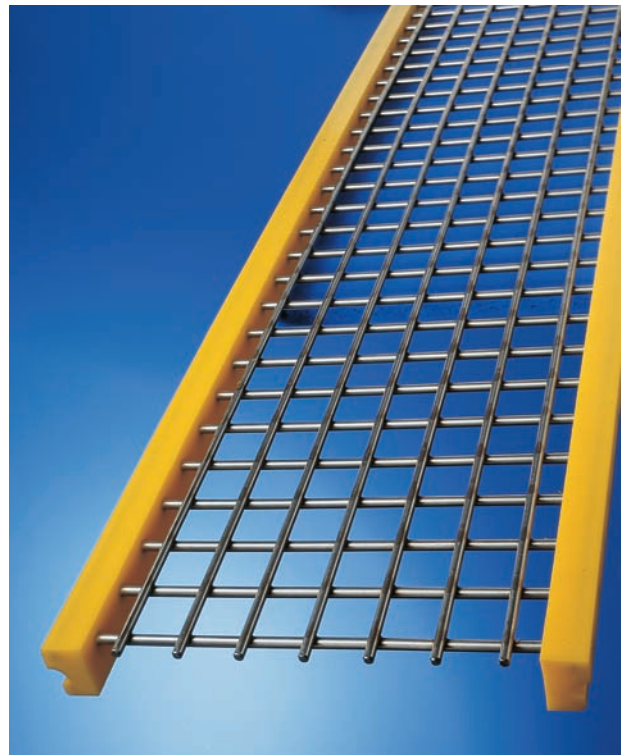
SPM = *Tensioned screen*
Screen module with thin PU membrane, pretensioned for screening difficult materials



SPM-flex = *Flexible tensioned screen modules as on the left designed with even greater flexibility*



Gu = *Rubber screen*

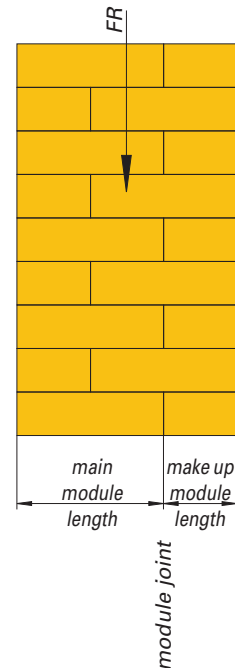
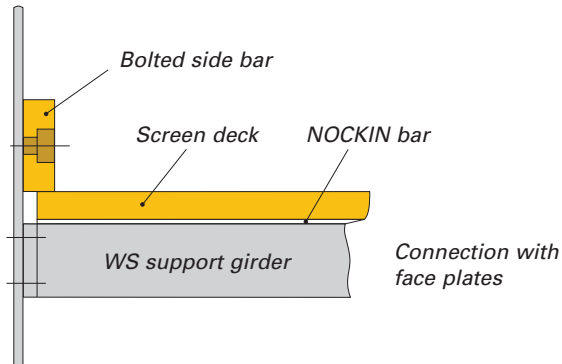


Metal screens with WS 85 profiles

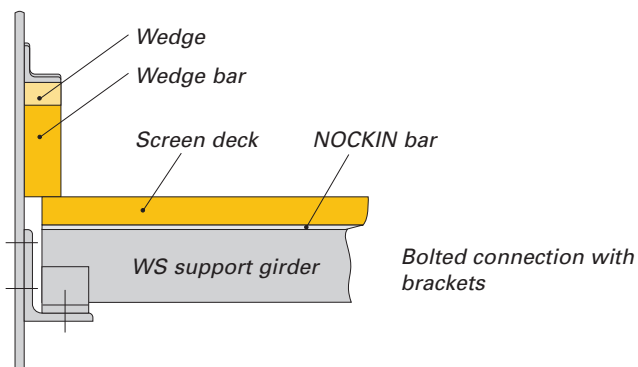
WS 85 lateral installation

... preferred by some clients – here some examples

Side protection with bolted side bar

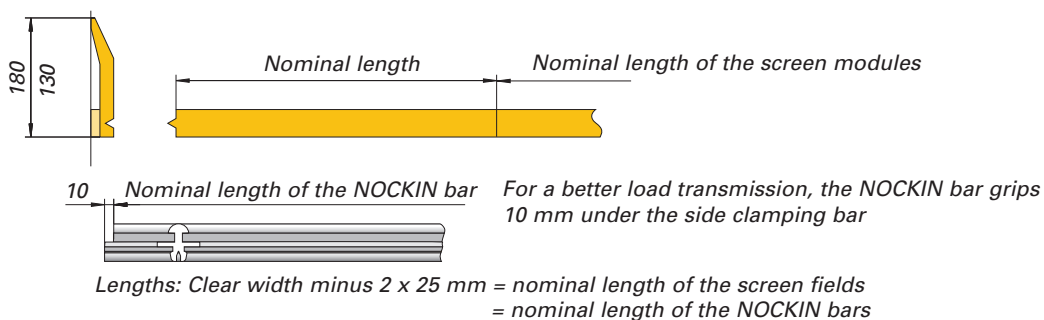
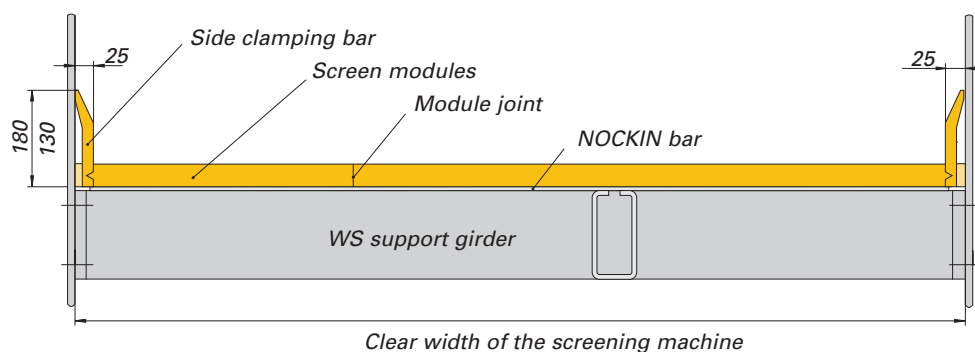


Side protection with wedged side bar



Side protection with lateral moulded side bar

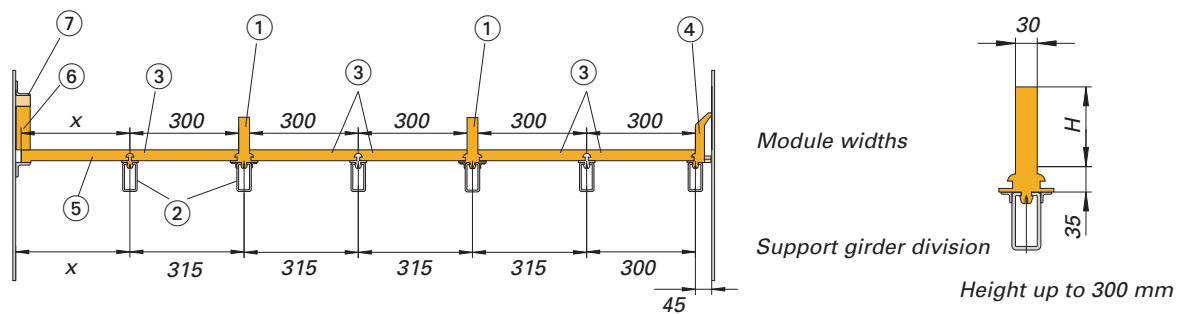
... a very straightforward and economic option without any wedges or screws



Separating bars

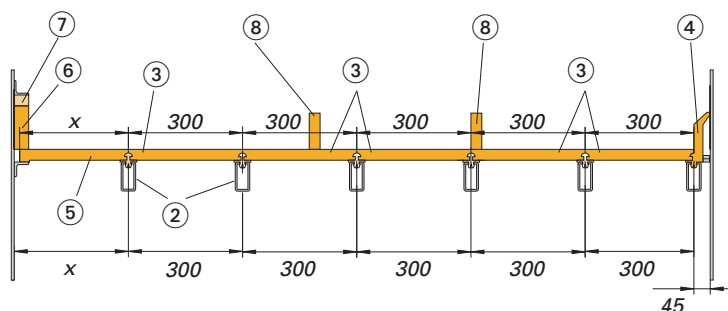
By using separating bars different screening sizes can be obtained on one screening deck.

... as WS 85 separating bar



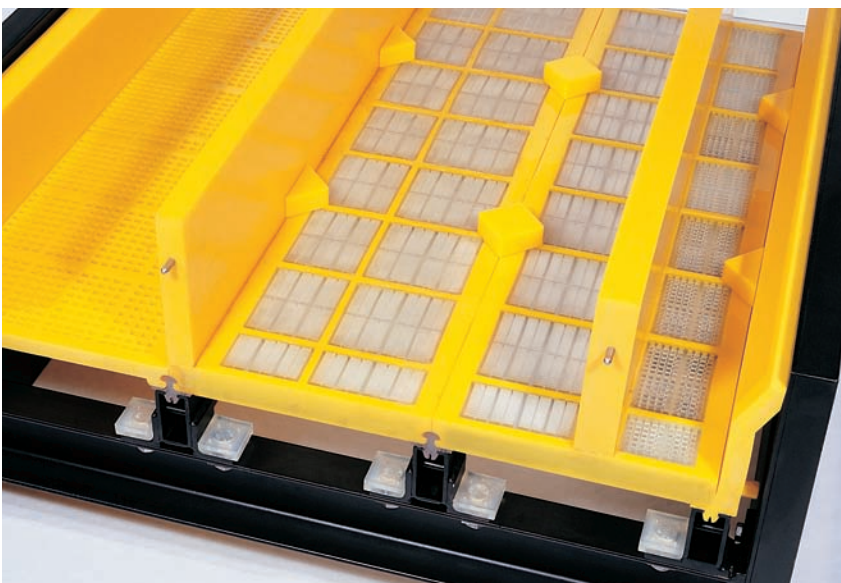
If WS 85 separating bars are used a different support girder division is required - see sketch.

... adhered version



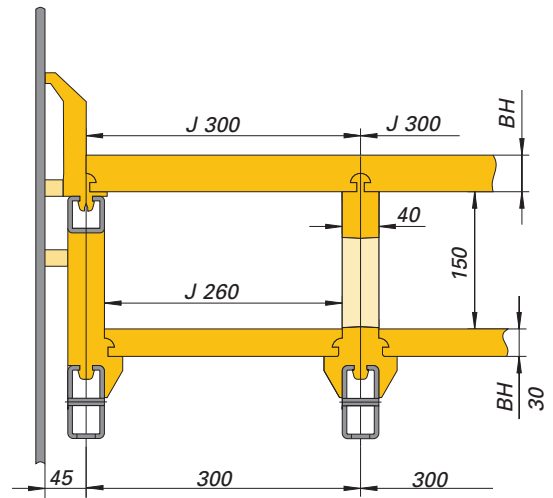
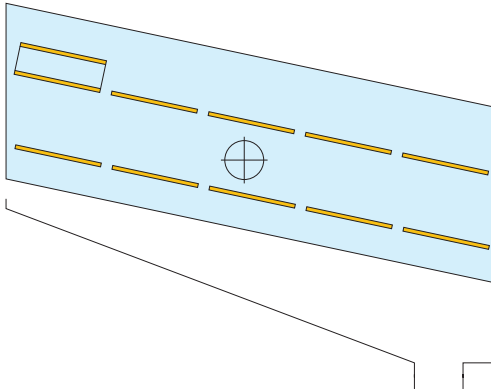
- ① WS 85 separating bar , height up to 300 mm
- ② WS 85 support girder
- ③ WS 85 type J module
- ④ WS 85 side bar
- ⑤ WS 85 type A module
- ⑥ Side bar
- ⑦ Wedge
- ⑧ Separating bar height to 200 mm

When using separating bars, bonded on to the edge or slightly off centre the screen modules, the support girder division remains at 300 mm.

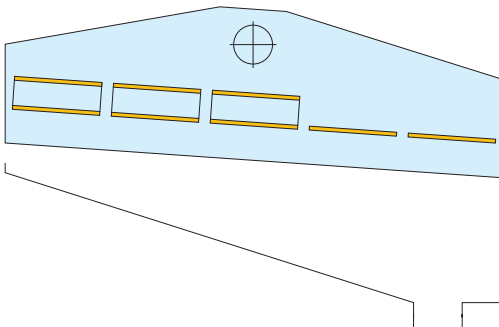


WS 85 in TANDEM design

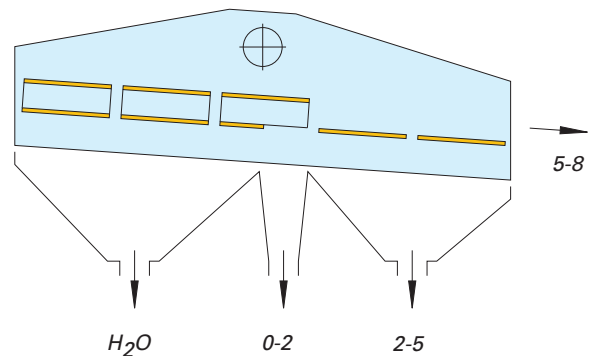
... as protective deck
to increase the service life of the separation deck



... as a relief deck
to increase the throughput



... as a separation deck
to obtain four products in one go

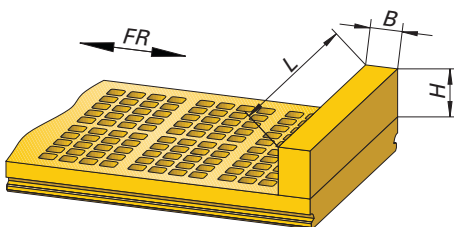


Example: Four in one go in a sized aggregate separation with a material feed of 0-8

Retarders

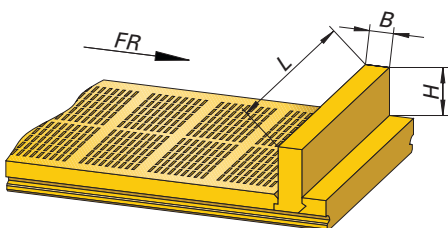


Retarder in use during sand dewatering



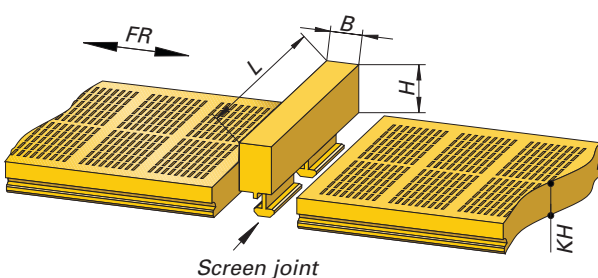
Retarder, bonded
... can be used for all PU screen panels

Width	Height	Length
30	20	variable
"	40	
40	20	
"	40	
"	60	



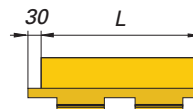
WS retarder
... from thickness 40 are not suitable for use with slot casting

Width	Height	Length
30	0	≤ 300
"	20	"
"	40	"
"	60	"

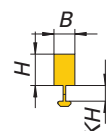
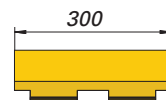


Clamping retarder
... can be used for slot cast and segment cast with thickness 30+40

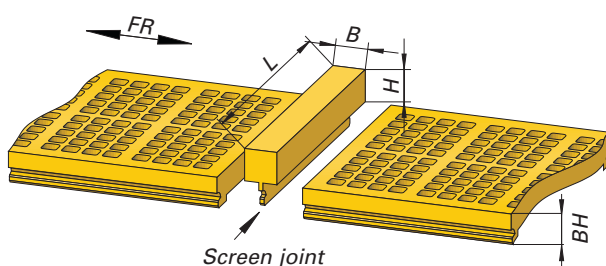
for outside modules



for inside modules

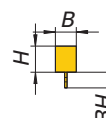
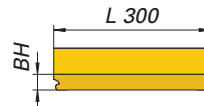


KH	B	H	Length	
			for J-	for A-
30	40	20	300	150, 175, 300, 325
"	"	40	"	
"	"	60	"	
40	"	20	"	
"	"	40	"	
"	"	60	"	



NOCKIN retarder

for inside modules

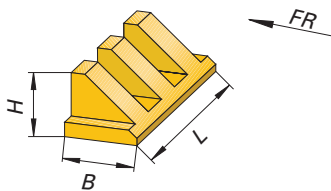


BH	B	H	L
30	40	20	300
30	"	40	"
40	"	20	"
40	"	40	"

Castellated retarders

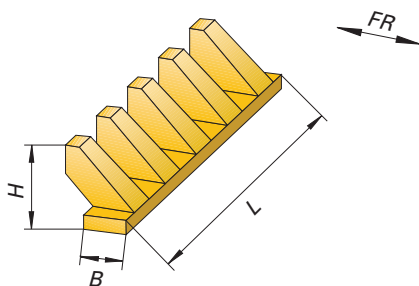


Castellated retarders used during sized aggregate separation



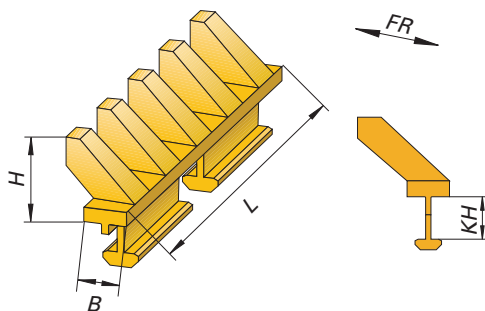
Castellated retarder, bonded,
normal design for dewatering

B	H	L
100	80	300
50	50	300



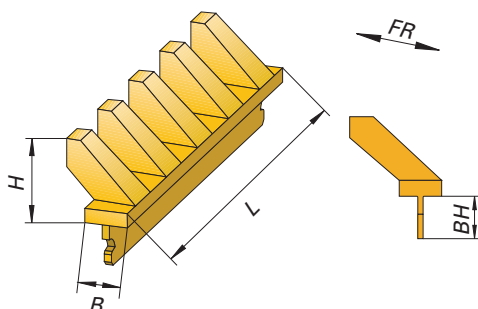
Castellated retarder, bonded,
bevelled design

B	H	L
50	80	300
30	50	300



Clamping retarder

B	H	L	KH
40	50	300	30
40	50	300	40

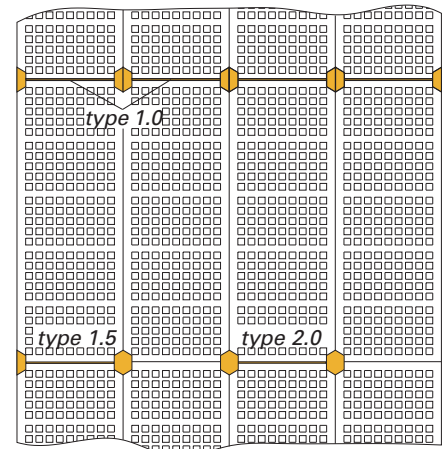
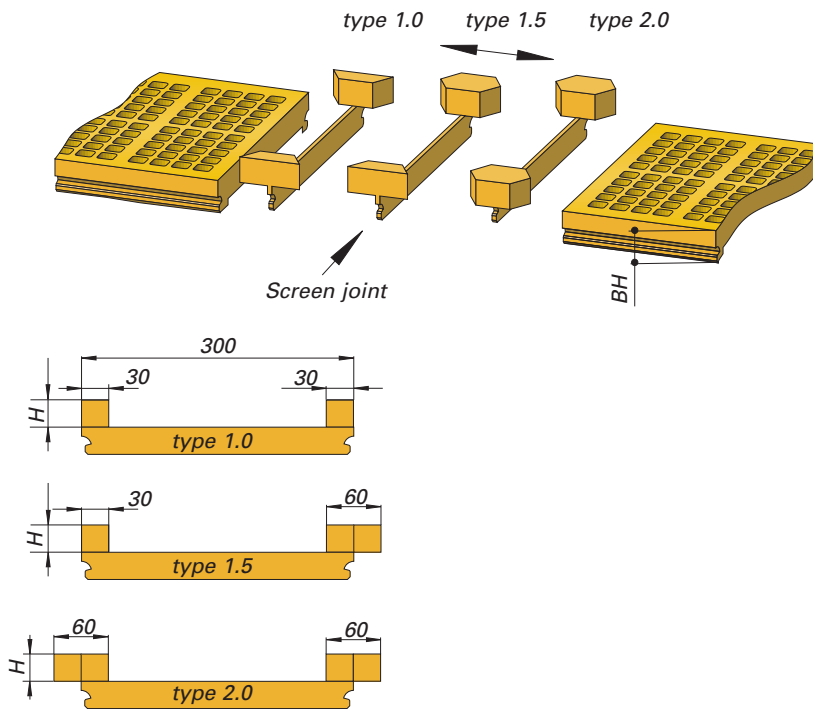


NOCKIN castellated
retarder

B	H	L	BH
40	50	300	30

Deflectors

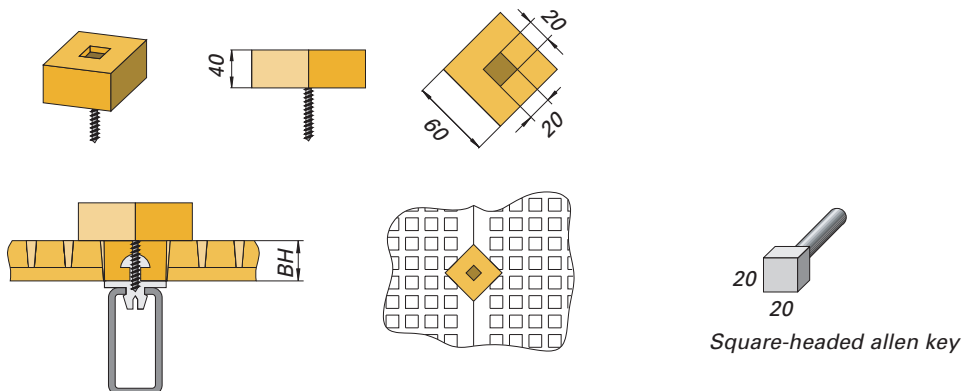
NOCKIN deflector with drip apron



BH	B	H	L
30	30/60	25/40	300
40	"	"	"

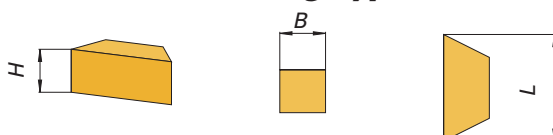
These deflectors are selected according to deck thickness and type and are simply assembled in screen module joints.

Spike deflector, can be screwed in



These deflectors are assembled between the longitudinal screen module joints. Fitting is very easy if a square-headed allen key (20x20) and a battery-powered screwdriver are used.

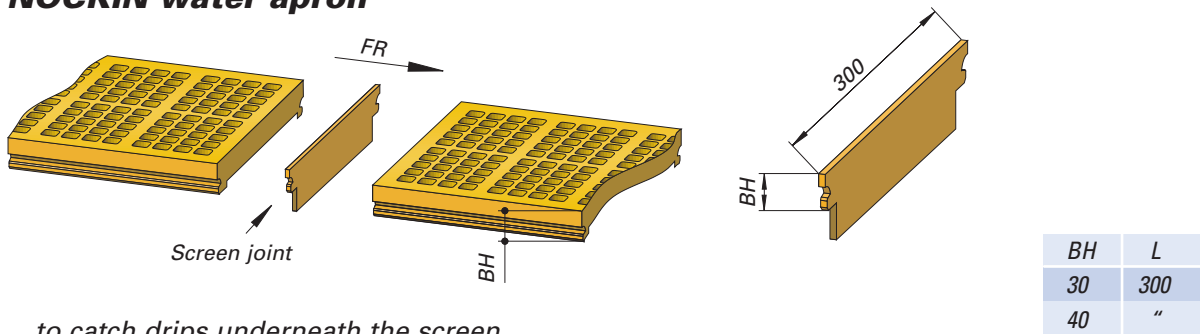
Deflector, bonding type



B	H	L
30	25	60
35	30	70
"	40	"
40	40	80
"	50	"

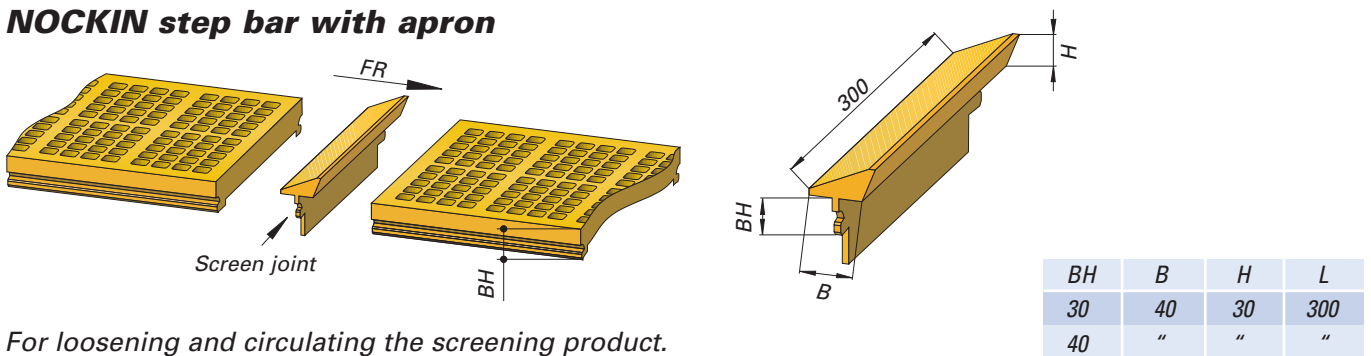
Using a dual component PU adhesive a totally safe bond is attained.

NOCKIN water apron



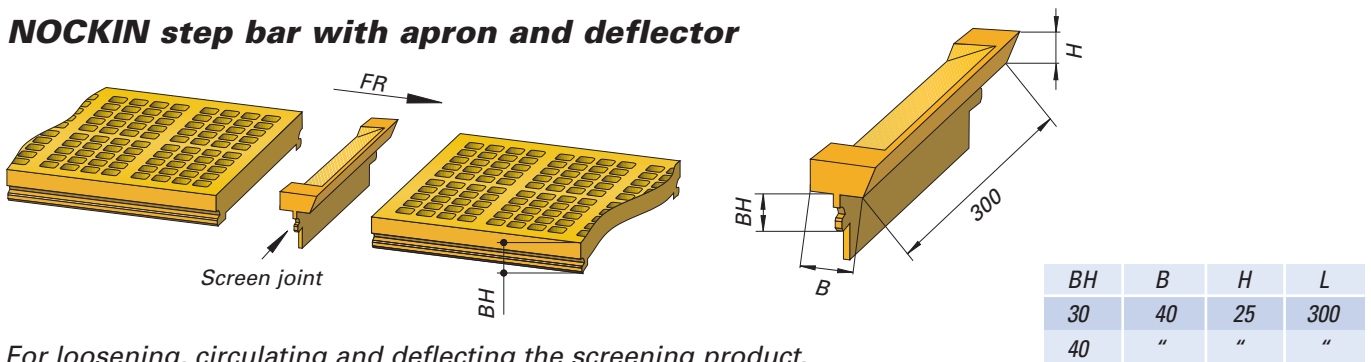
... to catch drips underneath the screen.
Easy to assemble in the screen module joints.

NOCKIN step bar with apron



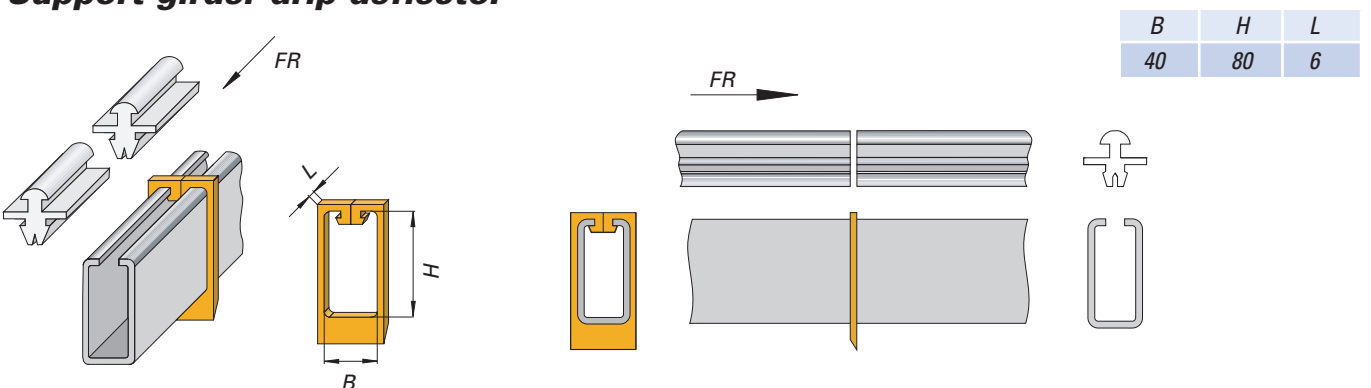
For loosening and circulating the screening product.
Easy assembly in screen module joints.

NOCKIN step bar with apron and deflector



For loosening, circulating and deflecting the screening product.
Easy to assemble between the screen module joints.

Support girder drip deflector

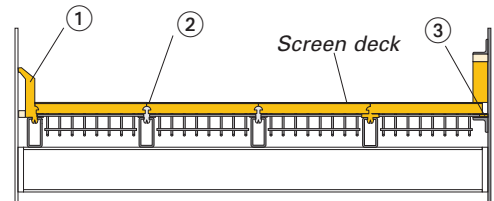
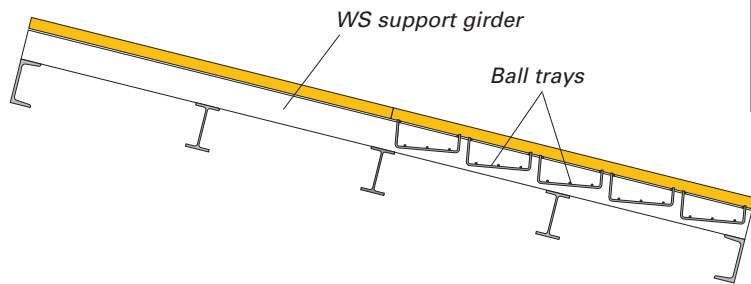


To catch drips from the WS 85 support girders. Easy to assemble in the NOCKIN bar joints.

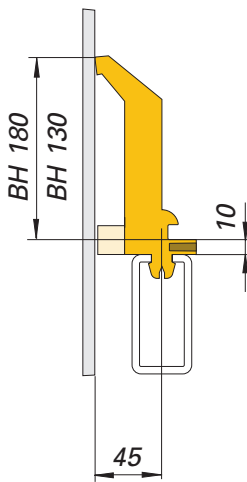
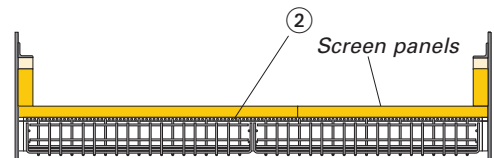
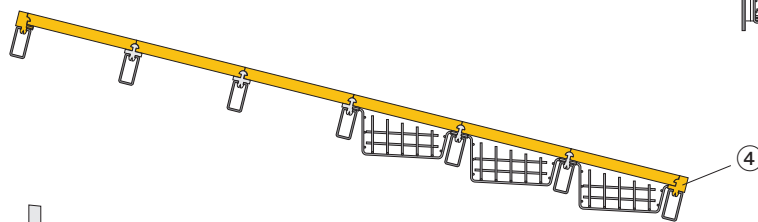
Knocking facility

Wet mineral material has a tendency to cake and blind.
A knocking facility can help solve this problem.

... for longitudinal installation

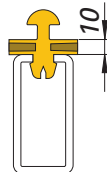


... for transverse installation



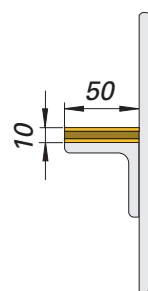
①

WS 85 side bar
for ball trays



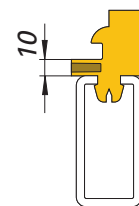
②

WS 85 NOCKIN bar
for ball trays



③

Outside bar
for ball trays



④

WS 85 end bar
for ball trays

Knocking balls



Ø 50



Ø 55



Ø 60

Knocking facility

... used during dry screening, mainly up to a separation size of 8 mm.



Assembly of the ball trays:

First the ball trays are assembled in a NOCKIN bar on the WS support girder.

Then on the other side of the ball trays a second NOCKIN bar is assembled on the trays which then is assembled together with the trays on the next WS support girder.

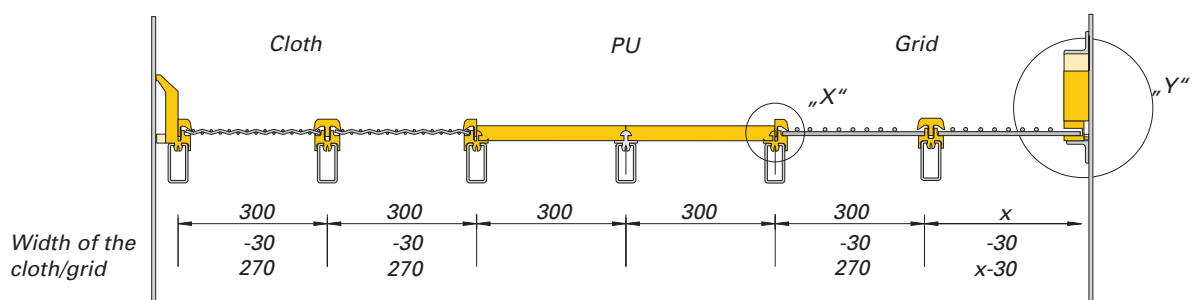


*Knocking facility in connection with tension modules used in dry screening of sized aggregates.
Separation at 5 mm.*

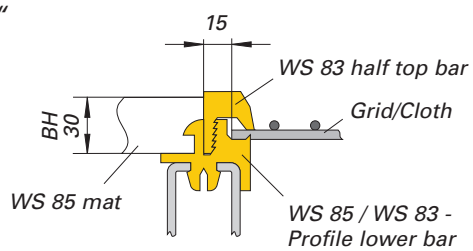
WS 83 wire cloth and wire grid in connection with WS 85

Using wire cloths in connection with plastic or rubber screens can be advisable, for example:

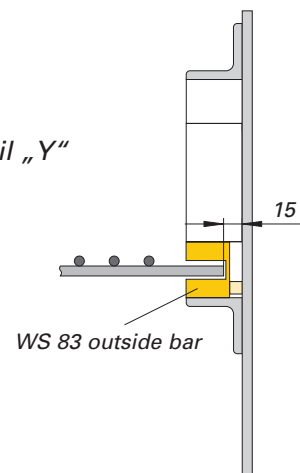
- when the screen deck is overloaded
- when there are short-term changes to a different separation size
- when the mineral screening products are wet from the ground



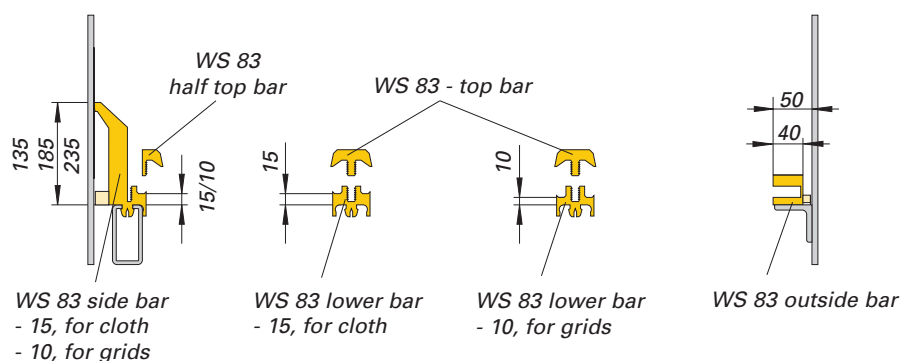
Detail „X“



Detail „Y“



WS 83 individual parts



WS 83

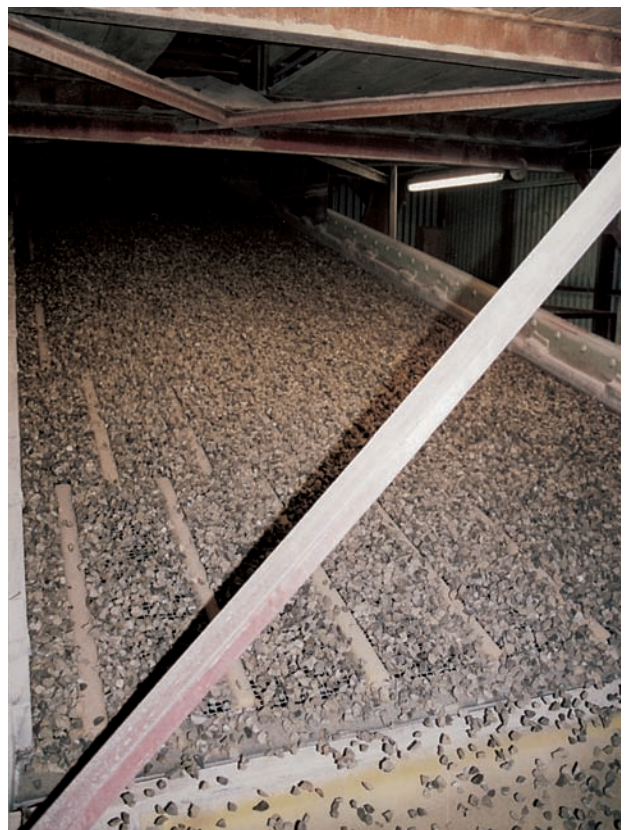
*Suitable for wet and dry screening
For wire cloth and grid*



Assembly sequence per metre:

*Tools: Hammer, ~ 2000 g
assembly paste or grease/oil
and paintbrush*

- *Lighty lubricate WS support girder and/or WS 83 lower bar*
- *Assemble the bar into the support girder – ensure that the end of the WS 83 bar fits flush with the end of the support girder*
- *Position the outside bar with the outside cloth*
- *Position the center cloth*
- *Assemble all top bars until they clamp easily*
- *Adjust the cloth again if necessary*
- *Assemble the wedge bars until they clamp easily*
- *Drive the top bars down into the bottom section using a hammer*
- *Fix wedge bars*



WS 83

By using different cloths and grids with various wire diameters different clamping heights are required.

As a result different clamping profiles are needed as follows:

WS 83 top bar: remains the same for all cloth and grids

WS 83 bottom bar: the measurement x is different.

$x = 15$, for wire diameters up to approx. 12 mm

$x = 10$, for wire diameters from approx. 12 mm upwards

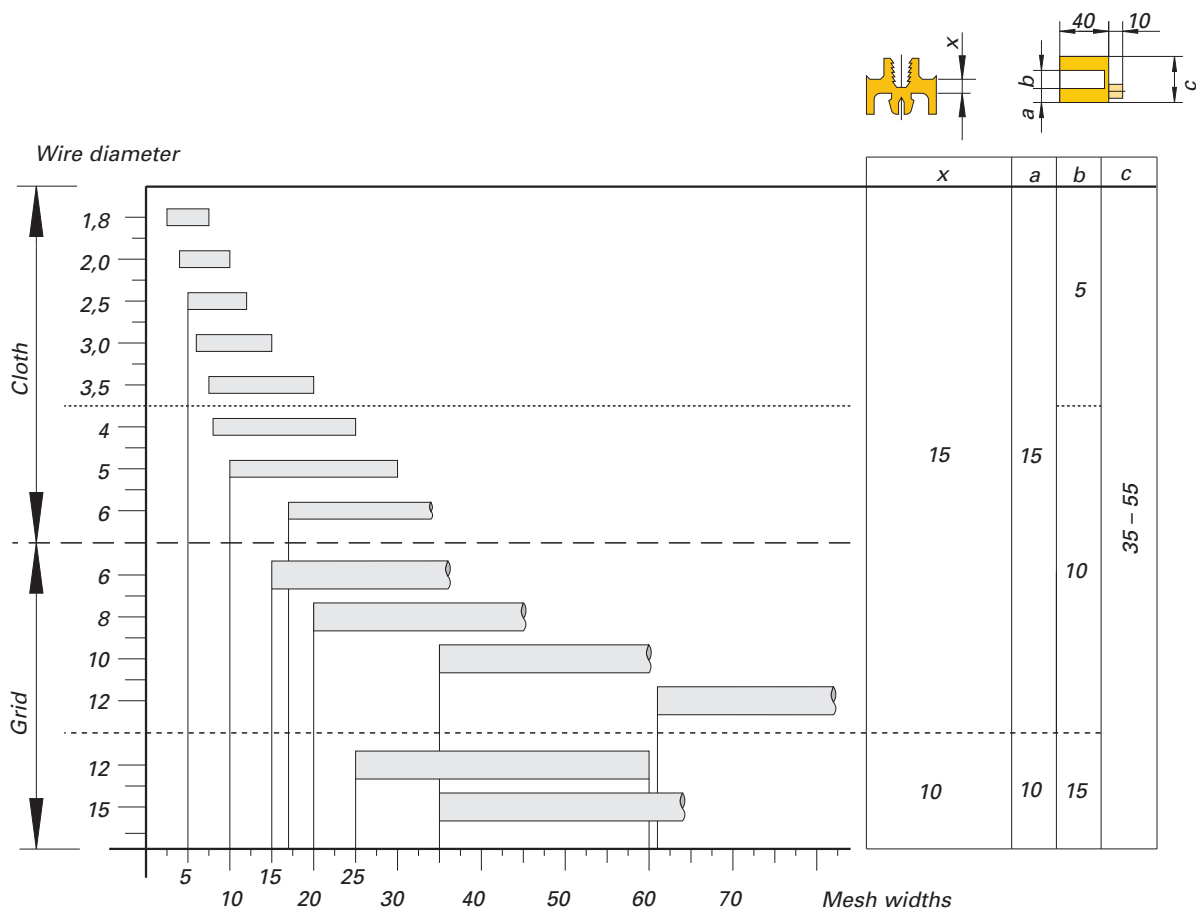
The precise cap whether $x = 15$ or $x = 10$ also depends on the mesh size and can be taken from the following table.

WS 83 side bar: the dimensions $a + b$ will differ depending on the thickness of the wire and the type of screen cloth

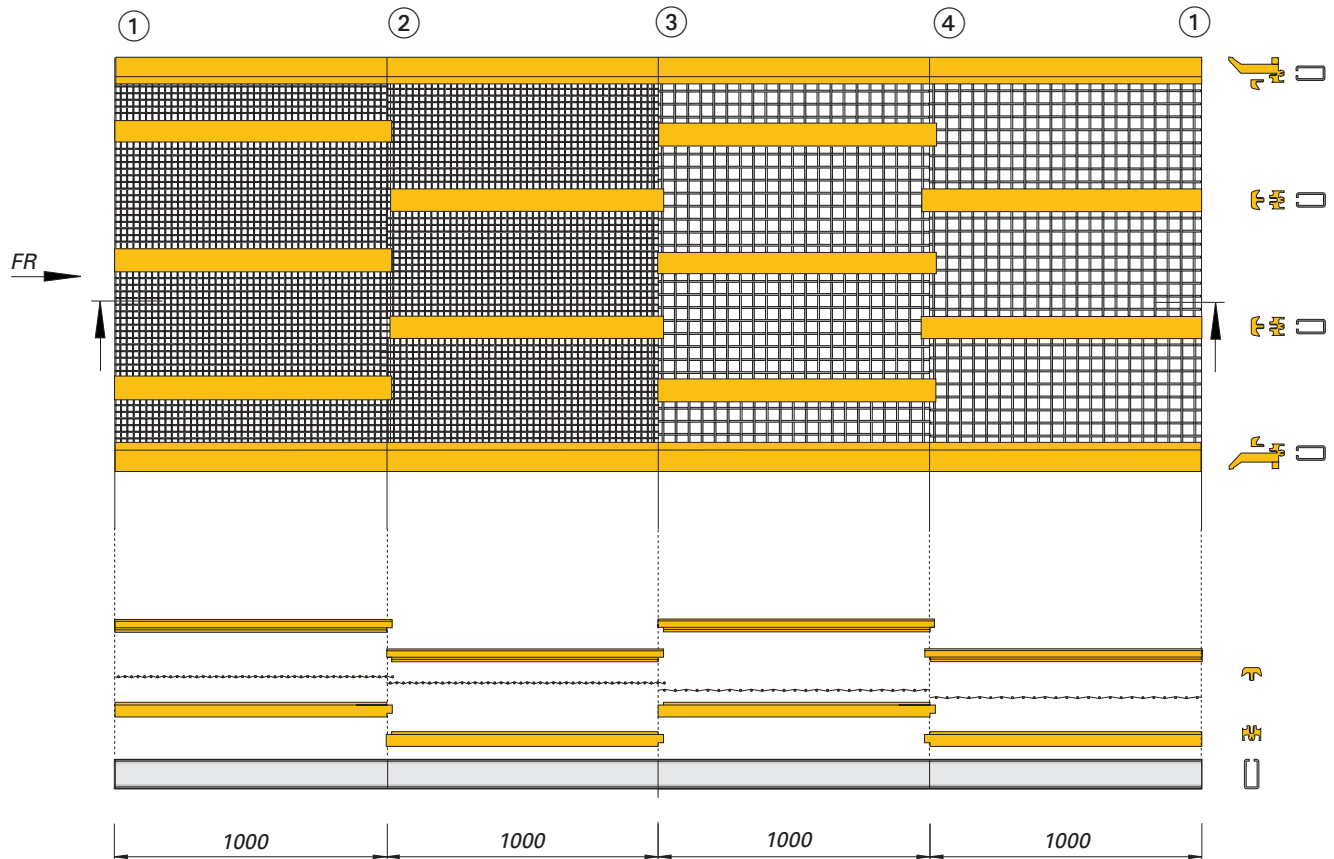
Please refer to the following table for details.

Which bottom bars and which side bars belong to which cloths/grids?

The top bar is independent and always remains the same as stated above.



WS 83 – for support girder layout with offset



When using cloth with wire thicknesses of up to 2.2 mm we recommend overlapping the cloth by about 15 mm to avoid gaps where the screen modules meet (join (2) + (3)).

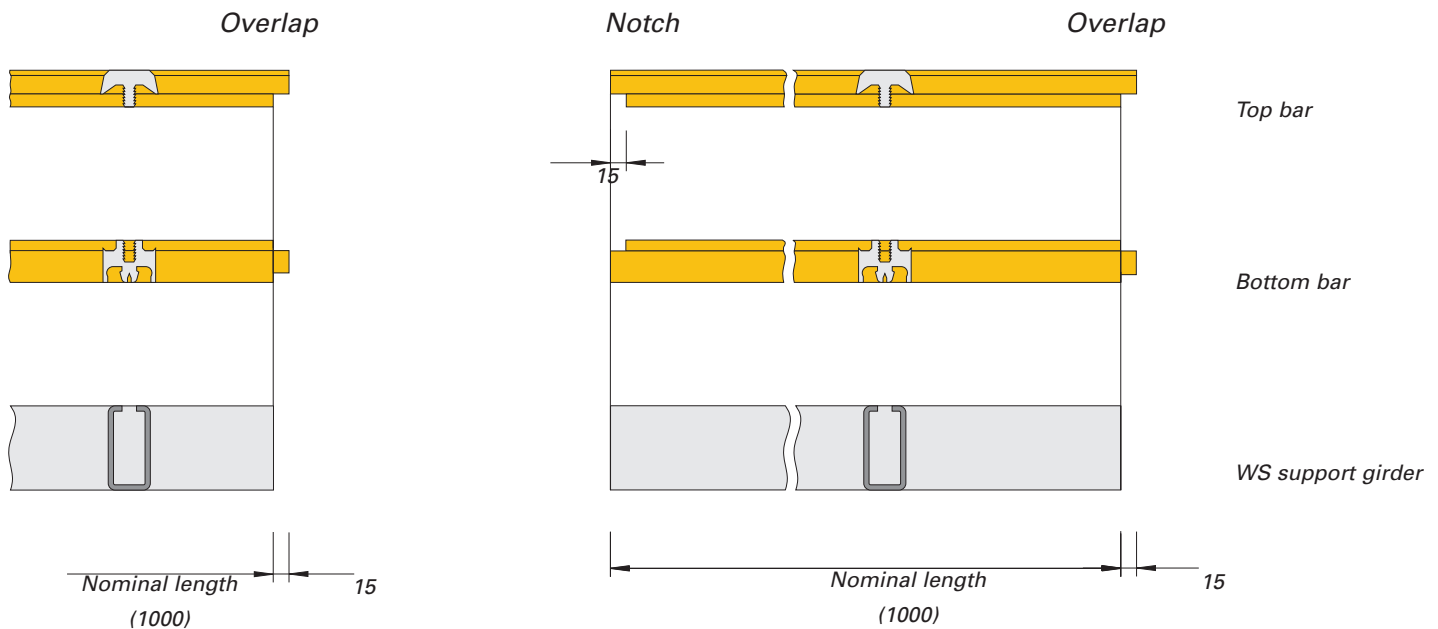
The adjoining profile bars have an overlap on the discharge side and a notch on the feed side to support the cloth ends at the join.

For cloth with wire thicknesses of 2.5 mm to 3.0 mm we recommend using WS 83 top and bottom bars with overlaps so that the opposite cloths are supported at the join in order to avoid any gaps (join (4)).

For cloth and grids with wire thicknesses greater than 3.0 mm no overlapping and notches are required. The cloths, grids start and end with the respective profile bars.

- | | |
|----------------|---|
| Screen start ① | the cloths/grids and profile bars start at the same height |
| Screen join ② | shows a cloth overlapping with wire thicknesses of up to 2.2 mm
Profile bar end with 15 mm overlap
Profile bar start with 15 mm notch |
| Screen join ③ | shows a cloth overlap to a stronger cloth (e.g. wire diameter 3.0 mm)
Profile bar end with 15 mm overlap
Profile bar start with 15 mm notch |
| Screen join ④ | shows a cloth join (e.g. wire diameter 3.0 mm)
Profile bar end with 15 mm overlap
Profile bar start with 15 mm notch |
| Screen end ① | the cloths/grids and profile bars end at the same height |

WS 83 profile bars with overlap and/or notch



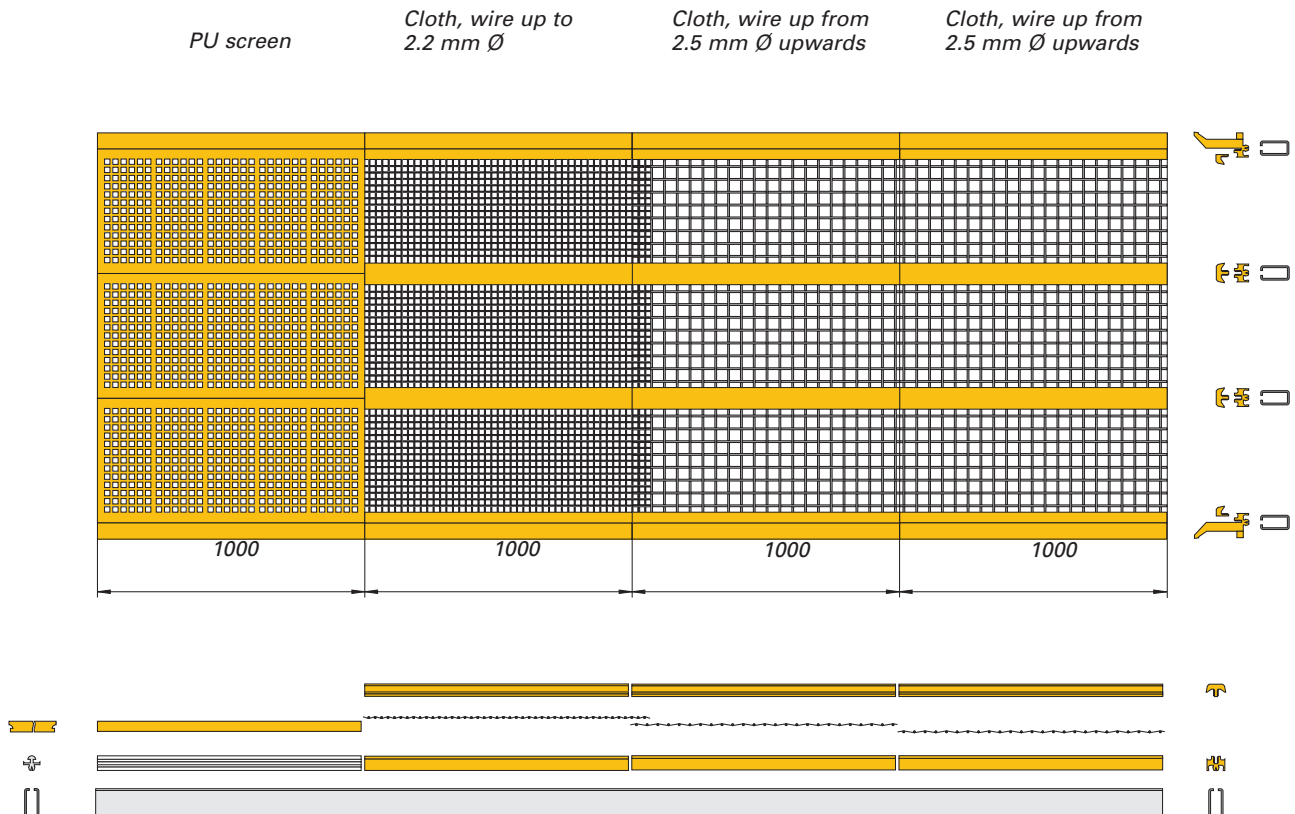
Please note: The overlap is outside the nominal length of the profile bar and the notch within the nominal length of the profile bar.

Wire Ø	Length of the cloths	Length of the profile bars	
1,8	Nominal length + Overlap	Nominal length + Notch + Overlap	Cloth
2,0	Nominal length + Overlap	Nominal length + Notch + Overlap	
2,2	Nominal length + Overlap	Nominal length + Notch + Overlap	
2,5	Nominal length	Nominal length + Notch + Overlap	
3,0	Nominal length	Nominal length + Notch + Overlap	
3,5	Nominal length	Nominal length + Notch + Overlap	
4,0	Nominal length	Nominal length	
5,0	Nominal length	Nominal length	Grid
6,0	Nominal length	Nominal length	
6,0	Nominal length	Nominal length	
8,0	Nominal length	Nominal length	
10	Nominal length	Nominal length	
12	Nominal length	Nominal length	
15	Nominal length	Nominal length	

WS 83 with support girder layout without offset

For cloths with a wire thickness of up to 2.2 mm, we recommend a cloth overlap of approx. 15 mm in order to avoid gaps where the cloths join.

WS 83 top bar and bottom bars do not have any notch and/or overlap.



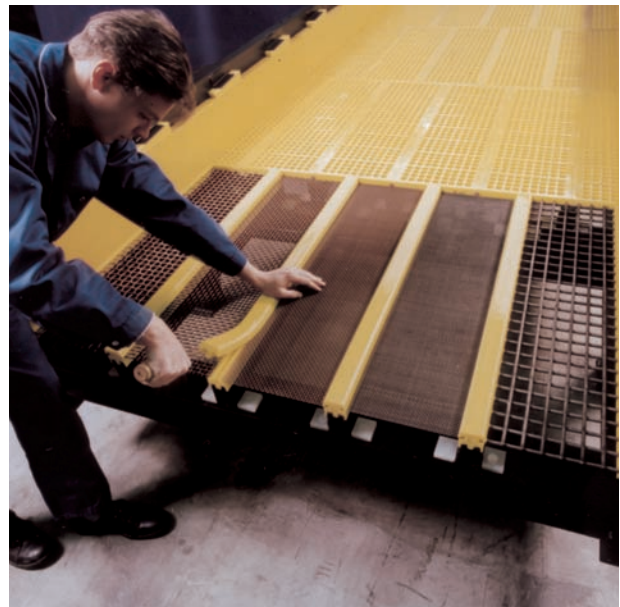
Dismantling:

Tools: Screwdriver, ~ 14 mm
Hammer, ~ 2000 g

- At the end of the bar reach with the screwdriver under the top bar and lever out upwards. The top bar can then be removed manually. Loosen the wedge bar and remove the cloth.

Removing the lower bar:

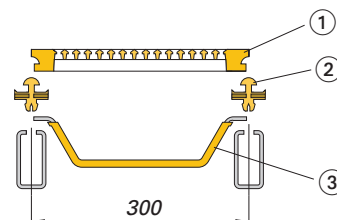
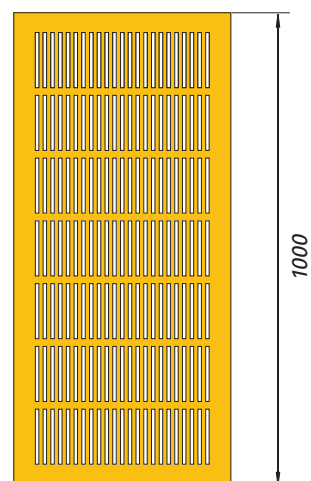
- At the end of the bar reach with the screw driver between the top edge of the WS support girder and the bottom bar and lever out. The bottom bar can be removed manually.



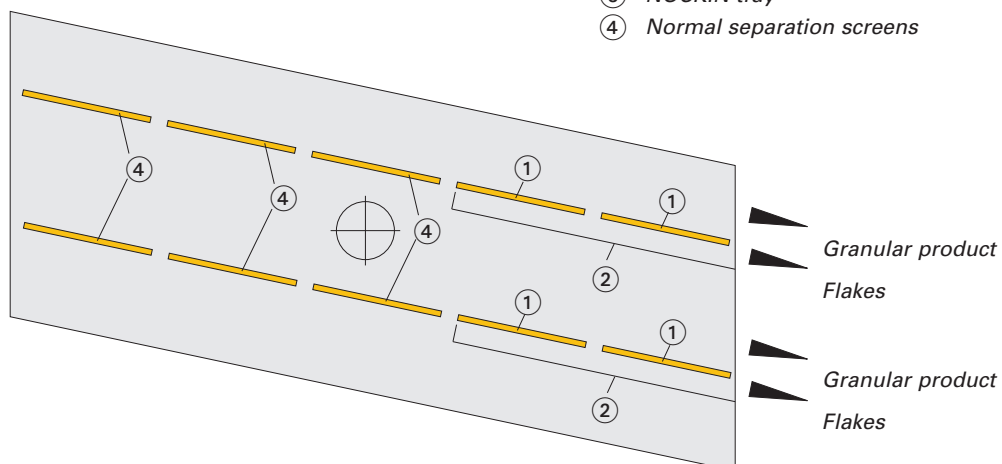
De-flaking screen

... to improve the quality of the granular fractions

The flaky material is collected directly under the de-flake screen in the NOCKIN tray, transported and then discharged separate from the good product for further processing.



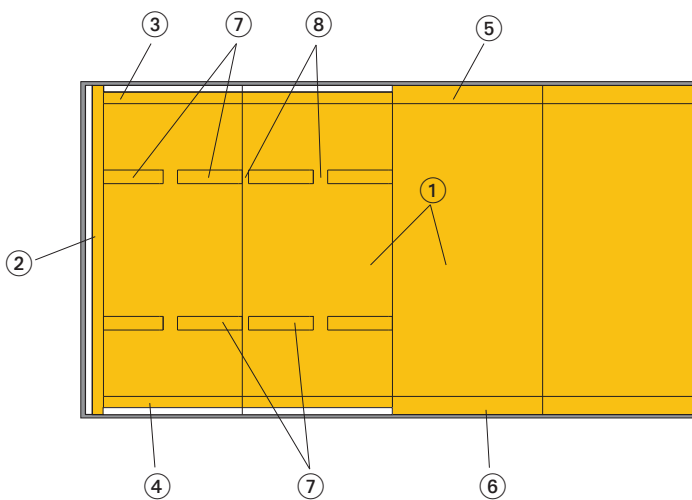
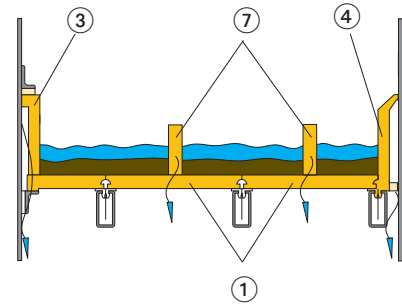
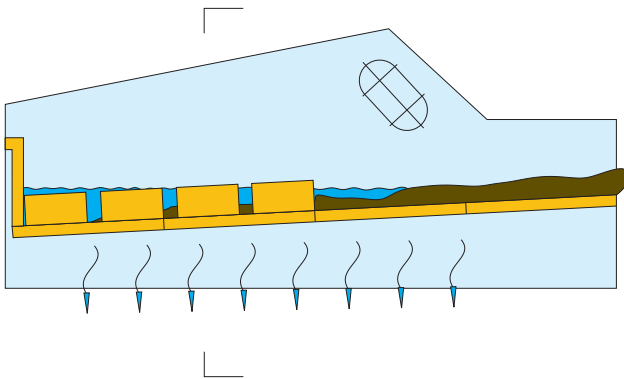
- ① De-flake screen
- ② NOCKIN bar for trays
- ③ NOCKIN tray
- ④ Normal separation screens



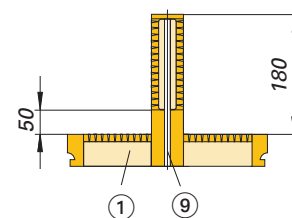
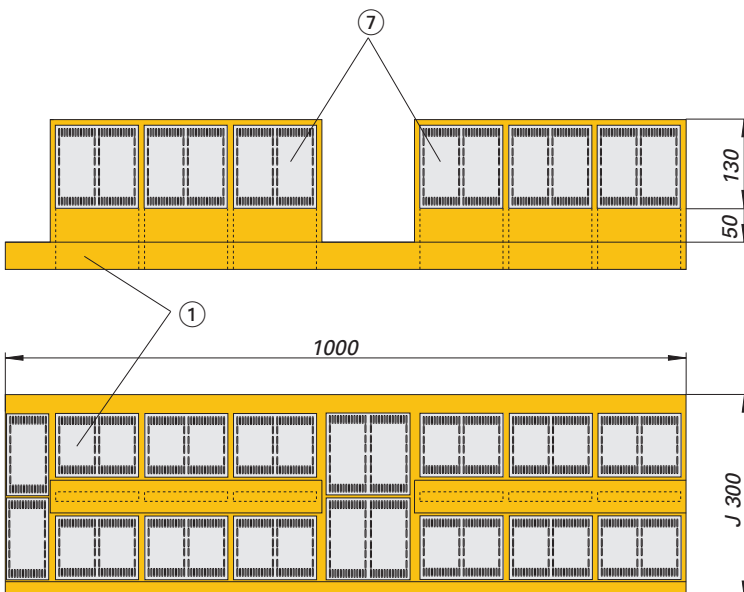
During de-flake screening the slot can run with or across the material flow.

Surface (water) dewatering

By using surface dewatering bars a faster removal of the water is obtained and thus a better dewatering of the solids.



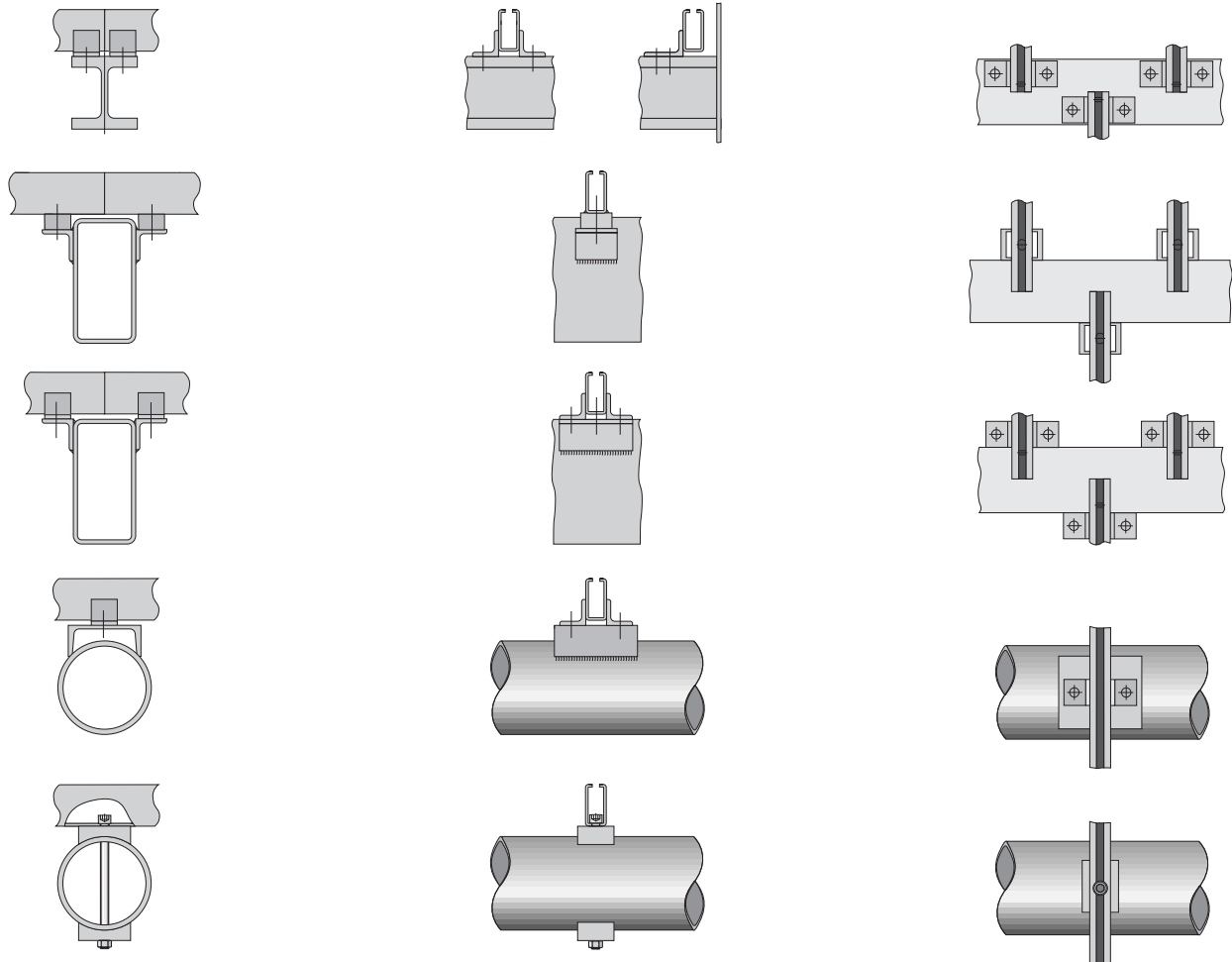
- ① WS 85 dewatering screen
- ② Dewatering back wall
- ③ Dewatering side bar
- ④ WS 85 dewatering side bar
- ⑤ Standard side bar
- ⑥ Standard WS 85 side bar
- ⑦ **Surface dewatering bar**
- ⑧ Interruption to material and water distribution
- ⑨ Dewatering canal



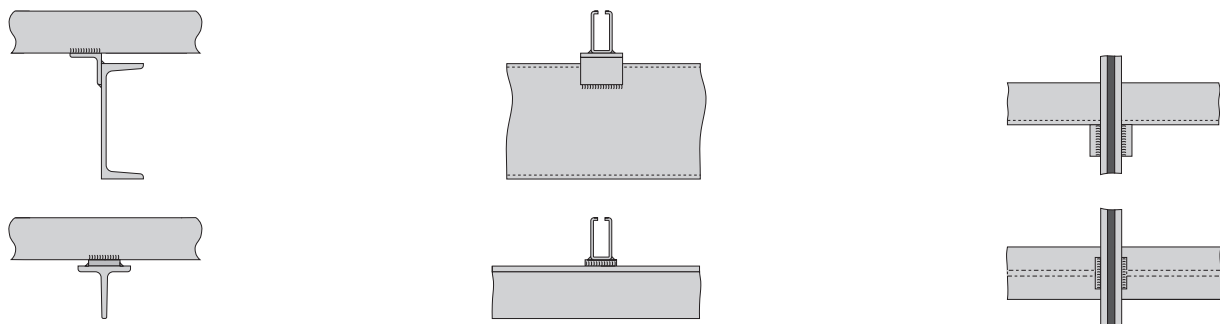
A WS 85 segment cast screen J 300 x 1000 with two surface dewatering bars has an open dewatering surface which is 60% larger.

WS 85, some examples of support girder connections

Bolting connections



Welded connections

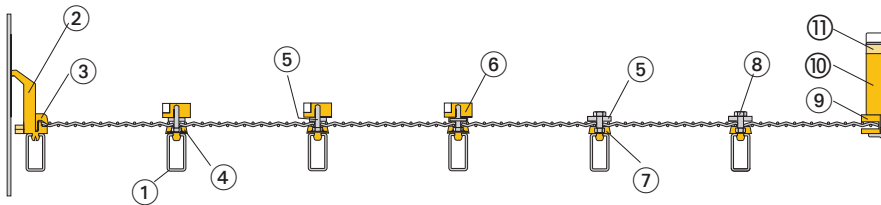


If welded connections cannot be avoided, care must be taken that the welding seams do not run across the profile but always only longitudinally.

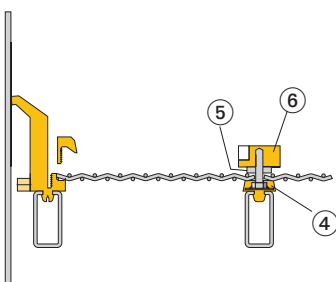
Wire Cloth fixing suggestions on WS 85 support girder profiles

... with continuous cloth

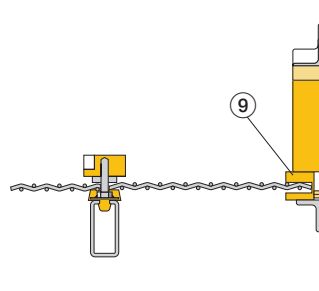
over the width of the screening machine



- ① WS 85 support girder
- ② WS 83 side bar
- ③ WS 83 1/2 top bar
- ④ WS 85 girder bar with stud bolt M12
- ⑤ Flat steel 40 x 8 x length
- ⑥ PU nuts M 12
- ⑦ WS 85 support girder with nut M 12
- ⑧ Bolt M12x30
- ⑨ WS 83 outside bar
- ⑩ Side bar
- ⑪ Wedge



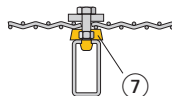
... Side fixing with
WS 83 side bar



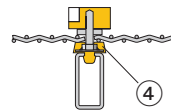
... Side fixing with
WS 83 outside bar



... Cloth with inte-
grated WS 85
girder profiles



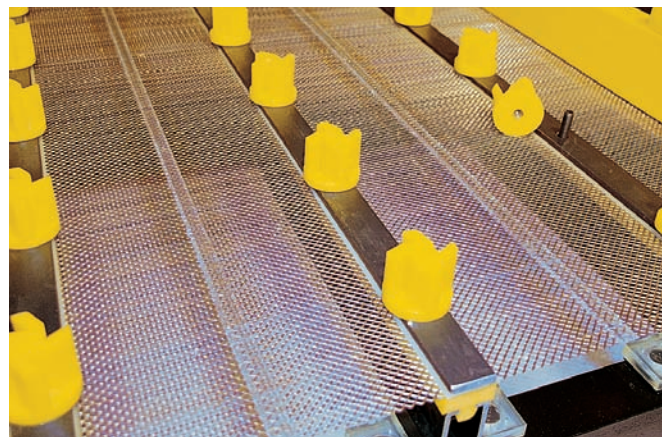
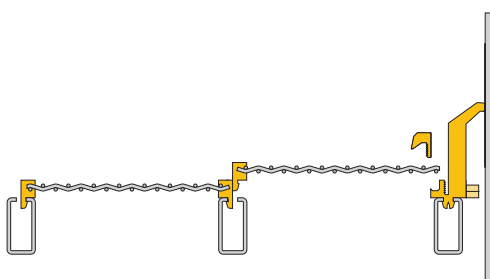
... WS 85 girder bar
with integrated
nuts (M12)

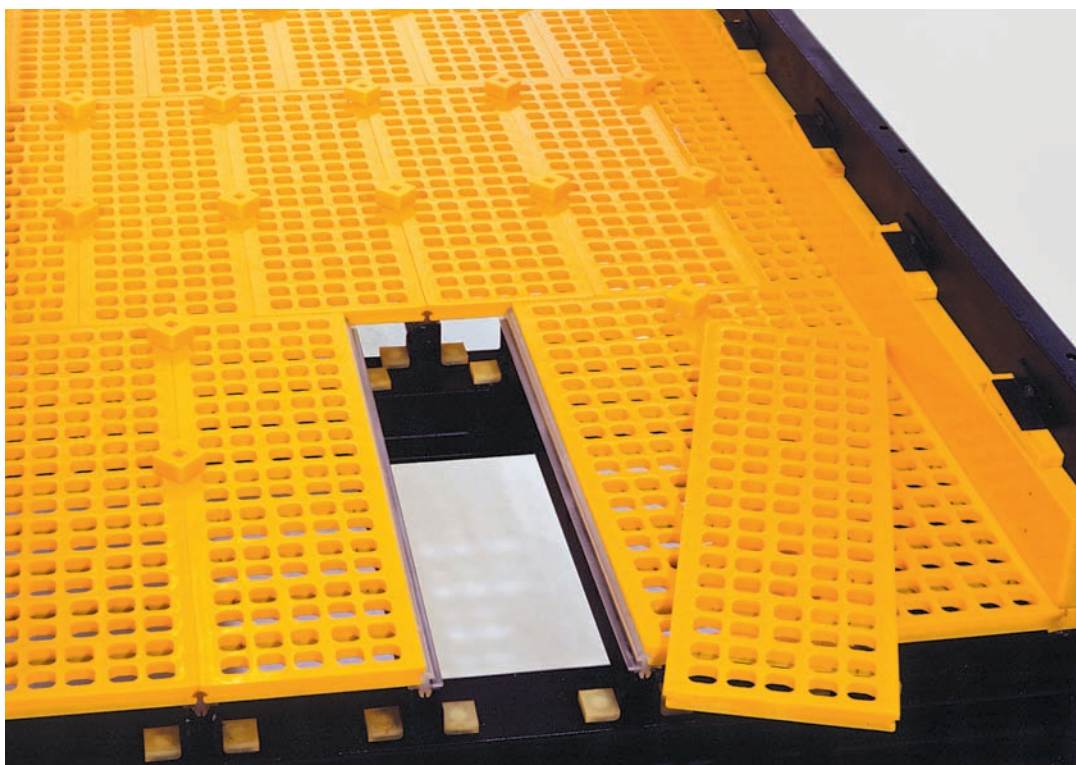


... WS 85 girder bar
with integrated stud
bolts (M12)

... with cloth segments

and integrated WS 80 profiles





*WS 85 ... easy to exchange,
special holes also available*



Elliptical holes



Circular holes



Pear drop holes



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