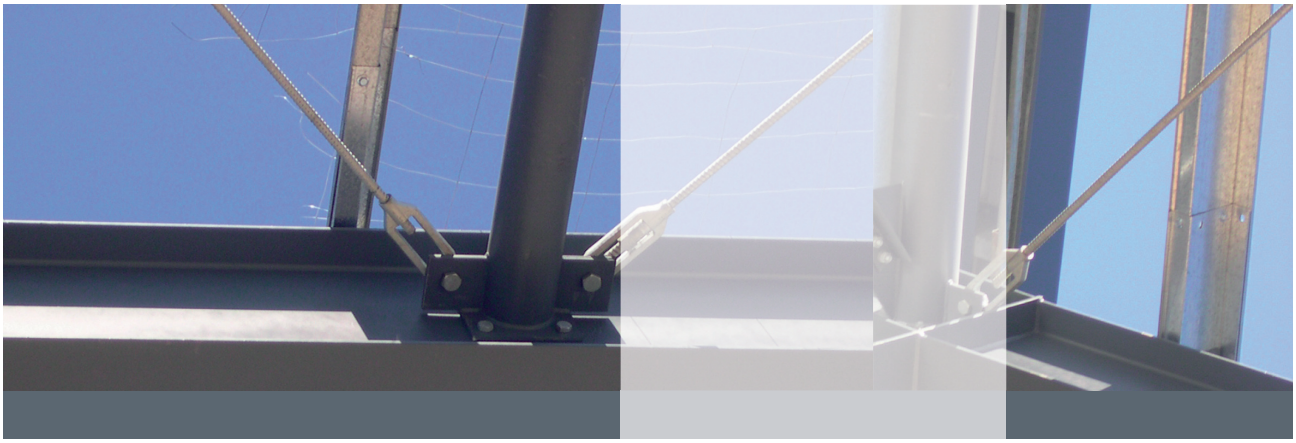
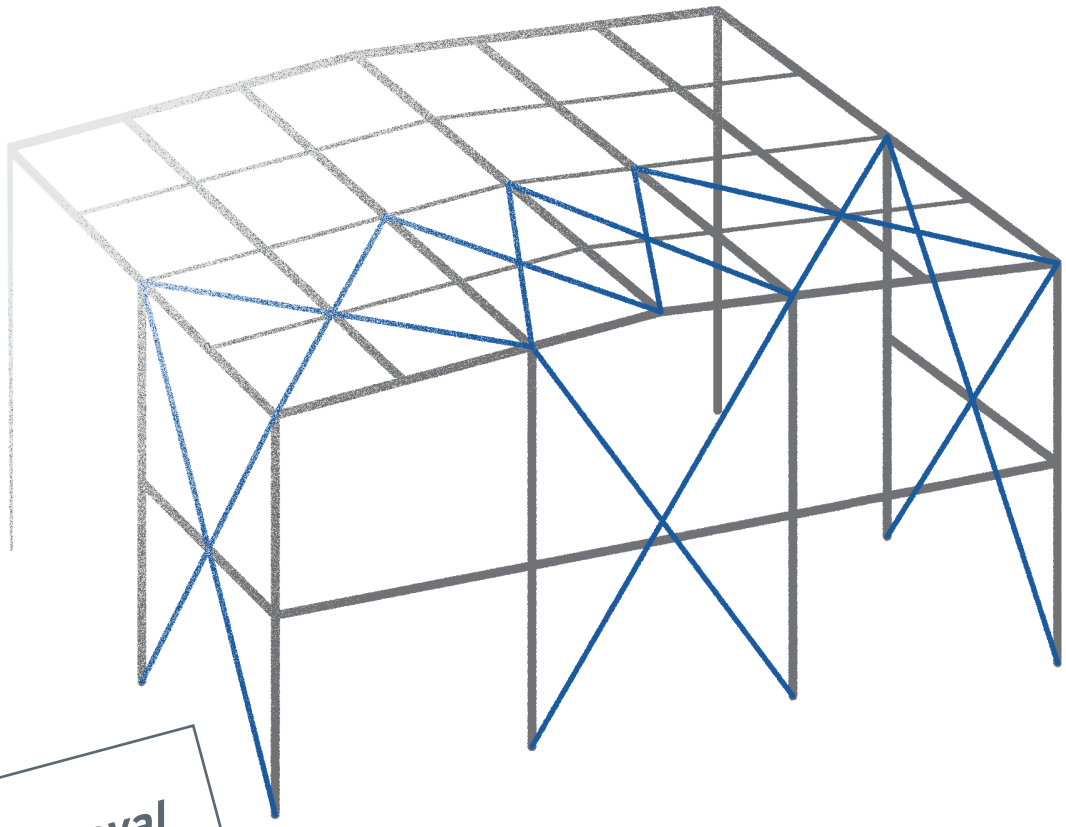
SAS LokTie

Manual





DIBt approval
Z-14.4-565

SAH
Stahlwerk Annahütte

SAS SYSTEMS

Stahlwerk Annahütte Max Aicher GmbH & Co. KG
Max-Aicher-Allee 1+2 / D-83404 Ainring-Hammerau
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Manual

SAS LokTie

Approval Z.14.4-565

Deutsches Institut für Bautechnik

(DIBt)

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author: J. Schmidt

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T. Paukner

Stahlwerk Annahütte (SAH) is a specialist for hot rolling thread bars with diameters 12 to 75 mm. The wide range of different diameters and steel grades offers the opportunity for different applications. Due to the high quality our connecting and fixing systems are used world wide in different applications: formworking, reinforcing, geotechnics, post-tensioning or anchoring. Specially for bracing and frame structures, the SAS LokTie was developed and approved.

SAH is accredited acc. to ISO 9001:2008.

1. Scope:

This manual is valid together with the approval Z-14.4-565 of Deutsches Institut für Bautechnik and provides a basis for the construction of the SAS LokTie.

2. Dimension:

The SAS LokTie is available for the diameters 15, 20 and 26.5 mm. Details acc. to the approval Z-14.4-565, Ann. 1 to 9.

3. Corrosion protection:

All elements of the SAS LokTie are hot-dip galvanized.

4. Limit tensile force of the SAS LokTie:

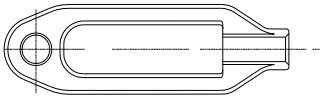
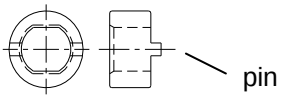
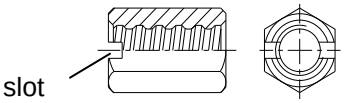
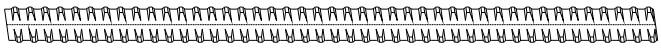
The following limit tensile forces ($N_{R,d}$) of the SAS LokTie have to be considered:

Tab. 1: Limit tensile forces ($N_{R,d}$)

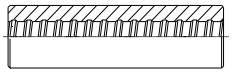
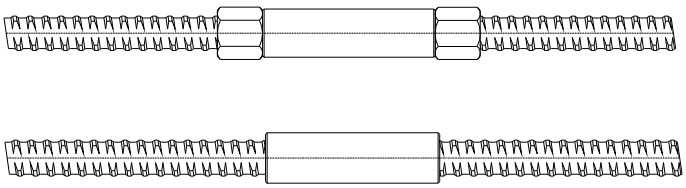
	$N_{R,d}$ [kN]	
Ø [mm]	without coupler	with coupler
15	92,1	73,3
20	154,7	121,5
26,5	290,1	274,5

The joint between the SAS LokTie and the construction has to be proofed separately. For a 2-shear joint the limit bearing stress force for the LokTies is equivalent to the limit tensile force $N_{R,d}$ of the tie rod system without a coupler. For a 1-shear joint the limit bearing stress force of the LokTies is 0.83-times the value of the limit tensile force of the SAS LokTie without a coupler.

5. Elements of the SAS LokTie:

Threaded LokTie	
Non-threaded LokTie	
Holding collar	
Locking nut	
Thread bar	

Optional:

Coupler	
Lock nut (only for fixation)	
Coupler joint with and without lock nuts (can be cut and coupled at any designed length of the thread bar)	

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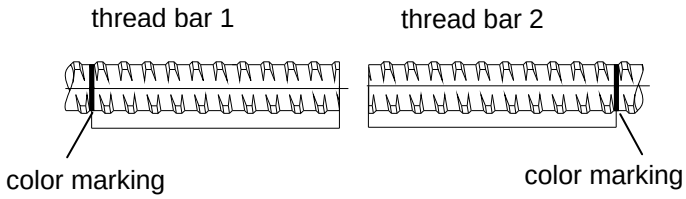
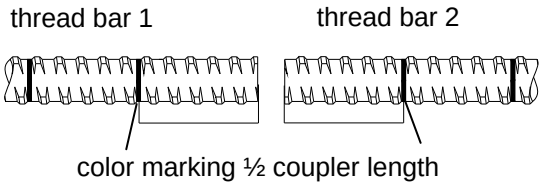
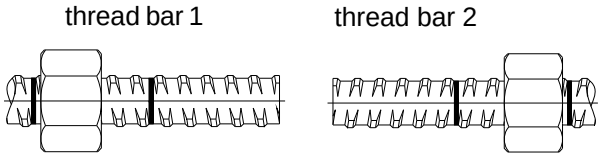
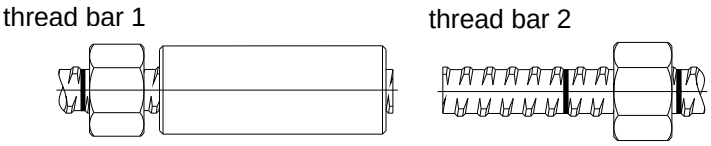
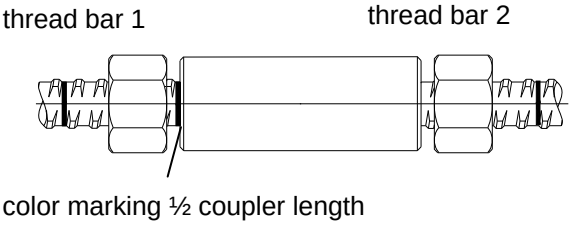
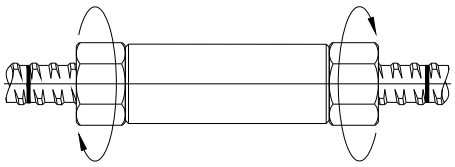
Installation of the coupler joint <u>with</u> lock nuts (optional):

1. Make a permanent color marking 20 cm from the end of thread bar 1. To controll later the middle position of the coupler.	
2. Make a second color marking on thread bar 1 – ½ coupler length - from the end of the thread bar (depending of type of coupler).	
3. Optional: Screw the lock nut on thread bar 1 and thread bar 2. (Attn.: Lock nuts only for fixation).	
4. Screw the coupler completely on thread bar 1.	
5. Screw the coupler on thread bar 2 as far as you see the color marking of thread bar 1 (control). Then screw the thread bar 2 into the coupler until both thread bar ends are in contact.	
6. Torque the lock nuts with a wrench against the coupler.	

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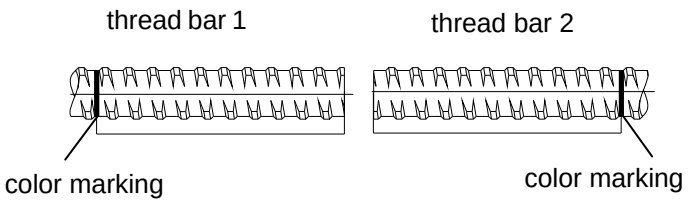
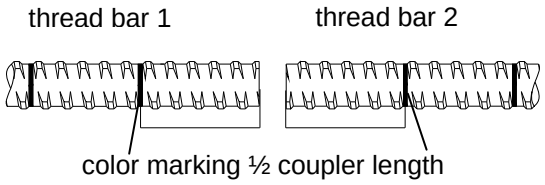
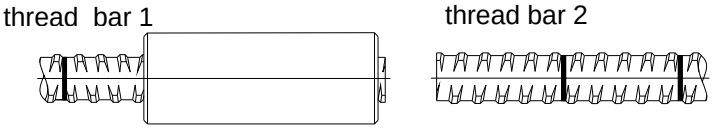
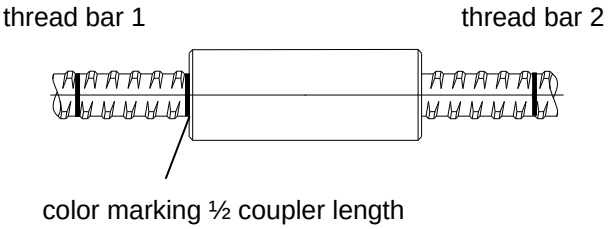
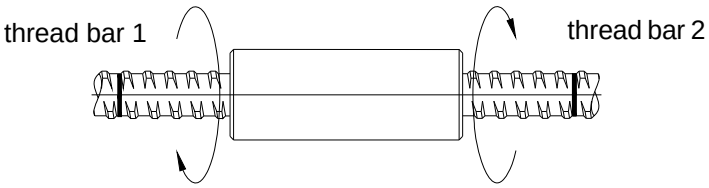
Installation of the coupler joint <u>without</u> lock nuts:

1. Make a permanent color marking 20 cm from the end of thread bar 1. To controll later the middle position of the coupler.	
2. Make a second color marking on thread bar 1 – ½ coupler length - from the end of the thread bar (depending of type of coupler).	
3. Screw the coupler completely on thread bar 1.	
4. Screw the coupler on thread bar 2 as far as you see the color marking of thread bar 1 (control). Then screw thread bar 2 into the coupler until both thread bar ends are in contact.	
5. Torquing of thread bar 1 and thread bar 2 against each other until both thread bars can not dismantle out of the coupler.	

6. Length of the thread bar

The designing of the length of the thread bar and the screwing length of the thread bar into the LokTies is explained in the approval Z-14.4-565, Ann. 1.

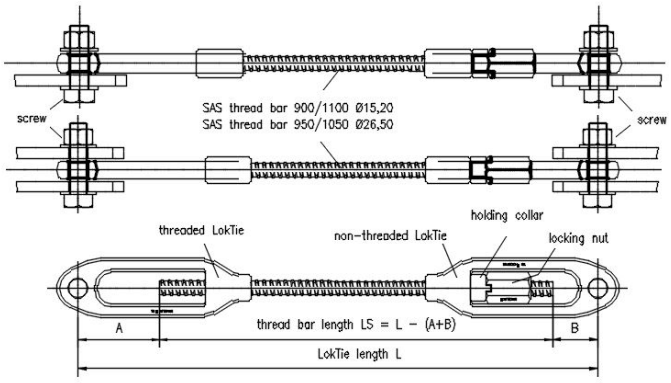


Fig 1: 1- and 2-shear joint without coupler

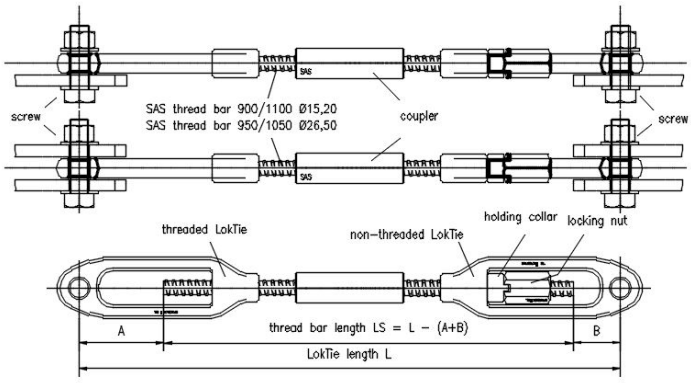


Fig 2: 1- and 2-shear joint with coupler

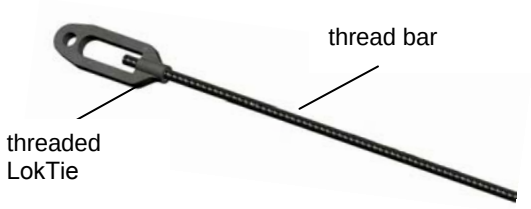
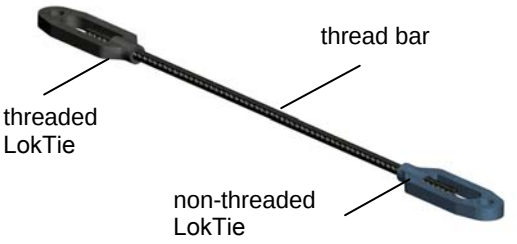
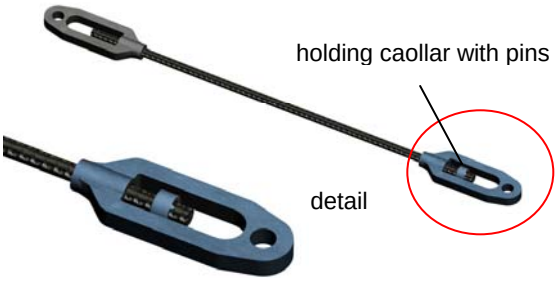
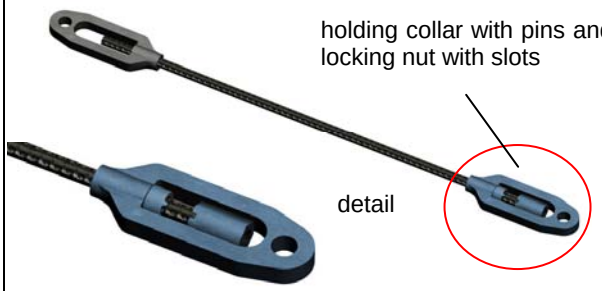
Tab. 2: length of the thread bar and screws for the construction

thread bar-Ø [mm]	A [mm]	B [mm]	screw
15	130 bis 80	65 bis 45	M20
20	150 bis 95	70 bis 50	M24
26,5	190 bis 120	85 bis 60	M30

7. General advices:

a. Before installation, all elements have to be checked concerning quality and functionality.
b. It is not allowed to use destroyed or damaged elements. Those elements have to be excluded from all further application.
c. Be careful with weld spatters, keep distance to welding.
d. Weld spatters and abrupt loading on the elements of the SAS LokTie are unallowable.

8. Installation of the SAS LokTie:

1. Screw the threaded LokTie on a free end of the thread bar. (screwing length acc. to approval Z-14.4-565, Ann. 1)	
2. Slip the non-threaded LokTie on the other free end of the thread bar. (slipping length acc. to approval Z-14.4-565, annex 1)	
3. Slip the holding collar on the thread bar into the non-threaded LokTie. The pins of the holding collar have to be directed to the free end of the thread bar.	
4. Screw the locking nut on the thread bar into the non-threaded LokTie. The slots of the locking nut have to be directed to the pins of the holding collar.	
5. The pins of the holding collar have to be inserted into the slots of the locking nut. Locking nut and holding collar have to be hand-screwed torqued against the non-threaded LokTie.	

9. Assembly of the SAS LokTie:

For 1- and 2-shear joints screws are used for the connection of the SAS LokTie with the construction. The screw joint is not part of the approval Z-14.4-565 and has to be proofed for each application separately. In case of application without bending DIN 18800-1:2008-11, element (802) has to be considered.

Fig. 3: Example: an application of SAS LokTie in industrial facilities.

10. Stressing of the SAS LokTie:

With a wrench the stressing of the SAS LokTie is uncomplicated, fast and safe.
For stressing put the wrench on the thread bar and screw the thread bar further into the threaded LokTie, That`s all, the thread bar is stressed.
If a coupler is used, take care that the thread bars can not unscrew out of the coupler through stressing with the wrench – take care of the rotating direction! Afterwards, a visual controlling of the coupler joint is absolutely necessary.

Fig. 4: Construction of the LokTie

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PHG: Verbundbau Mitterfelden GmbH, AG Traunstein, HRB 252
Stahlwerk Annahütte Beteiligung GmbH, AG Traunstein, HRB 8742

Geschäftsführer:
Katharina Eisl
Peter Meyer
Dr. Zoltán Taszner

Zertifiziert nach
DIN EN ISO 9001:2000
ISO/TS 16949:2002

Empfehlung für Bemessung / *Design Recommendation*

SAS LokTie Zugstabsystem / *SAS LokTie tie rod system*

∅	Gewicht Stab / *weight thread bar*	Gewicht LokTie / *weight LokTie*	Schrauben für Zugstabsystem / *bolts for the tie rod system*	**Grenzzugkräfte des Zugstabsystems / *limit tensile force of the tie rod system* $N_{R,d}$**	
DN	$G_{Stab\ /\ thread\ bar}$	G_{LokTie}	Größe / *size*	ohne Muffenstoß / *without coupler*	mit Muffenstoß / *with coupler*
[mm]	[kg/m]	[kg/set]	[-]	**[kN]**	**[kN]**
15	1,44	2,3	M20	**92,1**	**73,3**
20	2,56	4,1	M24	**154,7**	**121,5**
26,5	4,48	8,7	M30	**290,1**	**274,5**

Die Verbindung des SAS LokTie Zugstabsystems mit der Anschlusskonstruktion ist gesondert nachzuweisen. Bei einer 2-schnittig ausgeführten Anschlusskonstruktion entspricht die Grenzlochleibungskraft der LokTies der Grenzzugkraft $N_{R,d}$ des Zugstabsystems für die Ausführung ohne Muffenstoß. Bei einer 1-schnittig ausgeführten Anschlusskonstruktion entspricht die Grenzlochleibungskraft der LokTies den 0,83-fachen Werten der Grenzzugkraft $N_{R,d}$ des Zugstabsystems für die Ausführung ohne Muffenstoß.

The joint between the tie rod system and the construction has to be proofed separately. For a 2-shear joint the limit bearing stress force of the LokTies is equivalent to the limit tensile force $N_{R,d}$ of the tie rod system without a coupler. For a 1-shear joint the limit bearing stress force of the LokTies is 0.83-times the value of the limit tensile force of the tie rod system without a coupler.

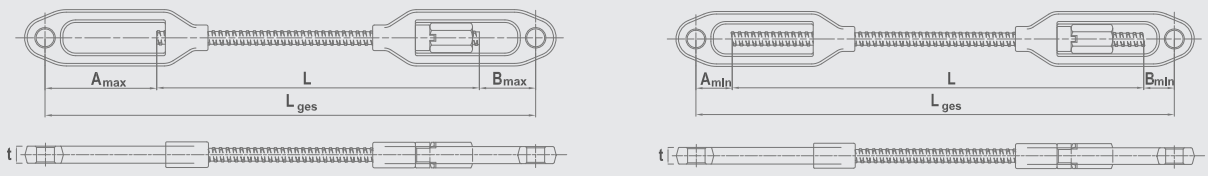
erforderliche Länge (L) SAS Gewindestab / *required length (L) SAS thread bar*

SAS Gewindestab / *SAS thread bar* ∅ 15 mm:
$L = L_{ges} - (A + B)$ mit / *with* $A_{max} = 130$, $A_{min} = 80$ mm, $B_{max} = 65$, $B_{min} = 45$ mm

SAS Gewindestab / *SAS thread bar* ∅ 20 mm:
$L = L_{ges} - (A + B)$ mit / *with* $A_{max} = 150$, $A_{min} = 95$ mm, $B_{max} = 70$, $B_{min} = 50$ mm

SAS Gewindestab / *SAS thread bar* ∅ 26,5 mm:
$L = L_{ges} - (A + B)$ mit / *with* $A_{max} = 190$, $A_{min} = 120$ mm, $B_{max} = 85$, $B_{min} = 60$ mm

Dicke (t) LokTie / *thickness (t) LokTie*	**Bestell Nr. / *order no.***
∅ 15 mm t = 21,5 mm	Nr. / *no.* 15F80120FV
∅ 20 mm t = 25,5 mm	Nr. / *no.* 20F80124FV
∅ 26,5 mm t = 31,5	Nr. / *no.* 26E80130FV



weitere Details siehe DIBt Zulassung Z-14.4.565 / *more details acc. to DIBt approval Z-14.4-565*

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Stand / *date* 12/2014

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