



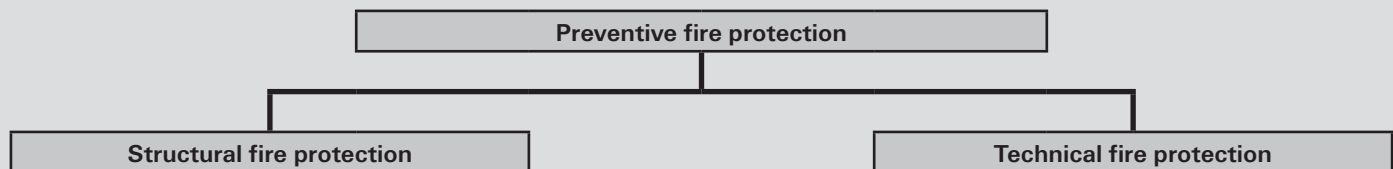
fischer fixings for sprinkler systems



fischer 
innovative solutions

Sprinkler systems. Efficient fire alarm and extinguishing systems!

Fire protection is not to be equated with sprinkler systems:



■ Protection goals in fire protection

Firstly, fire protection serves to protect people, and is regulated by the building laws in the respective countries (or regional states). As standard, fire protection is ensured by structural fire protection measures of compartmentation as fire-resistant walls and ceilings. Secondly, fire protection serves to protect property and this is regulated by the insurance associations, such as VdS and FM. These requirements partially go beyond the building legislation.

Technical fire protection such as alarm and fire extinguishing systems, which also include sprinkler systems, has to be designed using approved or recognised components in accordance with the selected guideline.

■ Sprinkler systems are alarm and fire extinguishing systems

Sprinkler systems belong to the group of extinguishing systems, which usually cover the whole areas. This means that sprinklers are usually installed in all rooms of a building and are designed in accordance with the actual fire hazard.

This factor also turns the sprinkler system into an alarm system, because the temperature-dependent opening of a sprinkler activates an acoustic alarm and usually a signal is sent to the fire alarm system. In addition, sprinkler systems' fire extinguishing rates have been very high since decades, which is why sprinkler systems are the standard in some types of buildings.

Examples of use:

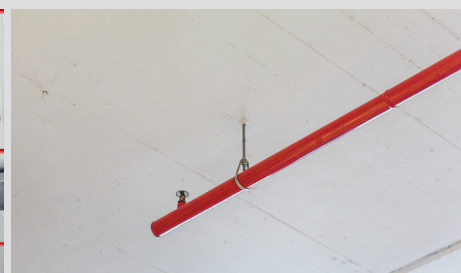
- Industrial companies
- High-bay warehouses
- Office buildings
- Logistics areas
- Public buildings and institutions
- Sales entities
- High-rises
- Underground garages
- Museums
- Congress and conference centres



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Fastening of sprinkler systems

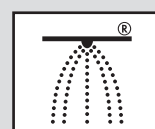
- In general, sprinkler systems are designed according to different standards. For example, according to the VdS standard (VdS CEA 4001), the American FM standard 1951 (Factory Mutual Insurance Company (FM Global)), UL 203 (Underwriters Laboratories (UL)), according to NFPA 13 regulations (National Fire Protection Association (NFPA)) or to EN 12845.
- The European CEA 4001 regulation was issued in 1995 by the insurance industry in cooperation with the manufacturers' association EUROFEU and was issued in Germany in the year 2003 by the VdS Schadenverhütung GmbH as VdS CEA 4001.
- EN 12845 was drawn up based on CEA 4001 issued in 1995 and the VdS CEA 4001 issued in 2003, so that a nearly identical standard was developed. National practices, for Germany for example, shall be included in the reviewed DIN 14489 as a national annex to DIN EN 12845.
- The American regulations correspond with regard to their requirements on pipework fixing, but there are differences in detail that have to be observed.



Certificate



Sign of conformity VdS CEA 4001 in concrete ceilings:



Requirements on pipe hangers

- The category of pipe hangers also include – apart from pipe clamps or loops – all other types of fastening elements such as plugs, anchors, beam clamps, trapezoidal sheet holders, etc.
- Various load values, distances between pipe hangers and connection sizes for pipe loops and clamps, which are listed in the following table for the most common regulations, apply for sprinkler pipe fixings.

Pipe size	FM1951				NFPA13 Schedule 40-Pipe weight incl water				VdS CEA 4001		
	Test load	Max. distance	Min. thread size		Calculated test load	Max. distance	Min. thread size		Minimum load-capacity	Max. spacing	Min. thread size
spacing	[kN]	[m]		[inch]	[kN]	[m]	[metric]	[inch]	[kN]	[m]	
thread size	—	—	—	—	1,4	3,60	9,5	3/8	2,0	4,00	M8
20	1,512	3,6	M10	3/8	1,5	3,60	9,5	3/8	2,0	4,00	M8
25	1,824	3,6	M10	3/8	1,7	3,66	9,5	3/8	2,0	4,00	M8
32	1,913	3,6	M10	3/8	1,9	3,66	9,5	3/8	2,0	4,00	M8
40	2,313	4,6	M10	3/8	2,4	4,57	9,5	3/8	2,0	4,00	M8
50	2,825	4,6	M10	3/8	2,9	4,57	9,5	3/8	3,5	4,00	M10
65	4,181	4,6	M10	3/8	3,8	4,57	9,5	3/8	3,5	6,00	M10
80	4,715	4,6	M10	3/8	4,8	4,57	9,5	3/8	3,5	6,00	M10
90	5,583	4,6	M10	3/8	5,7	4,57	9,5	3/8	3,5	6,00	M10
100	6,561	4,6	M10	3/8	6,7	4,57	9,5	3/8	5,0	6,00	M10
125	8,896	4,6	M12	1/2	9,0	4,57	12,7	1/2	5,0	6,00	M12
150	11,632	4,6	M12	1/2	11,8	4,57	12,7	1/2	8,5	6,00	M12
200	16,903	4,6	M12	1/2	18,2	4,57	12,7	1/2	8,5	6,00	M16
250	26,044	4,6	M16	5/8	26,7	4,60	15,9	5/8	10,0	6,00	M18
300	35,141	4,6	M16	5/8	36,0	4,60	15,9	5/8	12,5	6,00	M20
350	—	—	—	—	42,9	4,60	—	—	—	6,00	—
400	—	—	—	—	55,7	4,60	—	—	—	6,00	—
450	—	—	—	—	70,1	4,60	—	—	—	6,00	—
500	—	—	—	—	84,4	4,60	—	—	—	6,00	—

Requirements on fixings for sprinkler pipes.

Anchor acc. to CEA 4001 – 15.2.4 anchorage in concrete ceilings

Anchors require building authority approval as follows:

- Single fixings in cracked concrete (European technical approval acc. to ETAG 001/part 1-4 opt. 1-6).
- Multiple fixings for non-structural constructions (European technical approval acc. to ETAG 001/part 6).
- Comparable national approvals such as the still valid building authority approvals of the Deutsches Institut für Bautechnik (DIBt, German Institute for Structural Engineering) for anchors for anchoring of light ceiling cladding and suspended ceilings are equivalent to approvals acc. to ETAG 001/part 6.

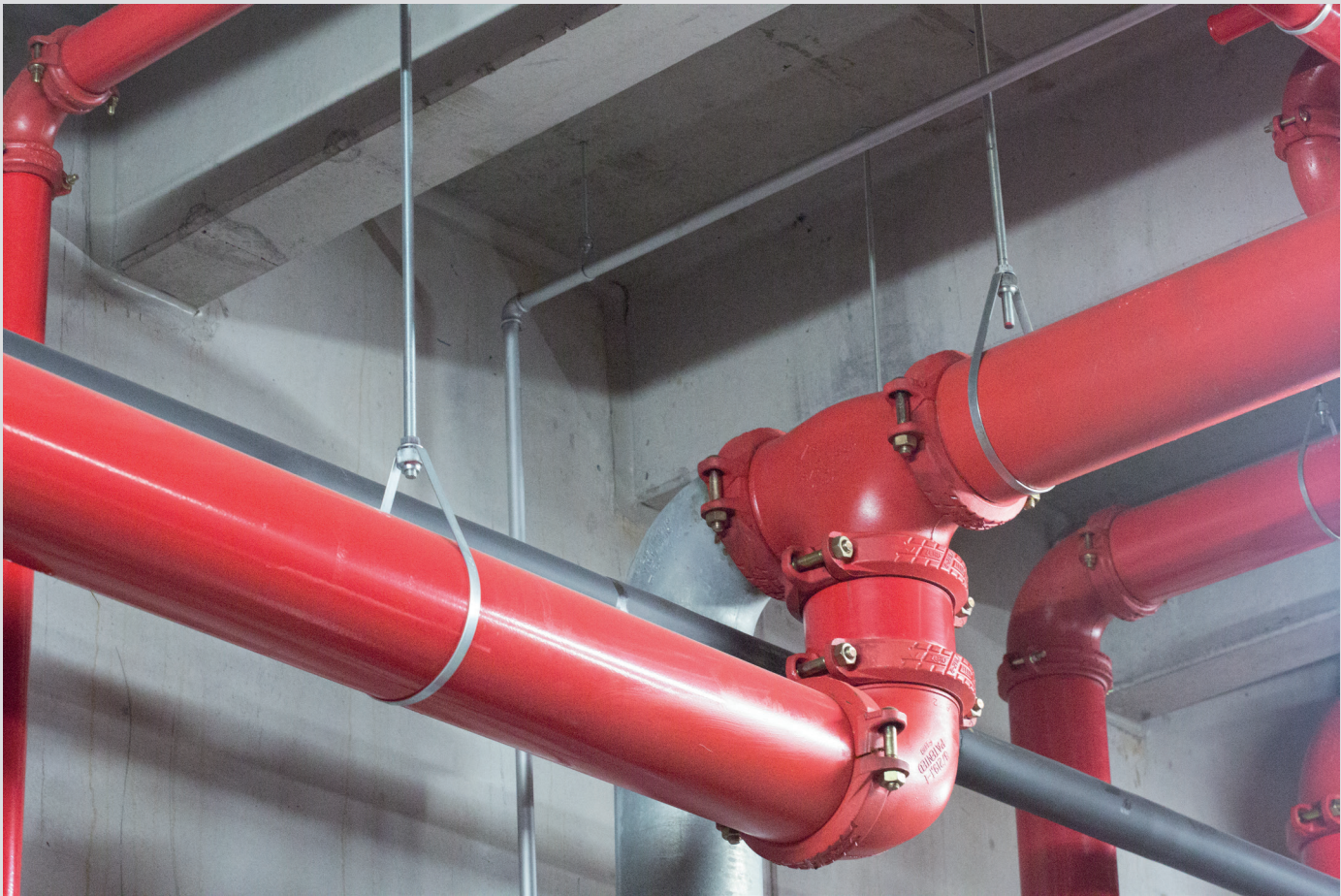
Anchor design is based on the building authority approval. With regard to their tensile load capacity (failure of steel, $N_{Rk,s}$) and threaded connection (if available), anchors have to comply with the requirements of the following table.

Certificate



Use as ceiling fixing for pipework with internal pipe diameter D	Min. size of threaded connection	Characteristic tensile load capacity
		$N_{Rk,s}$ [N]
$D \leq DN 50$	M8	≥ 6.000
$DN 50 < D \leq DN 100$	M10	≥ 10.500
$DN 100 < D \leq DN 150$	M12	≥ 15.000
$DN 150 < D \leq DN 200$	M16	≥ 25.500
$DN 200 < D \leq DN 250$	M20	≥ 30.000
$DN 250 < D \leq DN 300$	M20	≥ 37.500

VdS CEA 4001 – Table 15.04: Minimum tensile load capacity and minimum size of threaded connection



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Anchors according to NFPA 13 – 9.1.3 Fixings in concrete

- Basically, NFPA13 – 9.1.1.4 specifies that all pipe fixing components, which support the pipe and all elements connecting the pipe fixing with the building structure have to be listed according to the regulations.
- The load capacity as stipulated by NFPA13 – 9.1.1 and indicated in the table (page 3) with calculated test loads also applies to plugs and anchors.

This means:

If one compares the test loads of American standards with characteristic loads of European standards, it is apparent that there is a harmonisation of load levels. Thus, it is possible to use the same plugs and anchors in dependence of listing, approval or compliance with the regulations for the same applications in sprinkler systems.

Anchors according to FM1951 – 3.2 Technical and constructional properties










- As a rule, the same regulation shall apply as defined in NFPA13 – 9.1.1.4, which stipulates that all pipe fitting components supporting the pipe and all elements connecting the pipe fitting to the building structure have to be listed according to the regulations. (FM-approved)
- In section 3.2.2, anchor requirements (the parts of the pipe support connecting it to the building structure) are specified as follows:

Pipe size	Threaded connection	Test load (N)
3/4" – 4"	M10 (3/8")	6561
5", 6", 8"	M12 (1/2")	16903
10", 12"	M16 (5/8")	35141

Requirements on plugs or anchors for other types of mounting surfaces

- In addition to fixings in concrete surfaces, there are also other mounting surfaces such as various kinds of light-weight concrete as well as aerated concrete or other types of masonry. Steel constructions with different shapes of steel beams and timber constructions are also available as mounting surfaces. And all of these are considered in the regulations.
- Here again the used fastening elements have to be in accordance with the regulations' requirements.

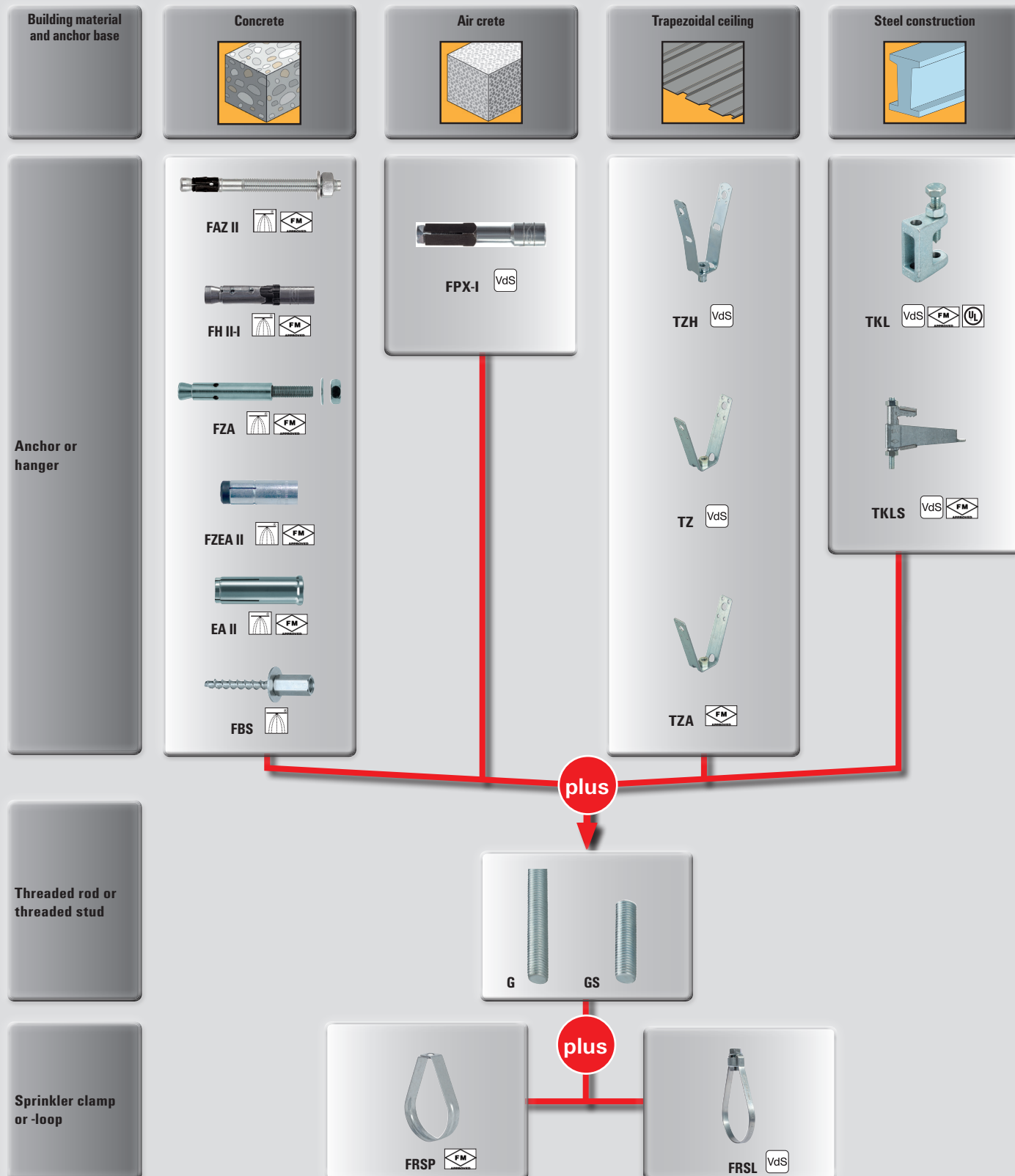
Overview of anchor approvals and applicability for sprinkler fixings

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Type	ETA concrete single	ETA concrete multiple	ETA air crete	VdS- compliant	VdS- approved	FM- approved
FAZ II	Option 1			✓		✓
FBS	Option 1	✓ (FBS G)		✓		
FH II	Option 1			✓		✓
FZA	Option 1			✓		✓
FZEA II	Option 1			✓		✓
EA II	Option 7	✓		✓		✓
FNA II		✓		✓		
FPX-I			✓		✓	




Key:
 ETA concrete, single, option 1 = suited for cracked and non-cracked concrete
 ETA concrete, single, option 7 = suited for non-cracked concrete
 ETA concrete, multiple = suited for cracked and non-cracked concrete

Fixing solutions for sprinkler systems. Flexibility guaranteed.






Sprinkler pipe hanger components of fischer



Product overview.

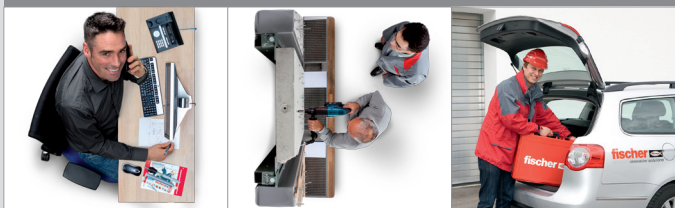
	Type	Art.-No.	[Zoll] / [mm]
	FRSL 34	513302	1"
	FRSL 43	513303	1 1/4"
	FRSL 49	513304	1 1/2"
	FRSL 60	513307	2"
	FRSL 76	513308	2 1/2"
	FRSL 90	513309	3"
	FRSL 115	513310	4"
	FRSL 140	513311	5"
	FRSL 170	513312	6"
	FRSP 1/2"	524035	1/2"
	FRSP 3/4"	524036	3/4"
	FRSP 1"	524037	1"
	FRSP 1 1/4"	524038	1 1/4"
	FRSP 1 1/2"	524039	1 1/2"
	FRSP 2"	524040	2"
	FRSP 2 1/2"	524041	2 1/2"
	FRSP 3"	524042	3"
	FRSP 4"	524043	4"
	FRSP 5"	524044	5"
	FRSP 6"	524045	6"
	FRSP 8"	524046	8"
	ETR 8 - 13	024415	M 6
	ETR 12 - 17	024416	M 6
	ETR 15 - 21	024417	M 6
	ETR 20 - 27	024418	M 8
	ETR 26 - 34	024419	M 8
	ETR 33 - 42	024420	M 8
	ETR 40 - 49	024421	M 8
	ETR 50 - 60	024422	M 8
	ETR 60 - 70	024423	M 10
	ETR 66 - 76	024424	M 10
	ETR 70 - 82	024425	M 10
	ETR 80 - 90	024426	M 10
	ETR 90 - 102	024427	M 12
	ETR 100 - 108	024428	M 12
	ETR 102 - 114	024429	M 12
	ETR 121 - 127	024430	M 12
	ETR 126 - 133	024431	M 12
	ETR 131 - 140	024432	M 14
	ETR 143 - 153	024433 1)	M 14
	ETR 150 - 159	024434	M 14
	ETR 168	024435	M 14
	ETR 193,7	024436	M 14
	ETR 219	024437	M 14

1) delivery on request only

	Type	Art.-No.	[Zoll] / [mm]
	G 8	079740	1000
	G 10	079744	1000
	G 12	020957	1000
	G 16	020958	1000
	G 8/2	079741	2000
	G 10/2	079745	2000
	G 12/2	579746	2000
	G 10/3	557092	3000
	G 12/3	064056	3000
	GS 8/25	079750	25
	GS 8/40	079751	40
	GS 8/50	079752	50
	GS 8/60	079753	60
	GS 8/70	079754	70
	GS 8/80	079755	80
	GS 8/90	079756	90
	GS 8/100	079757	100
	GS 8/150	079758	150
	GS 8/200	079759	200
	GS 10/25	079765	25
	GS 10/40	079766	40
	GS 10/60	079767	60
	GS 10/80	079768	80
	GS 10/100	079769	100
	GS 10/120	079770	120
	GS 10/150	079771	150
	GS 10/200	079772	200
	TKL L M 8	064055	M 8
	TKL M 8	079687	M 8
	TKL L Ø 9	077605	Ø 9
	TKL M 10	079688	M 10
	TKL Ø 11	079689	Ø 11
	TKL M 12	020949	M 12
	TKL Ø 13	043275	Ø 13
	SS-TKL M10/M12	048154	M10/M12
	TKLS Ø 9	531134	Ø 9
	TKLS Ø 11	531136	Ø 11
	TKLS Ø 13	531137	Ø 13
	TKLS Ø 17	531138	Ø 17
	TZ M 8	064094	M 8
	TZ M 10	064095	M 10
	TZH M 8	079825	M 8
	TZH M 10	079826	M 10
	TZA M 10	524047	M 10

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- Training sessions, some with accreditation, at your premises or at the fischer ACADEMY.
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