

## Flexible Fiber Borescopes

- Fiberscopes
- Tip Angulation 2- or 4-way
- Interchangeable  
Objective Heads

# Technology and Design

## WOLF GmbH – Flexible Fiberscopes Series TF

Uncompromised top quality flexible Fiberscopes are achieved only with meticulous selection of the materials used with perfectly harmonised component design and the highest quality in manufacturing. WOLF Fiberscopes fulfil highest requirements in optical and mechanical quality and design.

The model series TF with diameters 6.3 mm, 8.3 mm and 11.3 mm has interchangeable objective heads. 100 years experience in endoscope development and manufacturing and more than 40 years experience in the manufacturing of flexible fiberscopes ensures the maximum

benefits for our customers. The design is uncompromisingly WOLF. A standard which ensures all components can be replaced individually when damaged. The replacement of undamaged expensive components because of their attachment to a broken low cost component is virtually eliminated.



### Designed for industrial use

This fiberscope series TF is perfectly designed for industrial applications.

- multilayer robust design of the flex. shaft therefore optimum protection of the optical parts inside
- highly resistant to kinking and torsion
- watertight over the full working length of the flex. shaft,
- some models of the fiberscopes are fitted with a very robust and virtually break-proof Tungsten braid, especially the small diameter fiberscopes, others are provided with Stainless Steel braid. A polyurethane (PU) sheath can be supplied on request.
- control handle is splash proof

### Versatility

The fiberscope TF series offers a high degree of versatility:

- tip angulation 2 or 4 ways (depending on the model)
- most models are fitted with fixed light guide 2,300 mm long, allowing great freedom of movement and optimum illumination
- optional objective heads for 0°-direct view and 90° side view (only TF-6, TF-8 and TF-11)
- various fields of vision provide either a detailed close up view or a wide angle overview at TF-6, TF-8 and TF-11 through interchangeable objective heads

### Ergonomics

The control handles of all fiberscopes are designed for optimal ergonomic, easy and fatigue free handling.

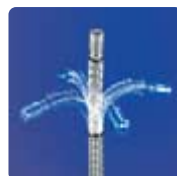
### Orientation

A small marker superimposed on the visible image through eyepiece helps the user to coordinate the control directions.

### Tip angulation

Generally all the WOLF Fiberscopes have inbuilt tip angulation which is remotely controlled. The steering mechanism is designed for extremely smooth control. The 2-way with a pivoted lever and the 4-way ones has two hand wheels.

The angulation controls can each be locked in any angulation position.



### Illumination

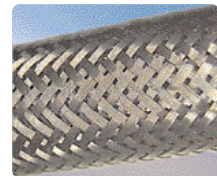
All WOLF Fiberscopes have integrated glass fibers which transfer the light from the light source to the tip of the fiberscope.

Powerful light sources for optimum illumination of the viewing area are part of the basic equipment. Please refer to the special accessory catalogue T621.

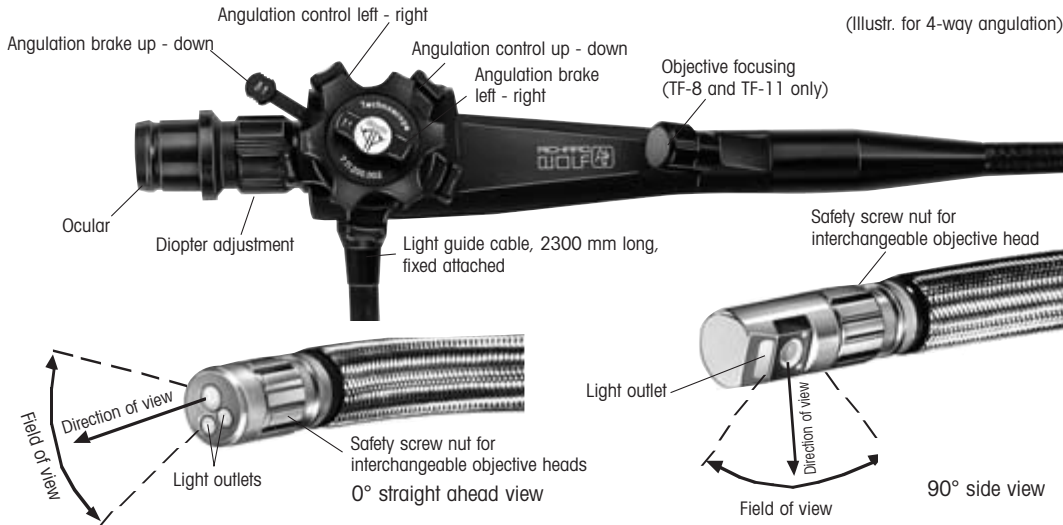
### Outer Covering

The flexible insertion shafts of all the WOLF-Fiberscopes are protected either with a very robust and virtually break-proof Tungsten braid, some models with a Stainless Steel braid or also a resistant polyurethane (PU) sheath.

The PU jacket are very easy to clean, i.e. after use in oil, metal braids glide easily over metal surfaces. This metal sheathings allow an unproblematic use in metal pipes or castings (pls.see chart page 3).



# Technical Data

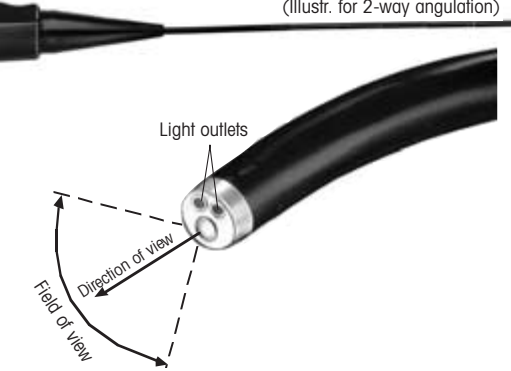


Series	Ø (mm)	Working length (mm)	Total length (mm)	Tip bending radius (mm)	Direction of view	Field of view	Depth of field (mm)	Tip angulation	Light guide (length)	Outer sheath of the flexible part	Order-No.
TFS-2.4	2,2	400	650	12	0°	60°	3-10	2-way: 150° / 90°	integrated (2300 mm)	PU Polyurethane	7.24040.001
		700	950	12	0°	60°					7.24070.001
		1100	1350	12	0°	60°					7.24110.001
	2,4	400	650	12	0°	60°	3-10	2-way: 120° / 90°	integrated (2300 mm)	Tungsten braid	7.24040.002
		700	950	12	0°	60°					7.24070.002
		1100	1350	12	0°	60°					7.24110.002
TFS-2.5	2,5	700	950	12	0°	60°	2-50	2-way: 160° / 120°	without ❶	PU Polyurethane	7.73250.172
TF-3	3,2	450	650	9	0°	90°	3-50	2-way: 180° / 90°	integrated (2300 mm)	PU Polyurethane	7.35041.001
		700	950	11	0°	90°					7.35071.001
		1100	1350	11	0°	90°					7.35111.001
		1400	1650	11	0°	90°					7.35141.001
		1900	2150	11	0°	90°					7.35191.001
	3,5	450	650	9	0°	90°	3-50	2-way: 170° / 90°	integrated (2300 mm)	Tungsten braid	7.35041.002
		700	950	11	0°	90°					7.35071.002
		1100	1350	11	0°	90°					7.35111.002
		1400	1650	11	0°	90°					7.35141.002
		1900	2150	11	0°	90°					7.35191.002
TFA-5	5,0	690	950	13	0°	90°	1-∞	2-way: 180° / 90°	without ❶	PU*	7.05065.001
	5,6	690	950	13	0°	90°				Tungsten braid	7.05065.002
lengths 1100 mm, 1400 mm and 1900 mm on request											
TF-5	5,0	1040	1370	8	0°	80°	1-∞	4-way: 180° / 140° 180° / 140°	integrated (2300 mm)	Tungsten braid ❷	7.05104.002
		1300	1620								7.05130.002

- ❶ with connector for separate WOLF light guides
- ❷ covering with PU Polyurethane on request

Series	Ø (mm)	Working length (mm)	Total length (mm)	Tip bending radius (mm)	Direction of view	Field of view	Depth of field (mm) with field of view	Tip angulation	Light guide	Outer sheath of the flexible part	Type and Order-No.	
TF-6	6,3	1320	1650	13	Standard 0° (with optional objective heads: 90°)	30° (with optional objective heads: 65° / 100°)	30°: 15-50 65°: 5-500 100°: 3-∞	4-way: + 120° / -120° + 120° / -120°	integrated, 2300 mm long	PU*	7.63140.001	
		1820	2150	13						stainless steel	7.63140.002	
										PU*	7.63200.001	
TF-8	8,3	1320	1650	20		30° (with optional objective heads: 60° / 100°)	30°: 10-∞ 60°: 3-∞ 100°: 1-∞			PU*	7.83140.001	
		1820	2150	20							stainless steel	7.83140.002
TF-11	11,3	1320	1650	35		30° (with optional objective heads: 80° / 120°)	30°: 10-∞ 80°: 3-∞ 120°: 1-∞			PU*	7.83200.001	
		1820	2150	35							stainless steel	7.83200.002
		2820	3150	35							PU*	7.11140.002
											stainless steel	7.11140.001
											PU*	7.11200.001
					stainless steel			7.11200.002				
			PU*	7.11300.001								
			stainless steel	7.11300.002								

\* PU = Polyurethane



### Image quality

By using even finer glass fibers, the already good resolution has been significantly increased. All of the thousands very thin glass fibers must be in perfect geometrie alignment. New technics in manufacturing have improved the brightness, sharpness and clarity.

### Image focusing

To compensate for differences in eyesight, the eyepiece of each WOLF fiberscopes has an ocular diopter adustment.

The model series TF-8 und TF-11 also have an objective focusing mechanism to achieve a sharp image even at extreme object distances. The sharp focus is maintained even when the fiberscope is bent.

### Interchangeable objective heads for series TF-6

Direction of view	Field of view	Order-No.
0°	65°	7.00063.60
	100°	7.00063.10
90°	30°	7.00063.39
	65°	7.00063.69
	100°	7.00063.109

### Interchangeable objective heads for series TF-8

Direction of view	Field of view	Order-No.
0°	60°	7.00083.60
	100°	7.00083.10
90°	30°	7.00083.39
	60°	7.00083.69
	100°	7.00083.109

### Interchangeable objective heads for series TF-11

Direction of view	Field of view	Order-No.
0°	80°	7.00011.80
	120°	7.00011.12
90°	30°	7.00011.39
	80°	7.00011.89
	120°	7.00011.129

### Field of view

The image angle of all the flexible fiberscopes define the field of view . The model series TF-6, TF-8 und TF-11 allows through the interchangeable objective heads a change of the field of view.

- 30° image angle - small field of view Sichtfeld but strong magnification (detailed view)
- 60°/65° image angle - normal field of view, medium magnification (standard)
- 80° or 100° image angle - large field of view, low magnification (wide angle, panoramic view)
- 120° image angle - super wide angle for close proximity range



Image angle (field of view) 30° / 65° / 100°

### Documentation

All flexible WOLF fiberscopes are suitable for photography and video.

Special optical and mechanical adapters are available as accessories. This are very easy and fast to connect on the fiberscope eyepieces. (pls. see accessories catalogue T621)

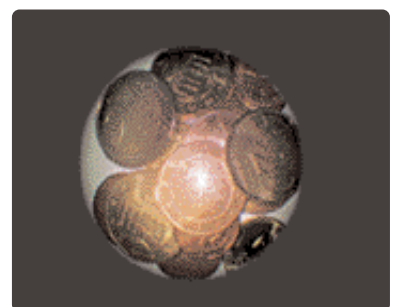
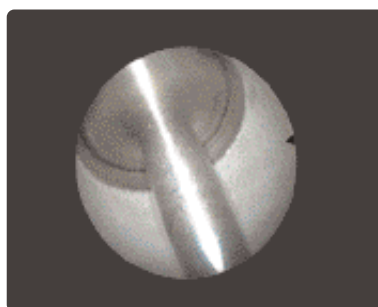
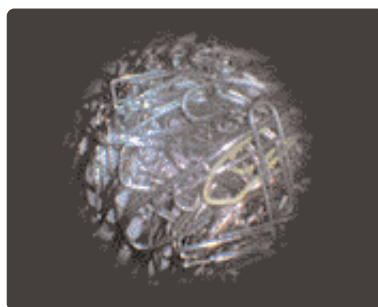
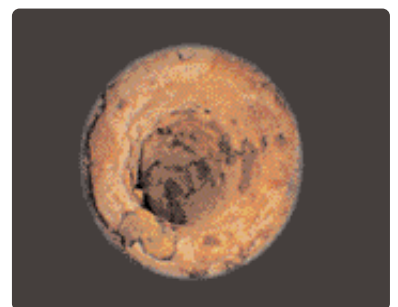
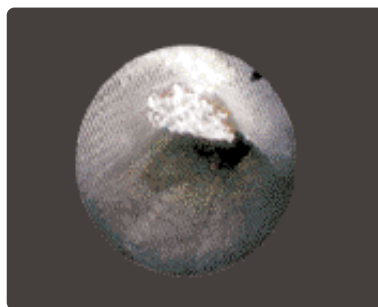
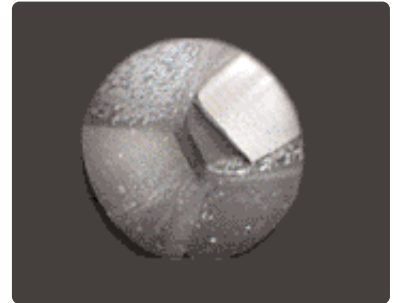
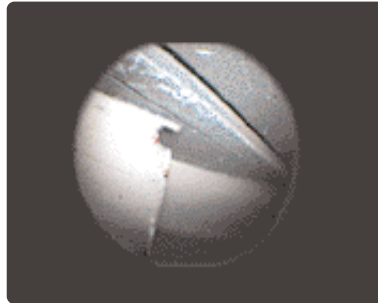
### Recommended accessory

Articulated tripod arm to secure flexible or rigid technoscopes in use. The stable articulated tripod arm has a central lock mechanism for three joints (one knee, two ball joints), two universal clamps with one clamping range of 6 to 55 mm each, including rubber pads in each clamping jaw. The special design of the clamping jaws permit fitting to round as well as flat parts.



	Order no.:
Articulated arm	1.29100.10
Universal clamp	1.29100.20

An additional camera rail also permits the attachment of a camera or a video camera by means of a 1/4" tripod thread.





## Other WOLF Products

### Rigid Borescopes

various diameters, working lengths and viewing directions

### Videoscopes TVP

various diameters, working lengths and models  
4-way angulation  
interchangeable objective heads (TVP-6)

### Swivel Prism Borescopes TSP

various diameters, working lengths,  
some models with QuickZoom focusing

### Elastoscopes TES (rigid but bendable)

various lengths, direct view and side view,  
diameter 2.4 mm only

### Special-Technoscopes/Borescopes

Blending Scopes TBS  
Contact Measuring Scopes CMS  
Diesel Roughness Measuring Scope System TRS  
Panoramic-view Technoscopes TRB

### Light Sources

with Halogen and Xenon lamps  
Battery Xenon light source

### Documentation Accessories

Video show case  
Analogue video USB box  
Image storage on USB-stick  
Digital photo camera and adapter  
and many things more...

Please ask for special brochures!

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