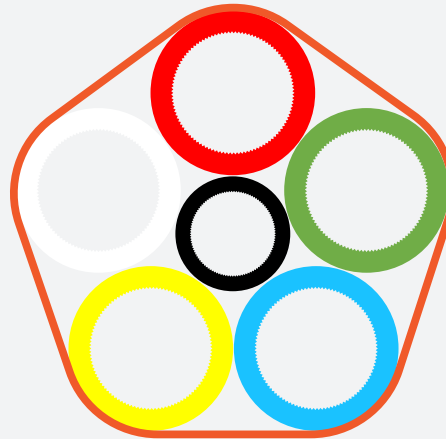# HÖHLE

TECHNICAL DATA SHEET

HÖHLE
microduct bundles
5x20/16 mm +
1x14/10 mm DB

Höhle microducts are designed for long term protection of fiber optical cables. Direct Bury (DB) type of microducts are thick wall products that attain their mechanical robustness and functional performance through their intrinsic thick walls and need no further protection at underground installations.

APPLICATION AREA:
The substantial wall thickness of the microduct and the type of raw material means this bundle can be used in as a **direct buried** product where the product is installed straight into the ground as well as a **direct install** product, where it is installed into an existing duct.

CONSTRUCTION OF THE PRODUCT:
Höhle microduct bundles are made of high density halogen free polyethylene – HDPE. Every microduct has a permanent, co-extruded silicone compound inner liner giving a coefficient of friction of less than 0,1. The inner surface of microduct can be manufactured with longitudinal grooves or with a smooth finish.

The bundle has a sheath suitable for installation, handling and marking.

VISUAL APPEARANCE:
The colours of microducts and the colour of the sheath as well as the placement of coloured microducts in a bundle are fully customizeable. Both options – fully coloured microducts or natural colour with coloured stripes – are available.

METALLIC TRACING WIRE IS AVAILABLE AS AN OPTION:
For detecting installed bundle of microducts during its installed lifetime. The inclusion of tracing wire must be specified by the customer when ordering.

HÖHLE

SingleHöhle microduct					
Duct type	OD	ID	inner clearance test	min bending radius	install tensile force
	mm	mm	% of ID	mm	N
20 / 16	20 +/- 0,2	16 +/- 0,2	85	200	max 2000
14 / 10	14 +/- 0,1	10 +/- 0,1	85	140	max 1100
test method	EN 50411-6-1:2011 Annex A:A1		IEC 60794-1-21 full lenght		

MultiHöhle microduct bundle					
configuration	microduct OD	microduct ID	bundle min x max	min bending radius	install tensile force
	mm	mm	mm	mm	N
5 x 20 / 16 + 1 x 14 / 10	20 +/- 0,2	16 +/- 0,2	58 x 58	580	max 11000

Recommendations		
Temperature ranges	for installation	-15 ... +50°C
	transport, storage, operation	-45 ... +70°C
Fibre Optical Cable dimensions for blowing		4,5 ... 11 mm
Outdoor exposure without protection		up to 12 months

Mechanical characteristics			
Criteria	Test Method	Examination	Requirements
Pressure withstand	IEC 60794-1-22, Method F13	temp 20°C, duration 30 min; 2,5x installation pressure	no leaks*
	IEC 60794-1-22, Method F13	temp 40°C, duration 24h; 1,3x installation pressure	no leaks*
	EN 50411-6-1:2011 Annex B	temp 20°C, duration 30 min; 18 bar	no leaks*
Tensile performance	IEC 60794-1-21, Method E1	test length >1m, tensile load 1070N, load 10 min	no damage**
Kinking	IEC 60794-1-21, Method E10	temp 23 +/- 3°C; 20x OD	no kinking, d=C/ π
Crush	IEC 60794-1-21, Method E3A	test length 250mm, load 2kN, duration 1 min, recov 1h	no damage**
Impact	IEC 60794-1-21, Method E4	impact energy 15J, striking surface radius 300mm	no damage**
Bending	IEC 60794-1-21, Method E11B	mandrel diam 40x OD, 3 cycles	no damage**
Repeated bending	IEC 60794-1-21, Method E6	bending diam 40x OD, 25 cycles	no damage**
Inner clearance test	IEC 60794-1-21, Annex E	to confirm inner diameter with steel ball in diameter 85%	passes full lenght
Coefficient of Friction	IEC 62470	tension around a curve 1040mm	CoF less than 0,1

(*)   *Under visual examination without magnification the microduct shall show no damage*

(**)   *Under visual examination without magnification the microduct shall show no damage and the test piece shall pass inner clearance test after recovery time.*

Höhle production quality control plan follows EN 50411-6-1 and IEC 60974-5-10 requirements.

WE VALUE ENVIRONMENTAL AND SUSTAINABLE WAY OF ACTING:
- Our wooden drums could be re-used – please contact Trumlitagastus OÜ **www.trumlitagastus.ee**
- All plastic materials left would be recycled by Weerec OÜ, **www.weerec.ee**