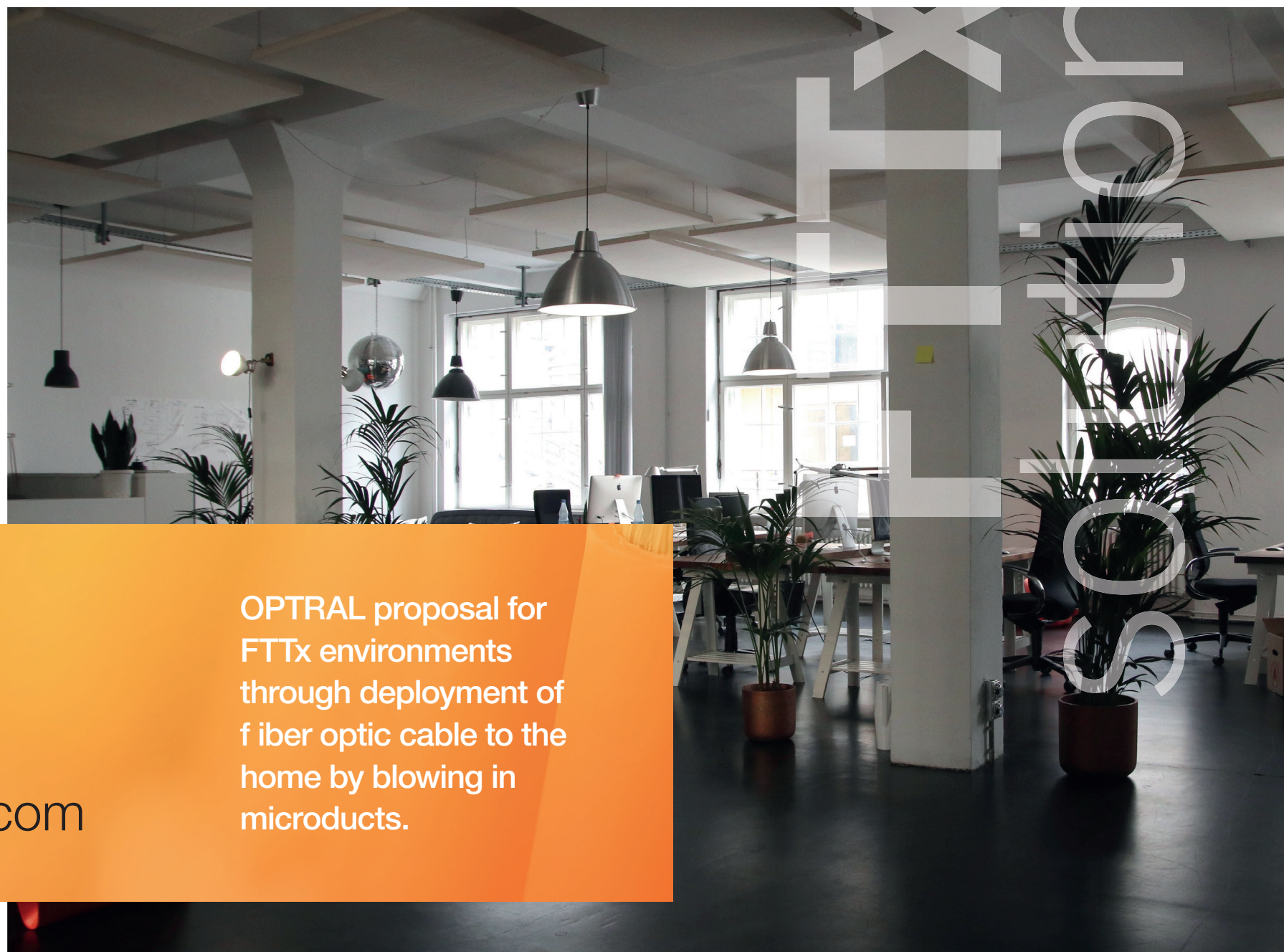




Cables for FTTH

OPTRAL

HIGH PERFORMANCE
OPTICAL CABLES

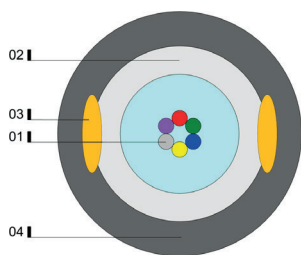
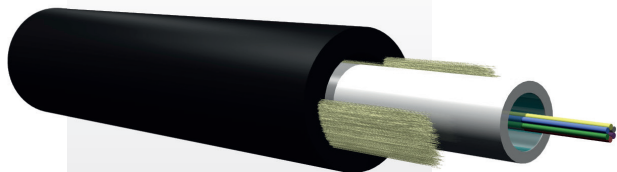


OPTRAL proposal for FTTx environments through deployment of fiber optic cable to the home by blowing in microducts.

optral.com

Cable type: ABD-01

VDE Designation: **A-D (ZN) 2Y (PE jacket)**
A-D (ZN) 4Y (PA12 jacket)



Tested by:
7/10/2014 **VETTER**



MicroJet® PRM 196

OVERALL DIAMETER (mm)

Fiber	Cable Type	OD (mm)	Inner Duct (mm)	Filling ratio (%)
12	Mini ABD-01	2,5	3,5	51
24	Mini ABD-01	3,5	5,5	40
12	ABD-01	3,9	5,5	50
24	ABD-01	4,4	5,5	64

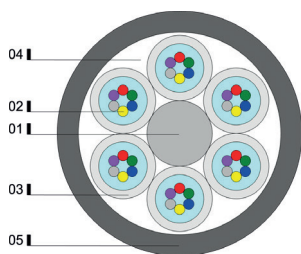
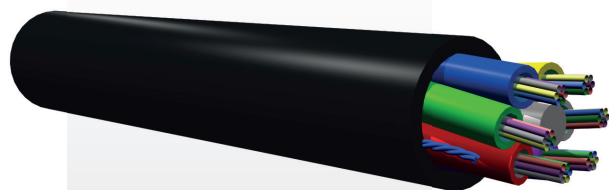
BLOWING PERFORMANCE*

Duct inner diameter	4	mm
Blowing pressure	2,5 - 3	bar
Blowing distance	1250	m
Blowing time	24	min
Blowing time 1.000m	16	min
High blowing speed	78	m/min

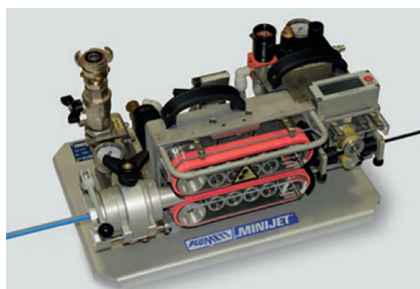
* Cable under test type Mini ABD-01 12F

Cable type: ABD-xx

VDE Designation: **A-D (ZN) 2Y (PE jacket)**
A-D (ZN) 4Y (PA12 jacket)



Tested by:
29/10/2014 **VETTER**



MiniJet® P 2

OVERALL DIAMETER (mm)

Fiber	Cable Type	OD (mm)	Inner Duct (mm)	Filling ratio (%)
24	Mini ABD-06	4,5	5,5	67
48	Mini ABD-06	4,5	5,5	67
72	Mini ABD-06	4,5	5,5	67
96	Mini ABD-08	5,6	8	49
144	Mini ABD-12	7,2	10	52
288	Mini ABD-24	9,3	12	60
24	ABD-06	5,8	8	53
48	ABD-06	5,8	8	53
72	ABD-06	5,8	8	53
96	ABD-08	7,2	10	52
144	ABD-12	8,7	12	53

* Other modularities under request

BLOWING PERFORMANCE*

Duct inner diameter	8	mm
Blowing pressure	2 - 4	bar
Blowing distance	2000	m
Blowing time	35	min
Blowing time 1.000m	10	min
High blowing speed	140	m/min

* Cable under test type ABD-06 72F

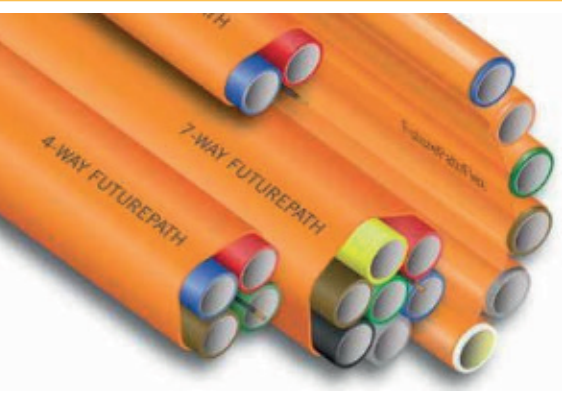
CABLE CONDITIONS & MICRO DUCT RATES

CABLE

DIMENSION STABILITY (COVALITY AND OD SHOULD NOT VARY MORE THAN 0.3MM)	LOW FRICTION JACKET'S MATERIAL WITH NO DEFECTS (COF <=0.1)	MICRO-CABLE MUST BE CLEAN & DRY
GOOD QUALITY CABLE WINDING ON DRUM, WITH NO EVIDENCE OF BUMPS	40% < FILLING RATIO (CABLE VS DUCT) < 65%	CABLE STIFNESS & WEIGHT OPTIMIZED FOR JETTING

THEORETICAL CALCULATED VALUES					PROVED BY PRACTICE (500-1000M ACHIEVED)	
ID Microduct (mm)	OD Microcable IDL (mm)	Filling ratio (%)	OD Microcable MAX (mm)	Filling ratio (%)	OD Microcable RCM (mm)	Filling ratio (%)
3,5	1,8	25	3	75	2,1	36
5,5	2,8	25	4,8	75	3,9	50
8	4	25	6,9	75	6,3	62
10	5	25	8,7	75	7,6	58
12	6	25	10,4	75	9,7	65
14	7	25	12,1	75	10,5	56

ID Inner diameter / OD Overall Diameter / IDL Ideal / MAX Maximum / RCM Recommended



OUR REFERENCES:

TYPE	Tubes/Fiber	O.D. (mm)	Tensile strength Long/Short (N)	Crush Long/Short (N/dm)	Weight (kg/km)
CFO 04-G652D-Mini-ABD-01	01/04	2,5	70/150	100/500	4,8
CFO 08-G652D-Mini-ABD-01	01/08	2,5	70/150	100/500	4,8
CFO 12-G652D-Mini-ABD-01	01/12	2,5	70/150	100/500	4,8
CFO 24-G652D-Mini-ABD-01	01/24	3,5	70/150	100/500	9,4
CFO 04-G652D-ABD-01	01/04	3,9	150/220	700/1200	12
CFO 08-G652D-ABD-01	01/08	3,9	150/220	700/1200	12
CFO 12-G652D-ABD-01	01/12	3,9	150/220	700/1200	12
CFO 24-G652D-ABD-01	01/24	4,4	150/220	700/1200	15
CFO 24-G652D-Mini-ABD-06	02/12	4,5	300/500	150/500	26
CFO 48-G652D-Mini-ABD-06	04/12	4,5	300/500	150/500	26
CFO 72-G652D-Mini-ABD-06	06/12	4,5	300/500	150/500	26
CFO 96-G652D-Mini-ABD-08	08/12	5,6	350/600	150/500	33
CFO 144-G652D-Mini ABD-12	12/12	7,2	350/600	150/500	52
CFO 288-G652D-Mini ABD-24	24/12	9,3	400/800	150/500	80
CFO 24-G652D-ABD-06	02/12	5,8	300/500	175/500	30
CFO 48-G652D-ABD-06	04/12	5,8	300/500	175/500	32
CFO 72-G652D-ABD-06	06/12	5,8	300/500	175/500	33
CFO 96-G652D-ABD-08	08/12	6,4	900/1300	175/500	52
CFO 144-G652D-ABD-12	12/12	8,7	900/1300	175/500	79
CFO 288-G652D-ABD-12	12/24	13,9	300/500	150/500	86



CABLE TEST EQUIPMENT AND FACILITIES

Tested by:
7/10/2014



Vetter GmbH

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D-79807 Lottstetten

FTTx solution

Compresor MK17



OPTRAL

HIGH PERFORMANCE
OPTICAL CABLES

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