# Concentric Core Loose Tube Micro Cable - The Viper Series

GNHL-U-CDGNRV (GNHLDV)  Dielectric 12-432 Fibers G657A1

## Features

- Up to 432 fibers
- Super slim design
- Excellent installation performance
- Unique design with robust inner tubes that does not kink
- Temperature range from -45 to +70°C
- Excellent bend performance, ≥70 mm
- Easy to prepare and identify fibers

## Application

The Hexatronic Viper series of micro cables are characterized by state of the art installation performance when installed by blowing into microducts. Particularly, installations in access networks with difficult routes, which are facilitated by the enhanced performance of the Viper cables.

All parameters such as cable diameter, sheath friction, cable stiffness etc are optimized for best installation performance without compromizing mechanical or environmental properties.

The micro cables are based on a slim loose tube design with up to twelve tubes per cable. The design facilitates fiber preparation and mid-span access. The cables are suitable for long-distance, air blown installation in microducts, with an inner diameter of as little as 8 to 12 mm.

The cables have excellent bend performance and an extremely wide operational temperature range.

## Design

The Micro Cables are designed with one, two or three layers of inner protective tubes made of a unique Poyamide compound. The Polyamide gives a special strength to the product, while increasing the bending properties as well as other benefits such as extreme temperature resistance. Each tube contains 12 or 24 fibers.

As a result, The Viper Micro Cables are more durable during the installation process as they are able to withstand rough handling. The unique cable design with an extended operational temperature range of -45 to +70°C can be used in many environments, on all continents where heat and cold are often a major concern.



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## Typical Data

### Temperature range

Operation .....-45 to +70°C
Storage .....-45 to +70°C
Handling .....-15 to +50°C

### Bending radius

Cable bend radius, permanent, multiple turns
12-72 fiber .....75 mm
96 fiber .....80 mm
144 fiber T24 .....70 mm
144 fiber T12 .....70 mm
192 fiber .....80 mm
288 fiber .....80 mm
432 fiber .....175 mm

### Tensile force

During installation/ operation
12-72 fiber .....1200/50 N
96 fiber .....1200/20 N
144 fiber T24 ..... 1600/75 N
144 fiber T12 .....1000/100 N
192 fiber .....2500/170 N
288 fiber .....3000/100 N
432 fiber .....1800/250 N

### Crush resistance ($\Delta\alpha \leq 0.05$ dB after test, no damage)

12-72 fiber .....2000 N/100 mm
96 fiber .....1000 N/100 mm
144 fiber T24 .....2200N/100 mm
144 fiber T12 .....2000 N/100 mm
192 fiber .....5000 N/100 mm
288 fiber .....2000 N/100 mm
432 fiber .....2000 N/100 mm

### Impact resistance

12-72 fiber .....2 J
96 fiber .....3 J
144 fiber T24 .....5 J
144 fiber T12 .....3 J
192 fiber .....3 J
288 fiber .....3 J
432 fiber .....5 J

### Typical installation performance*

Ducts, inner diameter 8 mm
12- 96 fiber .....2000 m
144 fiber (6x24f) .....2000 m
Ducts, inner diameter 10 mm
12-144 fiber .....2000 m
192 fiber .....1000 m
Ducts, inner diameter 12 mm
12-192 fiber .....2000 m
Ducts, inner diameter 15 mm
288 fiber .....2000 m
432 fiber .....1500 m

* Installation performance verified on Hexatronic test track, according to IEC 60794. Installation performance is affected by the installed path, environmental conditions, installation equipment etc and actual performance may therefore deviate from the above specified values.

## Delivery Information

Supplied lengths .....2, 4, 8 km

The cable is length water blocking according to IEC 60794-1-2-F5B.
Mechanical and environmental test in accordance with IEC 60794-5-10
Fiber parameters and tests according to the IEC series 60793-2 and 60793-1
The cable shall not be stored in direct sun light. The sun may heat up the cable over the permitted temperature limit

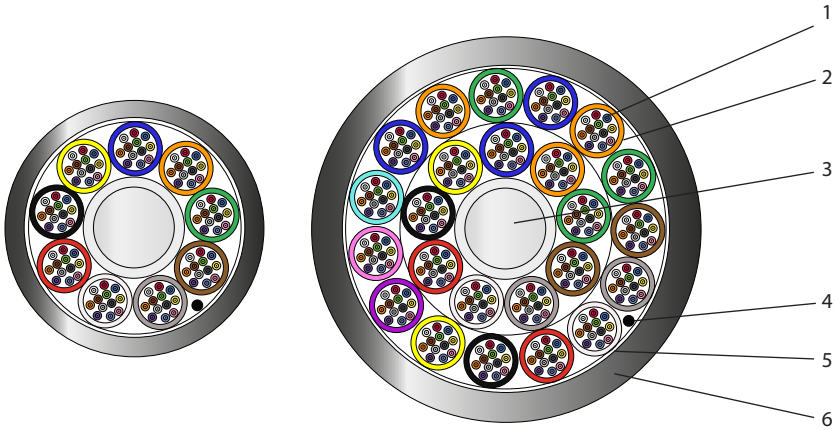
## Color Coding

The cables are available in several versions with different color coding systems: S12, TIA598 (Bellcore), DIN-0888 or FIN2012. Other color code systems are avilable on request.

Black fillers can replace white tubes.

## Design

1. Primary coated fiber..... Silica, acrylate
2. Loose tube ..... PA
3. Central strength member ..... Glass fiber reinforced plastic, PE
4. Slit up yarn..... Aramide yarn
5. Wrapping..... Water blocking yarns
6. Sheath..... Polyethylene, halogen-free




## Transmission Characteristics

| Attenuation | @ 1310nm | @ 1383nm | @ 1550nm |
|---|---|---|---|
| Typical | 0.32dB/km | 0.32dB/km | 0.18dB/km |
| Average in Cable | 0.33dB/km | 0.33dB/km | 0.21dB/km |
| Max | 0.36dB/km | 0.36dB/km | 0.23dB/km |



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## Ordering Information

| | | Tubes/Fibers | | Diameter | Weight | For Microducts ID |
|---|---|---|---|---|---|---|
| **Product No.** | **Product Name** | **No.** | **Color Code** | **ø (mm)** | **kg/km** | **ø (mm)** |
| TOL4019028/12AH | Micro Cable 12f G657A1 S12 | 1x12 (12f) | S12 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019028/24AH | Micro Cable 24f G657A1 S12 | 2x12 (24f) | S12 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019028/48AH | Micro Cable 48f G657A1 S12 | 4x12 (48f) | S12 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019028/72AH | Micro Cable 72f G657A1 S12 | 6x12 (72f) | S12 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019032/96AH | Micro Cable 96f G657A1 S12 | 8x12 (96f) | S12 | 5.9 | 28 | 8 - 10 - 12 |
| TOL4019032/144AH | Micro Cable 144f G657A1 S12 | 6x24 (144f) | S12 | 6.7 | 35 | 8 - 10 - 12 |
| TOL4019053/144AH | Micro Cable 144f G657A1 S12 | 12x12 (144f) | S12 | 7.9 | 35 | 10 - 12 |
| TOL4019028/192AH | Micro Cable 192f G657A1 S12 | 8x24 (192f) | S12 | 7.9 | 47 | 10 - 12 |
| TOL4019039/288AH | Micro Cable 288f G657A1 S12 | 24x12 (288f) | S12 | 10.5 | 83 | ≥ 14 |
| TOL4019028/432AH | Micro Cable 432f G657A1 S12 | 36x12 (432f) | S12 | 11.7 | 98 | ≥ 15 |
| TOL4019022/12C | Micro Cable 12f G657A1 TIA598 | 1x12 (12f) | TIA598 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019022/24C | Micro Cable 24f G657A1 TIA598 | 2x12 (24f) | TIA598 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019022/48C | Micro Cable 48f G657A1 TIA598 | 4x12 (48f) | TIA598 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019022/72C | Micro Cable 72f G657A1 TIA598 | 6x12 (72f) | TIA598 | 5.7 | 28 | 8 - 10 - 12 |
| TOL4019032/96C | Micro Cable 96f G657A1 TIA598 | 8x12 (96f) | TIA598 | 5.9 | 28 | 8 - 10 - 12 |
| TOL4019032/144C | Micro Cable 144f G657A1 TIA598 | 6x24 (144f) | TIA598 | 6.7 | 35 | 8 - 10 - 12 |
| TOL4019053/144C | Micro Cable 144f G657A1 TIA598 | 12x12 (144f) | TIA598 | 7.9 | 35 | 10 - 12 |
| TOL4019022/192C | Micro Cable 192f G657A1 TIA598 | 8x24 (192f) | TIA598 | 7.9 | 47 | 10 - 12 |
| TOL4019039/288C | Micro Cable 288f G657A1 TIA598 | 24x12 (288f) | TIA598 | 10.5 | 83 | ≥ 14 |
| TOL4019028/432C | Micro Cable 432f G657A1 TIA598 | 36x12 (432f) | TIA598 | 11.7 | 98 | ≥ 15 |

## Color Code Systems

| S12 Fibers and Tubes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Red | Blue | White | Green | Yellow | Slate | Brown | Black | Violet | Orange | Aqua | Rose |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | Red — | Blue — | White — | Green — | Yellow — | Slate — | Brown — | Clear — | Violet — | Orange — | Aqua — | Rose — |

| TIA-598 Fibers and Tubes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Blue | Orange | Green | Brown | Slate | White | Red | Black | Yellow | Violet | Rose | Aqua |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | Blue — | Orange — | Green — | Brown — | Slate — | White — | Red — | Clear — | Yellow — | Violet — | Rose — | Aqua — |

The above chart is a quick reference guide for indentification of fibers and tubes in the most common cable designs. For detailed information about the color code systems, please contact Hexatronic.



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