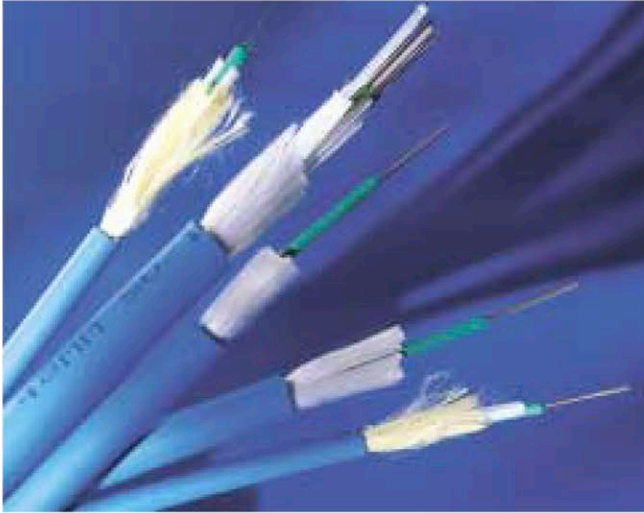




Volition™

Fibre Optic Indoor/Outdoor Cable



Tough enough to take it. Easy to handle.

The Volition™ Network Solutions Indoor/Outdoor Fibre Optic Cable from 3M includes horizontal and backbone cable with either 50/125µm multimode, 62,5/125µm multimode or 9/125µm single mode fibre as part of the system.

The primary application of the cable is for indoor and outdoor installation into cable trays or ducts as LAN cabling. All cable jackets are LSZH (Low Smoke Zero Halogen) rated to fulfil the safety requirements for internal cabling. All cable variants have good resistance against water. The cable core is water blocked using a combination of swellable tape and gel filling inside the tubes. All cables can be installed where there is a risk of having water filled ducts.

Each category of Volition Indoor/Outdoor Cable is available in fibre counts ranging from 2-144 fibres. Additional construction variations are also available on request.

3M Fibre Specification for Indoor/Outdoor Cable

50/125 µm Multimode	Attenuation:	Bandwidth:	Index of Refraction
	≤ 2,7 dB/km @ 850 nm	> 500 MHz-km @ 850 nm	1,482
	≤ 0,8 dB/km @1300 nm	> 800 MHz-km @1300 nm	1,477
62,5/125 µm Multimode	Attenuation:	Bandwidth:	Index of Refraction
	≤ 3,2 dB/km @ 850 nm	> 200 MHz-km @850 nm	1,496
	≤ 1,0 dB/km @1300 nm	> 600 MHz-km @ 1300 nm	1,491
9/125 µm Single mode	Attenuation:	Cut-off Wavelength	Index of Refraction
	≤ 0,40 dB/km @1310 nm	upper limit 1330 nm	1,467
	≤0,25 dB/km @1550 nm	lower limit 1180 nm	1,467

Features

- Small cable diameter
- Produced to industry specifications
- Colour-coded fibres
- Low friction jacket on backbone cables
- Available in multimode or singlemode options
- Designs incorporating glass yarn

Benefits

- Minimizes weight and eases cable installation
Minimizes number and size of conduits
Provides maximum number of cables per conduit
- Ensures system compatibility and interoperability
- Fast and accurate fibre identification
- Easy installation by direct laying or pulling
- Complete range of cables
- Light rodent protection
- Full rodent protection
- Designs incorporating steel armouring

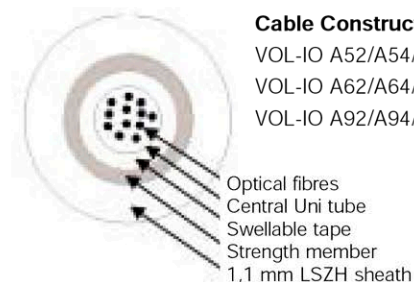
Specifications

Indoor/Outdoor Fibre Cable with aramid yarn for tensile strength

- Cable construction fully dielectric for immunity against lightning
- All tubes containing fibres are gel filled for protection against water
- The cable core is protected against water ingress by a swellable tape
- UV stabilised sheath makes the cable suited for outdoor use
- Fibres are colour coded for fast installation and organisation
- Operation temperature for 2-24 fibre cables:
 - 30°C to 60°C; maximum attenuation variation is 0,5 dB/km (up to the max. specified value)
- Operation temperature for 48 to 144 fibre cables:
 - 40°C to 60°C; maximum attenuation variation is: 0,1 dB/km (up to the max. specified value)
- Meets IEC 60332-1.

Ordering Information:

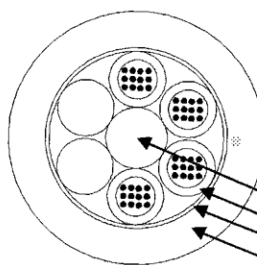
1. Cable can be ordered in lengths between 500m and 2km in increments of 500m.
2. Minimum order quantity for cables with less than 12 fibres is 1km.
3. The colour of multimode cable sheath is blue. Single mode cable sheath is green.
4. One loose tube contains 12 fibres.



Cable Construction 2-24 fibres

VOL-IO A52/A54/A56/A58/A512/A524
VOL-IO A62/A64/A66/A68/A612/A624
VOL-IO A92/A94/A96/A98/A912/A924

Optical fibres
Central Uni tube
Swellable tape
Strength member
1,1 mm LSZH sheath



Cable Construction 48 –144 fibres

VOL-IO A548/A572/A596/A5144
VOL-IO A648/A672/A696/A6144
VOL-IO A948/A972/A996/A9144

Ø 2,5 mm FRP strength member
Ø 2,3 mm loose tubes
Swellable wrapping tape
1,5 mm LSZH sheath

Ordering Information

Ref.-No.

	Bend radius (mm)	Outer dia. (mm)	Weight (kg/km)	Max. short term load (N)	Fire loading (MJ/m)		
						OM2	OM3
Multimode Cable 50/125µm							
2 fibre Unitube, gel filled w/aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA52	VOL-IOA52MC
4 fibre Unitube, gel filled w/aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA54	VOL-IOA54MC
6 fibre Unitube, gel filled w/aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA56	VOL-IOA56MC
8 fibre Unitube, gel filled w/aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA58	VOL-IOA58MC
12 fibre Unitube, gel filled w/aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA512	VOL-IOA512MC
24 fibre Unitube, gel filled w/aramid yarn LSZH	100	8	35	1000	1,5	VOL-IOA524	VOL-IOA524MC
48 fibre Loose tube, gel filled w/ FRP* LSZH	210	10,5	90	1800	2,3	VOL-IOA548	VOL-IOA548MC
72 fibre Loose tube, gel filled w/ FRP* LSZH	210	10,5	90	1800	2,2	VOL-IOA572	VOL-IOA572MC
96 fibre Loose tube, gel filled w/ FRP* LSZH	240	12	150	1800	2,9	VOL-IOA596	VOL-IOA596MC
144 fibre Loose tube, gel filled w/ FRP* LSZH	300	15	220	1800	4,7	VOL-IOA5144	VOL-IOA5144MC
						OM1	
Multimode Cable 62,5/125µm							
2 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA62	
4 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA64	
6 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA66	
8 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA68	
12 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA612	
24 fibre Unitube, gel filled w/ aramid yarn LSZH	100	8	35	1000	1,5	VOL-IOA624	
48 fibre Loose tube, gel filled w/ FRP* LSZH	210	10,5	90	1800	2,3	VOL-IOA648	
72 fibre Loose tube, gel filled w/ FRP* LSZH	210	10,5	90	1800	2,2	VOL-IOA672	
96 fibre Loose tube, gel filled w/ FRP* LSZH	240	12	150	1800	2,9	VOL-IOA696	
144 fibre Loose tube, gel filled w/ FRP* LSZH	300	15	220	1800	4,7	VOL-IOA6144	
Single mode Cable 9/125µm							
2 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA92	
4 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA94	
6 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA96	
8 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA98	
12 fibre Unitube, gel filled w/ aramid yarn LSZH	100	7	30	1000	1,3	VOL-IOA912	
24 fibre Unitube, gel filled w/ aramid yarn LSZH	100	8	35	1000	1,5	VOL-IOA924	
48 fibre Loose tube, gel filled w/ FRP* LSZH	210	10,5	90	1800	2,3	VOL-IOA948	
72 fibre Loose tube, gel filled w/ FRP* LSZH	210	10,5	90	1800	2,2	VOL-IOA972	
96 fibre Loose tube, gel filled w/ FRP* LSZH	240	12	150	1800	2,9	VOL-IOA996	
144 fibre Loose tube, gel filled w/ FRP* LSZH	300	15	220	1800	4,7	VOL-IOA9144	

* Cables with 48 to 144 fibres have a non-metallic central strength member.

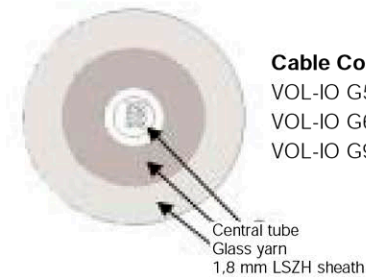
Specifications

Indoor/Outdoor Fibre Cable with glass yarn for tensile strength and rodent protection

- Glass yarn acts as rodent protection, effective in most cases
- Cable construction fully dielectric for immunity against lightning
- All tubes containing fibres are gel filled for protection against water
- The cable core is protected against water ingress by a swellable tape
- UV stabilised sheath makes the cable suited for outdoor use
- Fibres are colour coded for fast installation and organisation
- Operation temperature for all fibre cables:
-40°C to 60°C; maximum attenuation variation is 0,1 dB/km (up to the max. specified value)
- Meets IEC 60332-1.

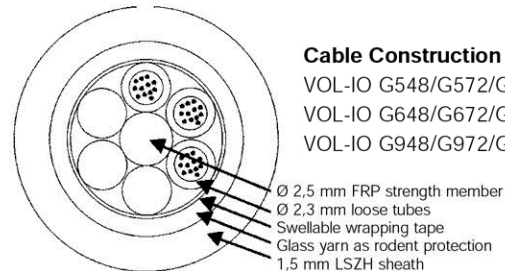
Ordering Information:

1. Cable can be ordered in lengths between 500m and 2km in increments of 500m.
2. Minimum order quantity for cables with less than 12 fibres is 1km.
3. The colour of multimode cable sheath is blue. Single mode cable sheath is green.
4. One loose tube contains 12 Fibres.



Cable Construction 2-24 fibres

VOL-IO G52/G54//G56/G58/G512/G524
VOL-IO G62/G64/G66/G68/G612/G624
VOL-IO G92/G94/G96/G98/G912/G924



Cable Construction 48 -744 fibres

VOL-IO G548/G572/G596/G5144
VOL-IO G648/G672/G696/G6144
VOL-IO G948/G972/G996/G9144

Ordering Information

Ref.-No.

	Bend radius (mm)	Outer dia. (mm)	Weight (kg/km)	Max. short term load (N)	Fire loading (MJ/m)		
Multimode Cable 50/125µm						OM 2	OM3
2 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG52	VOL-IOG52MC
4 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG54	VOL-IOG54MC
6 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG56	VOL-IOG56MC
8 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG58	VOL-IOG58MC
12 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG512	VOL-IOG512MC
24 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	145	3000	2,3	VOL-IOG524	VOL-IOG524MC
48 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	300	13,5	230	8000	2,8	VOL-IOG548	VOL-IOG548MC
72 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	300	13,5	230	8000	2,7	VOL-IOG572	VOL-IOG572MC
96 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	330	15	235	8000	3,9	VOL-IOG596	VOL-IOG596MC
144 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	400	18	320	8000	5,8	VOL-IOG5144	VOL-IOG5144MC
Multimode Cable 62,5/125µm						OM 1	
2 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG62	
4 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	2000	2,0	VOL-IOG64	
6 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	2000	2,0	VOL-IOG66	
8 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	2000	2,0	VOL-IOG68	
12 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG612	
24 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	145	3000	2,3	VOL-IOG624	
48 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	300	13,5	230	8000	2,8	VOL-IOG648	
72 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	300	13,5	230	8000	2,7	VOL-IOG672	
96 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	330	15	235	8000	3,9	VOL-IOG696	
144 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	400	18	320	8000	5,8	VOL-IOG6144	
Single mode Cable 9/125µm							
2 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	2000	2,0	VOL-IOG92	
4 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	2000	2,0	VOL-IOG94	
6 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	2000	2,0	VOL-IOG96	
8 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	2000	2,0	VOL-IOG98	
12 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	140	3000	2,0	VOL-IOG912	
24 fibre Unitube, gel filled w/ glass yarn LSZH	100	11	145	3000	2,3	VOL-IOG924	
48 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	300	13,5	230	8000	2,8	VOL-IOG948	
72 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	300	13,5	230	8000	2,7	VOL-IOG972	
96 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	330	15	235	8000	3,9	VOL-IOG996	
72 fibre Loose tube, gel filled w/ FRP* LSZH and glass yarn	400	18	320	8000	5,8	VOL-IOG9144	

* Cables with 48 to 144 fibres have a non-metallic central strength member.

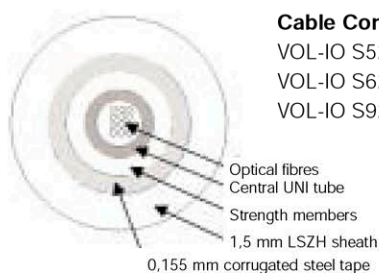
Specifications

Indoor/Outdoor Fibre Cable with corrugated steel tape armouring for rodent protection

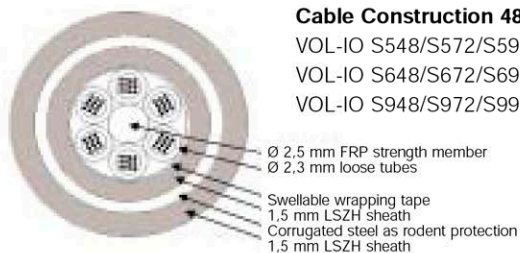
- Corrugated steel tape armouring for added robustness and safe rodent protection in harsh environments
- For direct burial under difficult laying conditions (48 to 144 fibre cables)
- All tubes containing fibres are gel filled for protection against water
- The cable core is protected against water ingress by a swellable tape
- UV stabilised sheath makes the cable suited for outdoor use
- Fibres are colour coded for fast installation and organisation
- Operation temperature for all fibre cables:
-40°C to 60°C; maximum attenuation variation is 0,1 dB/km (up to the max. specified value)
- Meets IEC 60332-1.

Ordering Information:

1. Cable can be ordered in lengths between 500m and 2km in increments of 500m.
2. Minimum order quantity for cables with less than 12 fibres is 1km.
3. The colour of multimode cable sheath is blue. Single mode cable sheath is green.
4. One loose tube contains 12 fibres.



Cable Construction 2-24 fibres
VOL-IO S52/S54/S56/S58/S512/S524
VOL-IO S62/S64/S66/S68/S612/S624
VOL-IO S92/S94/S96/S98/S912/S924



Cable Construction 48 -144 fibres
VOL-IO S548/S572/S596/S5144
VOL-IO S648/S672/S696/S6144
VOL-IO S948/S972/S996/S9144

Ordering Information

Ref.-No.

	Bend radius (mm)	Outer dia. (mm)	Weight (kg/km)	Max. short term load (N)	Fire loading (MJ/m)		
Multimode Cable 50/125µm						OM 2	OM 3
2 fibre Unitube, gel filled w/aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS52	VOL-IOS52MC
4 fibre Unitube, gel filled w/aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS54	VOL-IOS54MC
6 fibre Unitube, gel filled w/aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS56	VOL-IOS56MC
8 fibre Unitube, gel filled w/aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS58	VOL-IOS58MC
12 fibre Unitube, gel filled w/aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS512	VOL-IOS512MC
24 fibre Unitube, gel filled w/aramid yarn and corrugated steel LSZH	55	9,5	85	1000	1,6	VOL-IOS524	VOL-IOS524MC
48 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	290	14,5	285	1800	4,5	VOL-IOS548	VOL-IOS548MC
72 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	290	14,5	285	1800	4,4	VOL-IOS572	VOL-IOS572MC
96 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	330	16,5	395	1800	4,6	VOL-IOS596	VOL-IOS596MC
144 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	450	22,5	560	300	8,9	VOL-IOS5144	VOL-IOS5144MC

	Bend radius (mm)	Outer dia. (mm)	Weight (kg/km)	Max. short term load (N)	Fire loading (MJ/m)	
Multimode Cable 62,5/125µm						OM 1
2 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS62
4 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS64
6 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS66
8 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS68
12 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS612
24 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	9,5	85	1000	1,6	VOL-IOS624
48 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	290	14,5	285	1800	4,5	VOL-IOS648
72 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	290	14,5	285	1800	4,4	VOL-IOS672
96 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	330	16,5	395	1800	4,6	VOL-IOS696
144 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	450	22,5	560	3000	8,9	VOL-IOS6144
Singlemode Cable 9/125µm						
2 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS9
4 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS94
6 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS96
8 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS98
12 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	8,5	75	1000	1,7	VOL-IOS912
24 fibre Unitube, gel filled w/ aramid yarn and corrugated steel LSZH	55	9,5	85	1000	1,6	VOL-IOS924
48 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	290	14,5	285	1800	4,5	VOL-IOS948
72 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	290	14,5	285	1800	4,4	VOL-IOS972
96 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	330	16,5	395	1800	4,6	VOL-IOS996
144 fibre Loose tube, gel filled w/ FRP* and corrugated steel LSZH	450	22,5	560	3000	8,9	VOL-IOS972

* Cables with 48 to 144 fibres have a non-metallic central strength member.

Specifications

3M Fibre Performance for Ethernet Applications

Optical Fibre Specification	Core diameter (μm)	Overfilled Launch Bandwidth (LED) MHz x km		Effective Laser Launch Bandwidth
		850nm	1300nm	MHz x km
				850nm
OM1	62,5	200	600	Not Specified
OM2	50,0	500	800	Not Specified
OM3	50,0	1500	500	2000

Optical Fibre Specification	Fast Ethernet		Gigabit Ethernet		10 Gigabit Ethernet
	Link Distance (m) 100 Base		Link Distance (m) 1000 Base		Link Distance (m) 10 Gbase-SR
	850nm	1300nm	850nm	1300nm	850nm
	LED (SX)	LED (LX)	Laser (SX)	Laser (LX)	Serial Laser (SR)
OM1	300	2000	275	550	33
OM2	300	2000	550	550	82
OM3	300	2000	550	550	300

Colour coding of the fibres

Fibre number	Fibre colour	Fibre number	Fibre colour
1	Red	13	Yellow + marker
2	Green	14	White + marker
3	Blue	15	Grey + marker
3	Yellow	16	Turquoise + marker
5	White	17	Orange + marker
6	Grey	18	Pink + marker
7	Brown	19	Yellow + marker*
8	Violet	20	White + marker*
9	Turquoise	21	Grey + marker*
10	Black	22	Turquoise + marker*
11	Orange	23	Orange + marker*
12	Pink	24	Pink + marker*

Where marker is spaced at 70mm intervals and marker* is spaced at 35mm intervals.

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