

## Development of a Resin Extrusion-Molding Type Cable Guide

### 1. INTRODUCTION

A guide support device, which moves to defined position while storing and protecting cables to prevent damage or breaks caused by cables entwining each other or cables rampaging when the cables are used in moving parts of industrial machines, equipments and others move to defined position following the movement of the equipments, is a cable carrier.

For industrial robots and facilities related to liquid crystal and semiconductors, there are growing needs for reliability, increase of speed, guarantee of cleanliness, quietness and space-saving more than before. In response to such needs, the parts for the cable carrier are required to be lighter weight, generating less dust and lower noise.

Okano Cable Co., Ltd. has developed and commercialized the new conceptual cable carrier "Cable Guide" which meets these needs and is pleased to introduce it.



Figure 1 External view of the cable guide body.

### 2. FEATURES OF THE PRODUCT

The features of this product are as follows.

#### 2.1. Light Weight

The product is approx. 40% lighter in weight compared to general and conventional cable carriers.

It has impacts with respect to the reductions in the load of the motor in moving parts and in power consumption.

#### 2.2. Low Sound Noise

The cable guide is a monolithic molding produced by resin extrusion-molding and has no mechanical parts, therefore its operation is very quiet. The noise while it is operating is up to 35 dB. (The noise with general products is approx. 66 dB.)

#### 2.3. Less Dust Generation

The cable guide is a monolithic molding produced by resin extrusion-molding and has no mechanical parts, therefore it generates almost no dust.

#### 2.4. Easy Handling

It is easy to handle in installation or replacement of cables.

### 3. STRUCTURE

The product is a monolithic molding produced by resin extrusion-molding. To achieve smooth bending motion, it has slits on the sidewall and v-shaped notches at the bottom. It has no mechanical parts, therefore its structure features a light weight, a low noise, a less dust generation and also a remarkable durability.

Three sizes, small, medium and large (with guide widths between 30 and 75 mm), of the cable guides are available in the product lineup to suit a wide variety of needs.

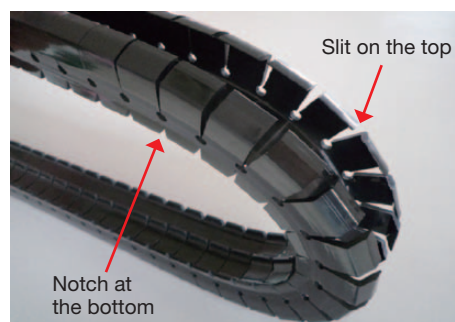


Figure 2 General view of the cable guide.

### 4. SYSTEM CONFIGURATION

Examples of the cross-section views of the monolithic molding sections produced by resin extrusion-molding are shown in figure 3 (without notches and slits).

An example of the configuration drawing of the cable guide, guide clamps and cable holding parts at the ends, cables and end connectors is shown in Figure 4.

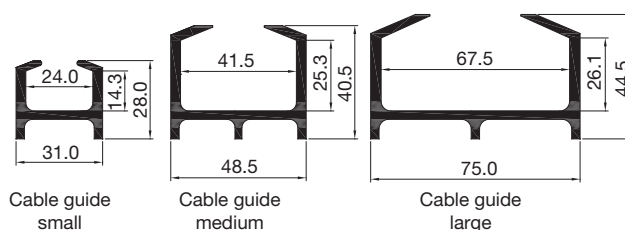


Figure 3 Cross-section structure of the cable guide.

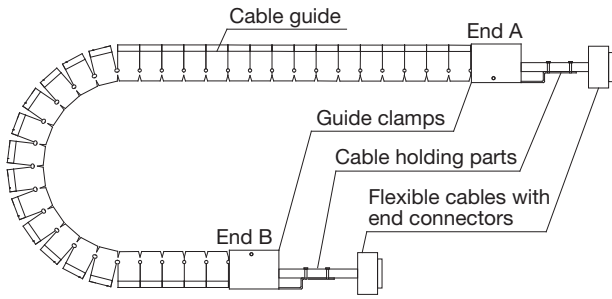


Figure 4 Configuration drawing of the cable guide.

We provide complete systems of the products where systems are not only including cable guides but also flexible cables and end connectors installed in the cable guides.

An example of the system application (electric power supply and control to a servomotor of a single-axis robot) is shown in Figure 5.

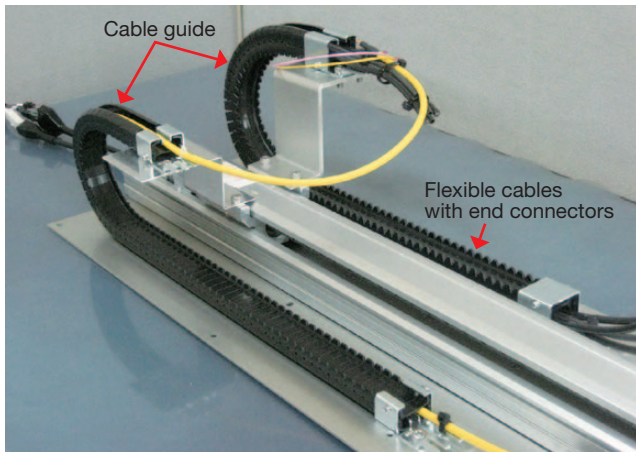


Figure 5 Example of the system application.

### 5. THE KEY SPECIFICATIONS

The key specifications are shown in Table 1.

Table 1 Specifications of this product.

Items	Specifications		
	Guide large	Guide medium	Guide small
Applicable place	Indoor use		
Operating temperature range (°C)	- 20 to 80		
Operating humidity range (RH %)	35 - 95		
Maximum Operating stroke (m)	2.2	2.2	2.0
Minimum bending radius R (mm)	100	80	80
Cable guide weight (kg/m)	0.69	0.50	0.31
Maximum operating speed (m/sec)	2.0		
Applicable maximum cable weight (kg/m)	1.1	0.75	0.25

Note: Applicable environmental Condition: No continuous immersion of the water and no condensation. Alkaline fluid and acid fluid are inapplicable, hydrogen peroxide water is inapplicable.

The performance diagram of the cable guide (relations between weight of installed cable and moving stroke) is shown in Figure 6.

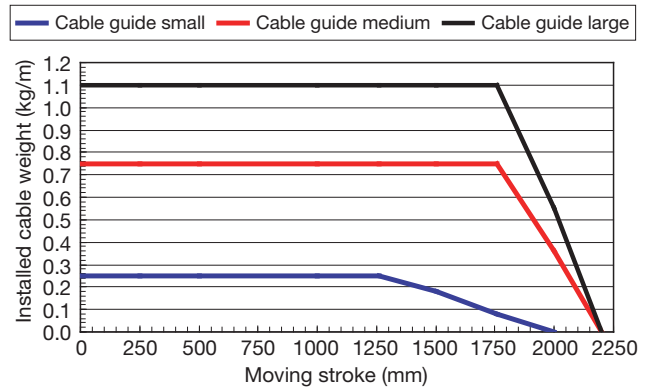


Figure 6 The performance diagram of the cable guide.

### 6. CONCLUSION

We, Okano Cable Co., Ltd., have been providing reliable robot cable to the various fields based on extensive experiences and knowhow. We have developed the cable guide from viewpoints of a self- support of robot cables, so that the cable guide, which is a monolithic molding produced by resin extrusion-molding, has superior performances with lighter weight, lower noise and less dust generation.

This product received great feedback from the customers/visitors on the news release and at various exhibitions in October, last year. We will expand its application to industrial robots and various equipments.

We also provide complete systems of the products offering not only this cable guide but also robot cables installed in this product to meet the requirements of the customers.

This product was commercialized since October, 2012.

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