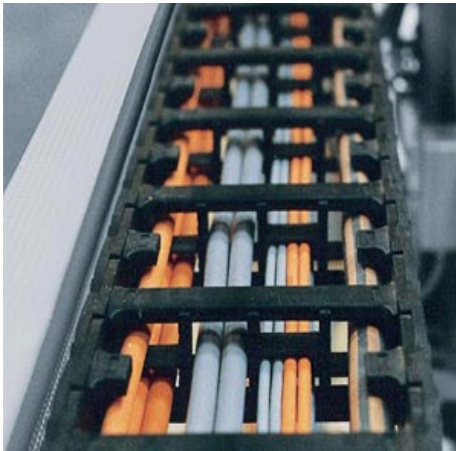


# TECHTALK DESIGN ADVICE SERIES

## THE CABLE DISTRIBUTION RULES YOU NEED TO OBEY



The key advantage of a cable carrier is that bus and motor cables, pneumatics, electrics and hydraulics can all be guided safely in one system. However, correctly arranging each cable and hose within your chosen cable carrier according to the recommended spacing requirements is vital if you want to prolong the service life of your system.

Although we would welcome the opportunity to recommend the optimal separation layout for your cables or hoses (call us anytime at 1 800-521-2747 or e-mail [techupdates@igus.com](mailto:techupdates@igus.com)), as the customer it's still you who makes the final decision.

For this reason, I wanted to explain in more detail the essential distribution rules to consider when organizing your cable and hose packages.

### Why use interior separation in the first place?

Interior separation is crucial in order to extend the service life of cables and hoses in your application.

Cables and hoses with different diameters and outer jacket materials need to be laid out separately using modular separators. A minimum clearance between cables, hoses and the cable carrier should also be maintained. (The maximum outside diameter we give for each cable series corresponds directly to this - ask us if you're unsure.)



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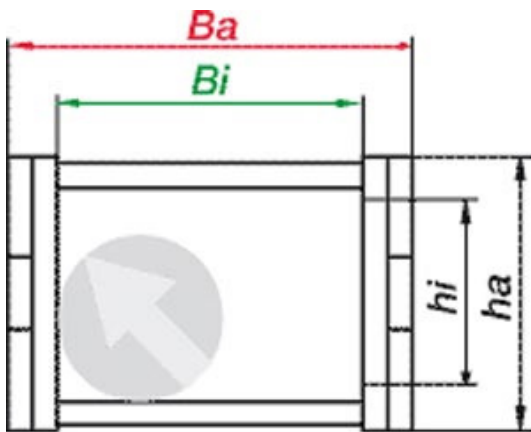
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Moreover, the faster and more frequently a cable carrier moves back and forth, the more important the exact positioning of the cables and hoses inside is.

Cramming in as many cables as possible into a cable carrier simply won't work. Cables can become permanently deformed - 'corkscrew' - or become tangled up with one another. If cables with different outer jacket materials—for example PVC and PUR—are placed side by side, then these can wear against each other and become 'stuck' together. All these scenarios can lead to premature failure.

## Two essential rules

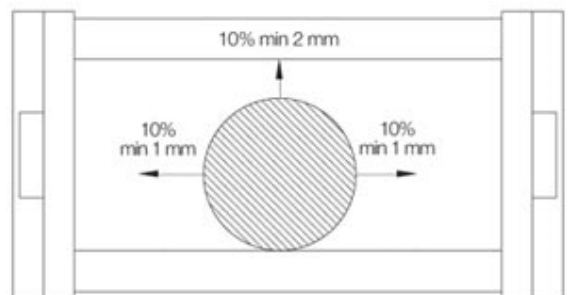
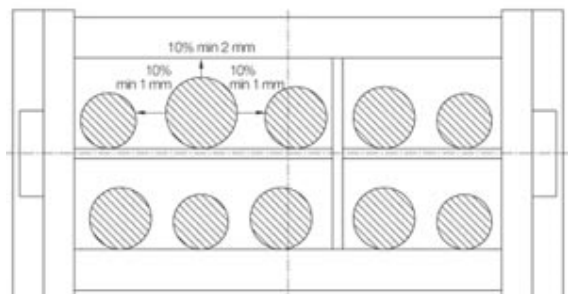
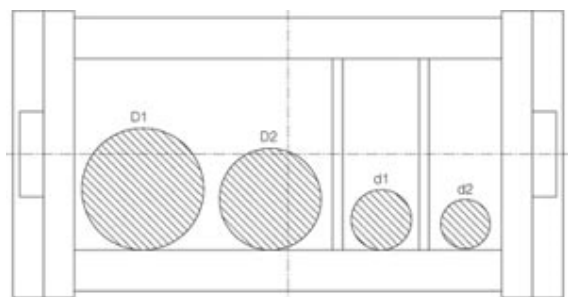
There are two key rules of distribution that should always be followed, so that cables and hoses can move freely at all times with no tensile force exerted at the radius of the cable carrier:

### Rule 1: $D1 + D2 > 1.2 \times hi$

If  $D1 + D2 > 1.2 \times$  chain inner height, no separation between the two cables/hoses is necessary. Two cables or hoses should never be left unguided on top of one another or be allowed to become tangled.

### Rule 2: $d1 + d2 \leq 1.2 \times hi$

If  $d1 + d2 \leq 1.2 \times$  chain inner height, a vertical separator or a horizontal shelf must be used to reduce the inner height, thereby preventing the entanglement of  $d1$  and  $d2$ .



## Further guidelines for distribution:

1. The cumulative weight of the cables and hoses should be evenly distributed across the width of the chain.
2. No more than two cables or hoses should be installed on top of one another.
3. Cables and hoses should always be strain relieved at the moving end and, whenever possible, at both ends. The exception is that hydraulic hoses should only be strain relieved at the moving end.

4. For high-speed applications and high cycles, cables or hoses must not be laid on top of each other without horizontal separation.

Note: The standard values for this are: travel speed over 1.64 ft/s and cycles over 10,000 p.a. igus® interior separation offers a safe solution for this situation. There are, of course, exceptions to every rule, which is when our technical specialists come in. They can help you ensure your system will operate properly, with the maximum service life for your application.

## **The Energy Chain® Configurator tool**

The Energy Chain® Configurator program allows you to quickly custom build a cable carrier online with any of the cables and internal separators we offer from stock.

You can then generate CAD files and a parts list, or submit a quote request directly to us.

Interior separators, shelves, cables and hoses can be installed virtually in just a few clicks and a complete Energy Chain System® can be configured in just minutes.

The cable carrier configurator is designed to be as simple as possible. An integrated control device forbids component parts to be dragged into the chain link anywhere they will not work, for example. This avoids the potential for error.

A step-by-step guide to using the Configurator is available online by clicking [here](#). Our technical team is always on hand to optimize the configuration you generate, if required.

## **What if I just don't have the time?**

The configurator is just one tool igus® offers to help make it easier for you to work with our products. However, we know your time is valuable.

For this reason I'd like to urge you to remember that igus® offers free consultation (1 800-521-2747 or [sales@igus.com](mailto:sales@igus.com)) from 8:00AM EST to 5:00PM PST, Monday through Friday.

## **Useful Links**

[Learn more: Energy Chain® cable carriers](#)

[Energy Chain® Product Finder](#)

[Request catalog or sample](#)

[Configurator Program](#)