TECHTALK DESIGN ADVICE SERIES

GLIDING, LONG TRAVEL CABLE CARRIER APPLICATIONS

Long travel applications

Cable carriers guide and protect moving cables and hoses at low to high speeds, over long and short distances, in all axes, and in a wide range of different applications all over the world.

Over the years, cable carrier manufacturers have increasingly pushed the envelope in terms of higher speeds, longer distances and heavier loads. Cable carriers are an extremely low maintenance solution and can withstand extreme conditions, such as low or high temperatures, harsh weather conditions, sea water, chemical exposure, and more.

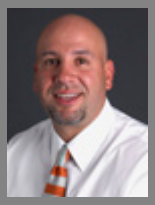
Cable carriers offer a longer service life and increased system reliability due to superior technology in comparison to cable reels or festoons, for example. They also save on installation space and can reduce the length of cable required by more than 50%. No additional drives or control systems are required.

10 advantages for long travel applications with cable carriers

There are 10 key ways in which cable carriers can benefit your long travel application:

1. Travels over 1,312 ft possible (igus® Rol-E-Chain)
2. Gliding speeds up to 16.4 ft/s
3. Service life of 10 years and more

YOUR CONTACT



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4. Many different types of cables and hoses can operate side by side in the same system
5. Space-saving installation
6. Quiet operation
7. High accelerations
8. Durable despite wind, weather, dirt, and chemical exposure
9. Modular system is easy to assemble
10. Cables and hoses can be rapidly retrofitted

The gliding principle

This principle comes into play whenever a long travel application is involved. This is because, for long travels, the upper run of the cable carrier nests on the lower run. The upper run glides partially on the lower run and partially at the same height on a glide bar.

The illustrations below show the gliding application principle. For lateral guidance, a guide trough is necessary. If the stationary mounting bracket and the fixed end of the cables and hoses can be placed in the center, the cable carrier length is calculated as follows:

Cable carrier length:

Lk = S/2 + K

S = length of travel

R = Bending radius

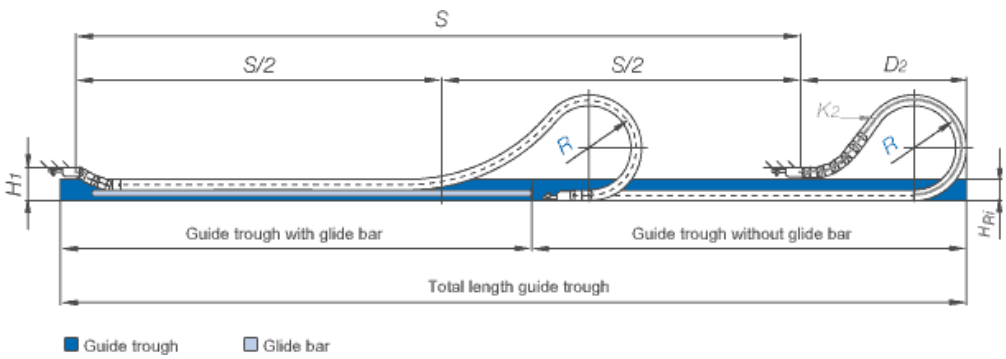
HRi = Trough inner height

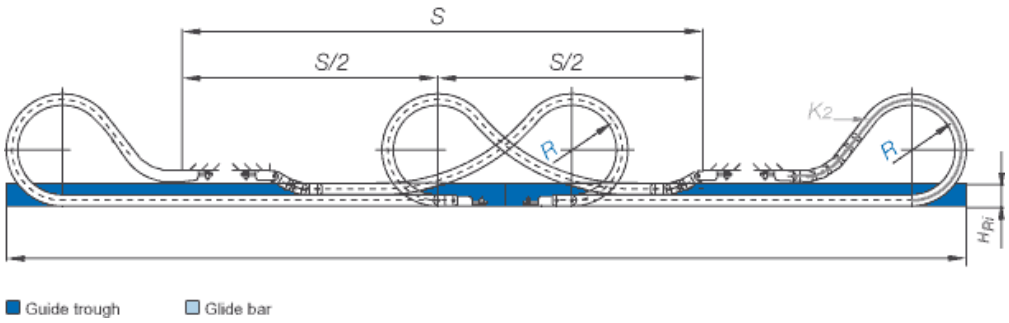
HF = Required clearance height

K2 = Further add-on if the mounting bracket location is set lower

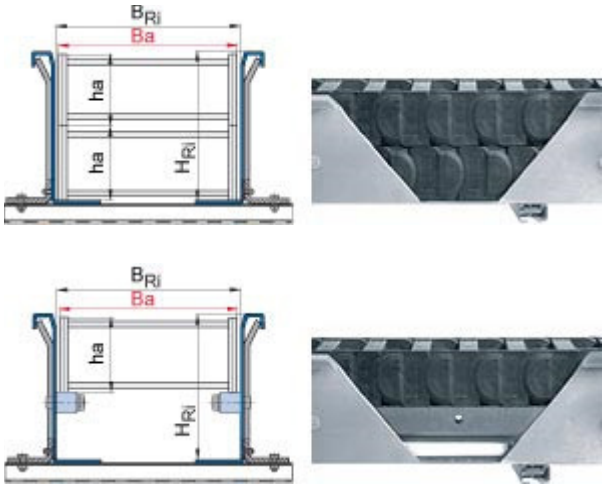
K = Pi R + "safety" - add-on for bending radius (K is taken from the data tables of the individual igus® Series)

D2 = Over length for long travels, gliding





Guide troughs



A guide trough is an important element in long travel applications. The height of the trough must be at least twice the total chain link height and the sides should provide a chamfered opening. When the upper run cannot glide on the lower run, glide bars must be installed along the sides of the trough.

igus® recommends the use of polymer glide bars, because they are optimally matched to its cable carrier material and achieve the lowest values in terms of friction, noise and wear.

Important: When assembling the trough parts, the following points must be given particular attention:

11. Properly align all trough parts upon installation
12. All screw heads should be flush with the trough
13. Smooth leveled transition between the end of the chain and the glide bars
14. Solid connection with the glide surface

Travel speeds and accelerations

Travel speeds up to 16.4 ft/s in continuous operation are possible and exist on current applications. In special cases, even higher speeds are possible.

For example, igus® E4/100 and E4/4 Energy Chains® achieve speeds of 72 ft/s and accelerations of 2,572 ft/s in crash test units.

Acceleration plays a large role in the calculation. Differentiations must be made between normal operational acceleration and a sudden jolt of acceleration, such as unexpected stops.

Service life

Cable carriers with 656 ft travels have been in operation for 8 years with minimum maintenance*. Cable carriers travelling up to 197 ft have been in operation for 12 years with almost no maintenance*.

*Source: igus test laboratory

Technical environment

Long travel applications can run in water, in dirt, in the tropics, in explosion risk areas (if they have certain special design features, such as material suitable for electrostatic-discharge applications) and many other conditions.

Guide troughs are also available in corrosion-free materials.

Test results

igus® uses tests to determine:

- push-pull forces under both ambient and extreme temperatures, humidity, and dirt;
- cable carrier friction values, alone and against various glide services;
- behavior of electrical cables under push-pull conditions;
- behavior of hydraulic and media hoses under push-pull conditions;
- service life, and noise generation.

Before choosing to work with a cable carrier supplier, decide if some or all of these points are applicable to your application and gather the related test data to compare before you move ahead with procurement.

Useful Links
Learn more: Energy Chain® cable carriers

Energy Chain® Product Finder