



Cable ties with a snug fit around the cable.

Cables can be moved within the cable tie.

Cable ties are uniformly placed.

Maintain 25 lbs tensile force on each cable.

Pulling and Supporting Cables

The following is a compilation of industry standards and best practices with respect to pulling and supporting cabling.

When pulling cable, tension must be applied to all elements of the cable in an even fashion without violating the maximum pull tension of the cable. If the pull tension is exceeded and just the sheath is pulled, it may tear and pull away from the core. If the core is pulled too rigorously, it may be pulled out from the sheath. Extreme care needs to be taken to pull the cable from the box or reel evenly to avoid problems.

Problems can also occur from the following situations and thus should be avoided:

- » Pulling cables over or around obstacles
- » Pulling cables around corners
- » Pulling too long of a run
- » Pulling cable through a conduit too small for the amount of cable

The maximum allowable pull tension of a cable is the greatest pulling force that can be applied without causing damage. For 4-pair UTP cable, the maximum pull tension is 25 pounds of force.

The pull tension for coaxial cable is shown in the table below. Note the difference between solid copper center conductor and copper coated steel. The common cable used for RF distribution is an RG6 quad shield with a copper coated steel. This is due to the skin effect which states that at high frequencies electrons will travel closer to the surface. The steel is used because it is less expensive and adds strength to the pull tension of the cable.

Pull Tension for Coaxial Cable

Center Conductor	Series 6	Series 11
Copper Coated Steel	75 lbs (34 Kg)	150 lbs (68 Kg)
Copper	40 lbs (18 Kg)	80 lbs (36 Kg)

Supporting Cables

What happens when the maximum pull tension is exceeded? Excessive tensile load or tensile force (pull tension) on a cable will diminish its capability. In simpler terms, the more a cable is damaged as a result of bending or excessive tension, the less bandwidth it will be capable of carrying in comparison to a perfectly straight, pristine piece of cable of the same length. For this reason care must be taken when securing UTP and coaxial cables. Use the following good practices when fastening cables for support.

- » Vertical cables must be able to support their own weight. To accomplish this, they must be secured at regular intervals.
- » Cable ties, straps, clamps and other devices should be installed so the cable is supported, yet is able to move within the fastening hardware.
- » Cables should not be misshapen or bent by the fastening hardware, since tightly bundling cables will severely impact the high-frequency information.

This article is an excerpt from *Residential Integrator's Design Secrets*, found at www.dipartner.com

Copyright ©2008 by Dpartner. No part of this article may be reproduced, stored in a retrieval system, or transmitted in any form, or by any means, electronic, mechanical, photocopying, recording, scanning, or otherwise, except as permitted under Section 107 or 108 of the 1976 United States Copyright Act, without prior written permission of Dpartner. Trademarked names may appear in this book. Rather than use a trademark symbol with every occurrence of the trademarked name, we use the name only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark. The information in this article is distributed on an "as is" basis, without warranty. Although every precaution has been taken in the preparation of this work, neither the authors nor Dpartner shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this article.



PARTNER

www.Dipartner.com