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High-Power, Low-Force (HPLF) Connectors



DCX-CHOL new family of high-power, low-force (HPLF) connectors utilizes MIL-C-38999, series III shell styles, and proprietary layouts to lend a new dimension to reliable high-power transmission for many applications. Patented HPLF power contacts can now be installed in slightly modified versions of MIL-C-38999, series III connectors, or other connector styles as required.

Contacts that accommodate wire sizes from 20 AWG to 4/0 can now be incorporated into these reliable connectors. The socket contact design incorporates independent gold plated copper wire conductors that are typically woven with a Kevlar fiber. This flexible fiber is under tension to provide a low normal force between the socket and its mating pin contact. The resultant is a contact that can provide hundreds of contact points.

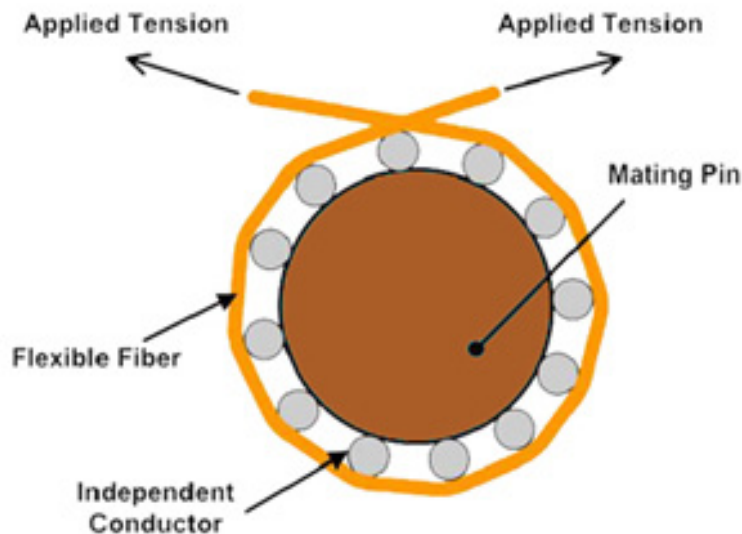
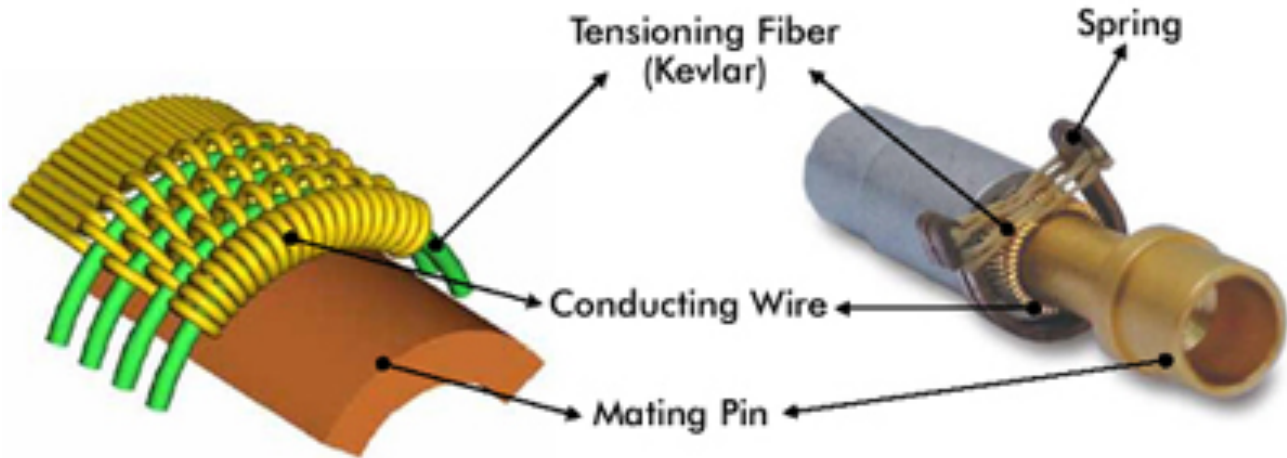
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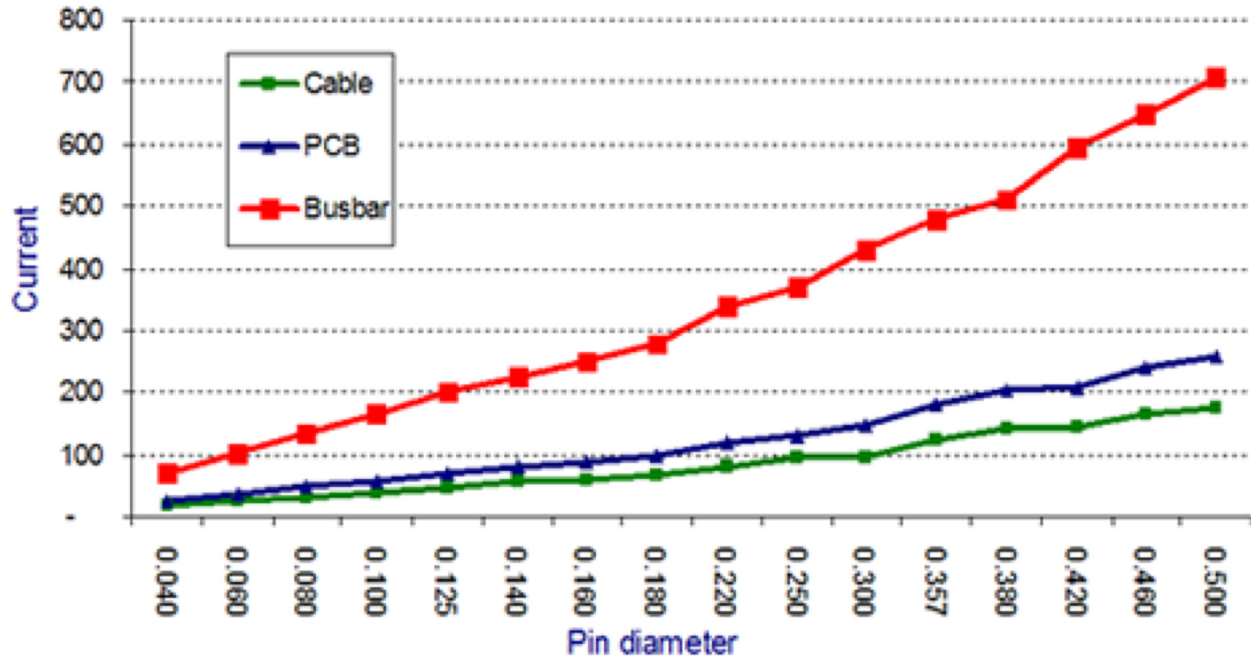
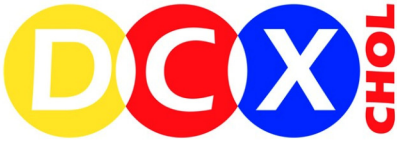
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This design dramatically reduces the electrical resistance across a pair of mated contacts. In fact, the use of high conductivity copper wires instead of conventional spring copper alloys enhances this performance. Due to this improvement, the current carrying capacity of the contacts is significantly enhanced.

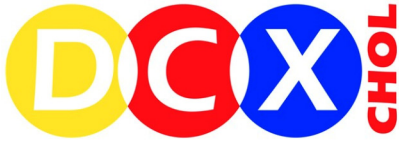


As can be seen from the chart above, a wired M39029 type contact (as used on standard MIL-C-38999, series III connectors) is considerably de-rated with respect to the equivalent gauge wire. A size 16 contact is rated at 13 amps (source: Amphenol connectors) while the equivalent size wire (16 AWG) is rated at 32 amps (source: Standard Wire and Cable). With the DCX-CHOL HPLF contacts, the 32 amps rating can be maintained. Furthermore, we should be able to use a size 20 contact interface. This dramatically increases the current rating from a typical size 20 contact (rated at 7.5 amps) to a 16 AWG wire (rated at 32 amps). This represents a gain of more than 4 times the current carrying capacity for this example. This is still well below the current rating of the size 20 HPLF contact of 70 amps, as shown on the chart above, for a busbar application.

The potential contact size reduction (with respect to the wire) on these connectors is as follows:

M39029 contacts / wire AWG	16	12	8	4	1/0	4/0
HPLF contacts	20	16	12	8	4	1/0

The smaller size contact would produce a smaller connector interface or more contacts could be accommodated on the same interface. This would result on a lower weight connector, approximately 1/3 the weight of a standard connector.



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Another advantage of this design is the low engagement forces achieved due to the reduced contact normal forces. As a result, insertion and withdrawal forces, as well as contact wear are minimized. The contacts maintain a highly redundant contact surface, as well as a wipe across the mating surfaces to clear debris and to break oxide layers.

With these HPLF connectors, DCX-CHOL provides a full set of cable assemblies and other turn-key options. Hi-power wired or cabled terminations are overmolded to provide the proper protection for strain relief and sealed environments. Straight, angled and 90 degrees exit terminations with low profile are available. Other options and performance requirements can be incorporated and tested, as required by the program.

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