

In the 1970's, Flat Flexible Cables (FFC) were adopted as a standard interface to jumper between printed circuit boards. While these cables provided design engineers significant packaging flexibility, the termination technology was limited to only two methods:

- Direct Solder: permanent connection for low cost applications.
- Crimped Contacts: separable connection for high end plugability.

Seeing the need for a cost effective termination solution, Elco developed the first card edge style connector in 1986 which would mate directly to the

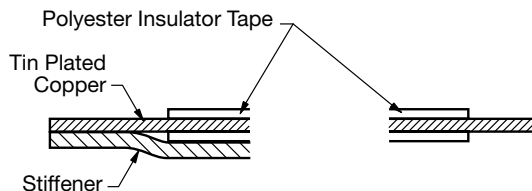
FFC. This Low Insertion Force (LIF) type connector provided simple and reliable mating and unmating of the cable to the printed circuit board. Elco's 8370 Series quickly became an industry standard for cost effective FFC terminations. In 1987, Elco introduced the first Zero Insertion Force (ZIF) connector, Series 6200, which provided increased mating and unmating (durability) cycles.

Since that time, Elco has continued to lead the industry with state-of-the-art products. Today we offer over 45 different product series for flex circuits ranging between 1.25mm and 0.30mm pitch.

FFC/FPC COMPOSITION

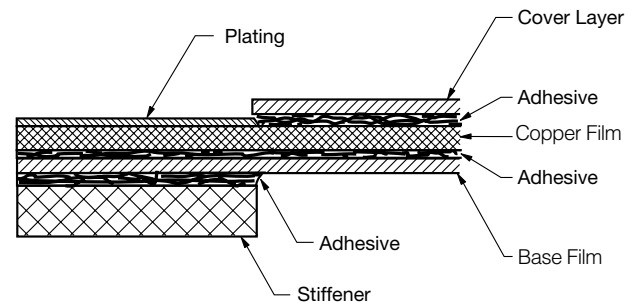
FFC

Flat Flexible Cable (FFC) is made up of thin rectangular copper conductors laminated between two layers of polyester insulation. These copper conductors are left uncovered on each end and then tin plated to make electrical contact with the connector. A stiffener is bonded to the cable end which provides mechanical stability for the exposed copper conductors during mating and unmating. This type of cable is used when a straight one-to-one connection is required.



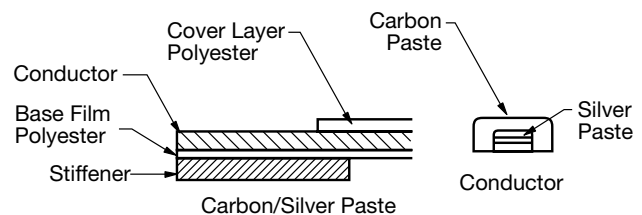
FPC

Flexible Printed Circuits (FPC) are similar in construction to the FFC except that copper film is chemically etched to produce a specific pattern. While these circuits are custom made for each application, various shapes and geometrics can solve the toughest packaging problems.



CARBON PASTE

Screen printing with conductive ink is the newest form of FPC (called membrane) being produced today. In this application, carbon/silver (C/Ag) paste replaces the traditional copper conductor. While very soft and easily damaged, these membrane circuits are cost effective to produce and are lightweight.

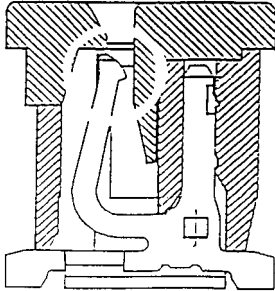


CONTACT DESIGN

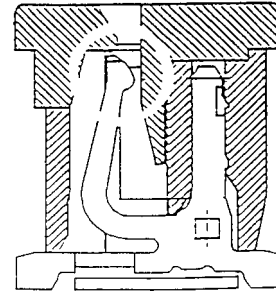
In keeping pace with FFC/FPC Technology, Elco has developed two different contact geometrics to guarantee reliable gas tight connections. The standard contact, which is available in all series, was designed to mate with all copper based FFC/FPC. This initial

contact system proved to be too damaging to the softer carbon silver paste. In 1985, Elco introduced the first contact specifically designed for this application. Incorporating a radiused point, this new contact provides the reliability needed to meet today's mechanical and environmental environments.

STANDARD CONDUCTOR



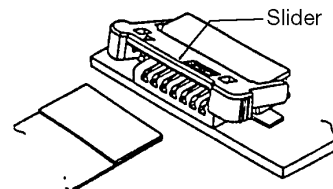
C/Ag CONDUCTOR



CONNECTOR TERMINOLOGY

ZIF (Zero Insertion Force)

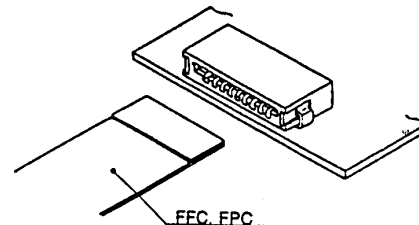
This connector style allows the highest possible number of mating cycles (30) for FFC/FPC. This connector incorporates a mechanical slider mechanism which snaps down over the cable after it is inserted into the insulator body.



ZIF

LIF (Low Insertion Force) / NON ZIF

This style is the most cost effective FFC/FPC connector while still providing reliability. The prepared cable is gently pressed into the insulator slot. There are no moving parts, however, maximum durability is 10 mating cycles.



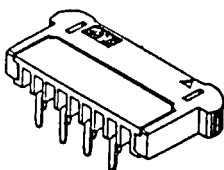
LIF

FUNCTIONAL COMPARISON OF ZIF AND LIF

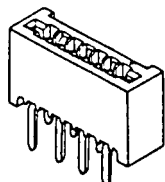
	Durability	Reliability	Cost	Size
ZIF	Better	Better	Good	Good
LIF	Good	Good	Better	Better

PCB TERMINATION STYLE

THROUGH HOLE

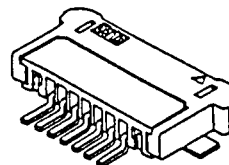


Right Angle

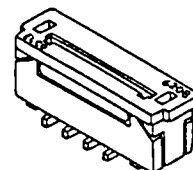


Straight

SURFACE MOUNT



Right Angle

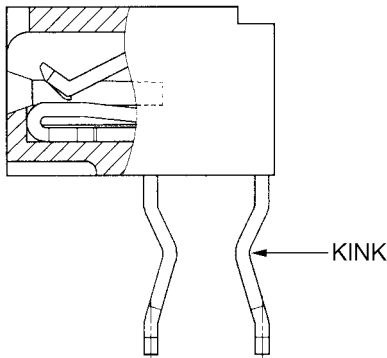


Straight

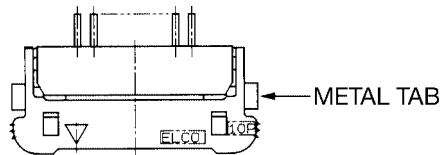
PLACEMENT FEATURES

These help to position the connector on the printed circuit board and provide mechanical support, especially in SMT applications.

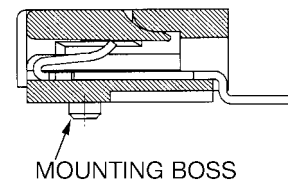
KINKED LEGS



METAL TAB / STRAIN RELIEF



MOUNTING BOSS



CONTACT ORIENTATION

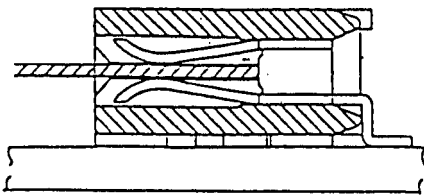
Dual Sided Contacts (LIF Only): Cable orientation is not as critical.

Single Sided Contacts (Includes Top and Bottom): This style requires the FFC/FPC to be inserted into the insulator where by the exposed copper matches with the contact.

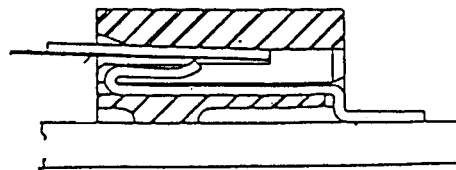
Choosing the correct connector eliminates flipping the FFC/FPC 180°. EXAMPLES:

		Bottom Contact	Top Contact
1.00mm	ZIF	6200	6224
0.50mm	ZIF	6210	6212
0.50mm	LIF	6222	6223

DUAL SIDED



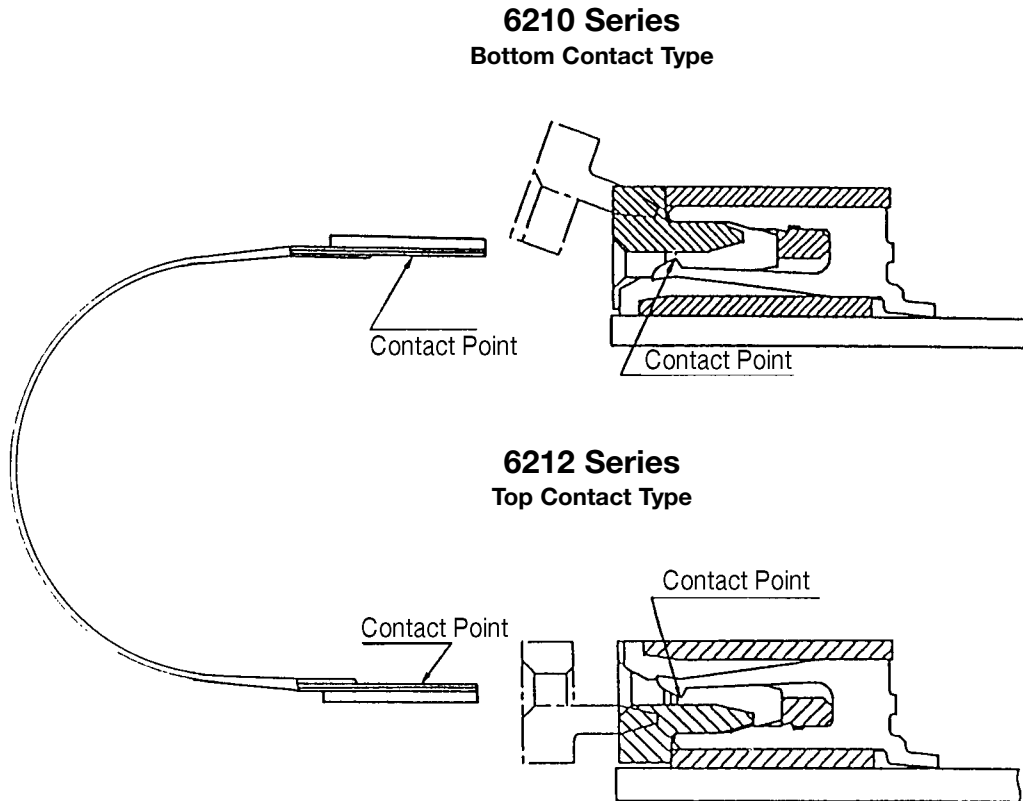
SINGLE SIDED-BOTTOM CONTACT



FUNCTIONAL COMPARISON OF DUAL AND SINGLE SIDED LIF CONTACTS

	Durability	Reliability	Cost	Orientation
Dual	Good	Better	Good	None
Single	Better	Good	Better	Yes

TYPICAL SINGLE SIDED CONTACT APPLICATION



NEW FEATURES TO LOOK FOR:

- Standard 30-50 position 0.50mm pitch ZIF connectors (Series 6240)
- 0.90mm insulator height – lowest in the industry (Series 6250 and 6252)
- New cost effective 0.50mm LIF connectors (Series 6222 and 6223)
- Enhanced line of 1.00mm LIF connectors (Series 6226, 6227 and 6232)
- Integral pick and place flange (eliminates Kapton tape) for straight SMT application (Series 6232)
- New time saving flip-top ZIF (Series 6239 and 6240)
The flip-top/one-touch lock saves time in inserting or withdrawing the cable. Additionally, it saves valuable PCB space as the lock does not extend outside the footprint profile of the connector when opened.