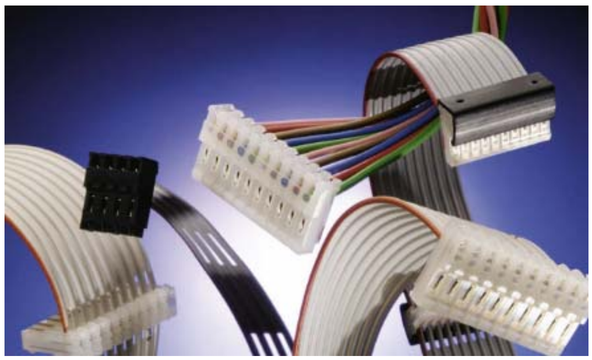
1.0 PRODUCT DESCRIPTION

1.1 MAS-CON Connectors are manufactured by PANCON Corporation. The PANCON .100″ pitch MAS-CON IDC Sockets allow a reliable and economical method to bring signals to a printed circuit board (PCB) using discrete wire or pre-notched flat cable.



1.2 MAS-CON connectors are offered in end connector (CE), end tab polarized (CEP), through (CT), and thru tab polarized (CTP) in tin or precious metal plating. The connectors terminate to 22, 24, 26 and 28 AWG cable and are offered in 2 to 28 positions.

2.0 BULLETIN

2.1 This product bulletin has been issued to provide insight into the possible damage of MAS-CON connectors in some Motion Laboratories equipment. This is due to misuse and improper dis-assembly and re-assembly of the MAS-CON product in the field.

2.2 ***The connectors are intended to be a single use application.***

2.3 Pulling the conductors out and re-inserting (even with the proper application tooling) or reusing the connector is not permitted.

2.4 ***If the connector assembly is reused as described above, the connection points will become compromised. This will result in failed or intermittent terminations that will cause system malfunctions.***

2.5 If your installation requires you to remove the connector for any reason, contact a customer service agent or a quality assurance agent at Motion Laboratories Inc. for assistance.

3.0 DEFINITIONS

3.1 INSULATION DISPLACEMENT CONTACT (IDC) - An insulation-displacement contact, also known as insulation-piercing contact (IPC), is an electrical connector designed to be connected to the conductor(s) of an insulated cable by a connection process which forces a selectively sharpened blade or blades through the insulation, bypassing the need to strip the conductors of insulation before connecting. When properly made, the connector blade cold-welds to the conductor, making a theoretically reliable gas-tight connection

4.0 BACKGROUND

4.1 These connectors use an insulation-displacement contact (IDC) For further information see Insulation Displacing Connector Technology in Addendum Section below.

4.2 When properly made, the connector blade cold-welds to the conductor, making a reliable connection.

4.3 ***The IDC connectors are not reusable***. If there is a need to replace the connection, the conductors should be cut off at the connector and re-inserted into a new connector using the manufacturers supplied application tooling.

4.4 The MAS-CON connectors are installed using manufacturers application tooling that ranges from small manual tools for low volume prototyping to "controlled cycle" hand tools for medium to high volume applications shown below.

- Hand Tool – ideal for maintenance, repair or prototyping.
- Low Volume

Hand Tool MRT

Part No.	Connector Spacing
MRT-100F	.100" (2.54mm)
MRT-156F	.156" (3.96 mm)

- Lightweight – easy to use.
- Automatically indexes to next circuit position.
- Medium Volume

Manual Tool MCT

Part No.	Description	Weight
MCT*	Manual Hand Tool	.6 lbs. (0.28 kg)

*** For use with interchangeable nose sections – CTD.**
Order nose sections separately. (See page 18)

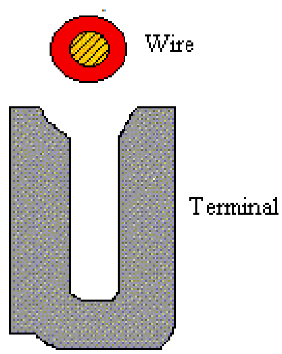
4.5 The connections made by the MAS-CON connector system are critical to proper operation of associated components. It is imperative that these connection points are made using <u>only approved application tooling and proper procedures.</u>

5.0 ADDENDUM

5.1 Insulation Displacing Connector Technology.

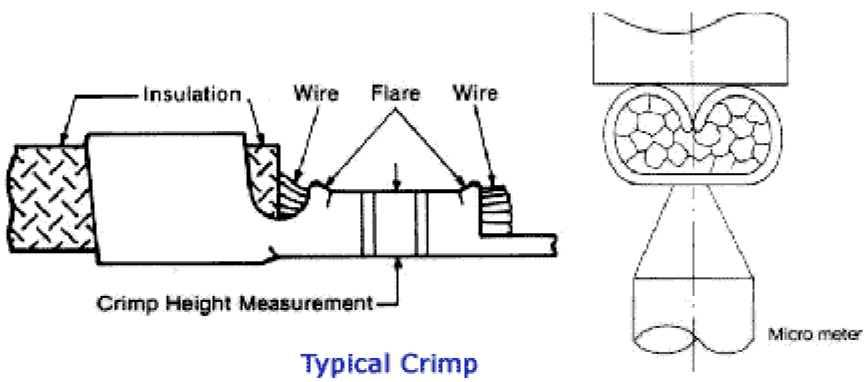
5.1.1 The following information is provided to indicate the intricate nature of the process and the requirement to perform the process properly and in accordance with manufacturers instruction.

5.1.2 Insulation displacing wire termination methods are commonly used in a variety of applications. This termination technique is successfully used in many industries where mass terminations of multiple contacts is cost effective. Multi-wire termination is possible with IDC because the termination forces are relatively low (typically several pounds versus hundreds of pounds for crimps). In addition, the technology provides a bonus in eliminating the wire stripping operations required in crimping. The advantages of this technology are low applied cost and high reliability.



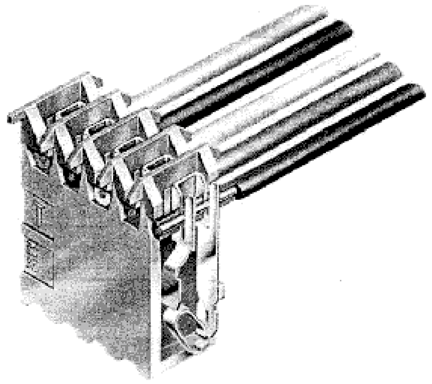
Wire before being displaced

5.1.3 The essential difference between a crimp and an IDC contact is the way in which wire deformation is achieved. With crimps, the pre- stripped wire and terminal are severely deformed under high pressure crimping dies to break through oxides and achieve metal to metal contact. This involves plastically deforming the terminal and axially extruding the wire by applying a relatively high force per contact. Usually cold welding is produced at the asperity level while very little elastic energy is stored in the terminal system. The critical dimensions for crimped contacts are the tolerances on crimp heights achieved with the crimping tool (as shown below). This requires careful set up and continuous monitoring to maintain crimp height quality as a function of time.



Typical Crimp

5.1.4 In contrast, much lower forces are needed for IDC terminations. In this case, the insulated wire is pressed into a slot that is designed to displace the insulation and remove oxides by deforming the wire with shear forces that produce localized plastic deformation. This is done in one motion and provides a gas tight high-pressure interface between the wire and terminal. A robust IDC system is designed to store substantial energy in the terminal as the latter acts as a spring member during and after termination.



Typical IDT

5.1.5 In IDC terminations, slot width and insertion depth are important. The slot width dimension is easily controlled to tenths of mils in the blanking process. In addition, wire insertion is accomplished with a tool that provides easy control of the insertion depth. As insertion depth tolerances are typically several mils, termination quality can be monitored by visual examination. This is relatively easy to accommodate in a production environment and therefore offers an additional advantage over crimping.

5.1.6 The mechanical stability of IDC terminations depends on the spring properties of the terminal and loading conditions of the wire. This is relativity easy to control from a design point of view. In addition, external strain relief of the cable protects against movement at the wire terminal interface. In the case of solid wire, with proper strain relief, the IDC termination will perform as well or better than crimps because of the inherently greater mechanical stability. This is due to the amount of elastically stored energy in the deflected terminal which maintains a high-pressure interface. Typically, for small wire sizes such AWG 26, the terminal is designed to provide several pounds of force at the interface and several mils of elastic deflection. In the case of larger wires such as AWG 20, the forces could go as high as 15 to 20 pounds.

5.1.7 With regard to stranded wire, the mechanical stability of the strand bundle plays a significant role in performance. There are two factors that effect performance. First; since the strand bundle is under compressive load, there is a tendency towards lower contact forces as the bundle relaxes in the slot due to mechanical disturbance, stress relaxation and creep. The level of potential relaxation depends on the type of stranded wire used. The number and lay (or twist) of the strands, the conductor top coating (plating) and the type of insulation play a role in mechanical stability.

5.1.8 Since each type of wire represents a unique set of parameters, it is necessary to evaluate the loading characteristics in each case to determine the design criteria for terminating a specific type of wire. The loading characteristics of solid or stranded wire can be measured in the laboratory with a force gage that is fixtured to simulate a slot for a given lead-in geometry. The results are used to determine the loading requirements for the terminal (as shown below). The wire loading characteristic can be superimposed on the force deflection curve of a given design. It should be noted, the ramp angle, transition radius and material thickness significantly affect the loading characteristics of a given wire.

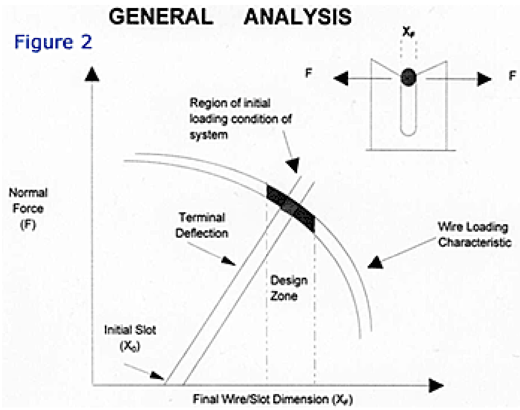


Figure 2

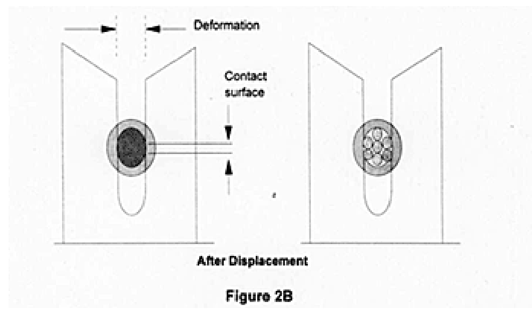


Figure 2B

5.1.9 In following this analysis, the design objective is to provide a terminal that crosses the wire curve in a predetermined design zone. The design zone for a given geometry is determined by inspecting the wire interface region after insertion in the simulation fixture. By definition, the design zone is the region of the loading curve where the insulation is displaced, and the conductor is effectively deformed to establish high pressure metal to metal contact. In the case of stranded wire, the design zone typically represents the most mechanically stable region of the loading curve where good contact is made to as many strands as possible without severely damaging individual strands.

6.0 TECHNICAL SUPPORT

6.1 For technical support, contact a quality assurance or customer service representative using the information provided below. Refer to this product bulletin.

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