Continuous growth in use of ribbon cables in consumer, industrial, medical and other applications necessitates knowledge of their proper handling.

Proper handling of terminated ribbon connectors will assure their performance and will reduce need for unnecessary test procedures and failure analysis.

This documment should be used in conjunction with already issued Ribbon Cable Connector Handbook.

If needed, please contact nearest Hirose Electric office.

1 Pulling or Becoming Caught in Cables is Dangerous!

1.Pull or exception of force on the installed and terminated ribbon cable can damage the termination of individual conductors to the contact, resulting in intermittent or permanent failures.

Individual conductors are of small diameter (7/0.127mm) AWG #28 and may break or be damaged when pulled or restrained by obstruction.

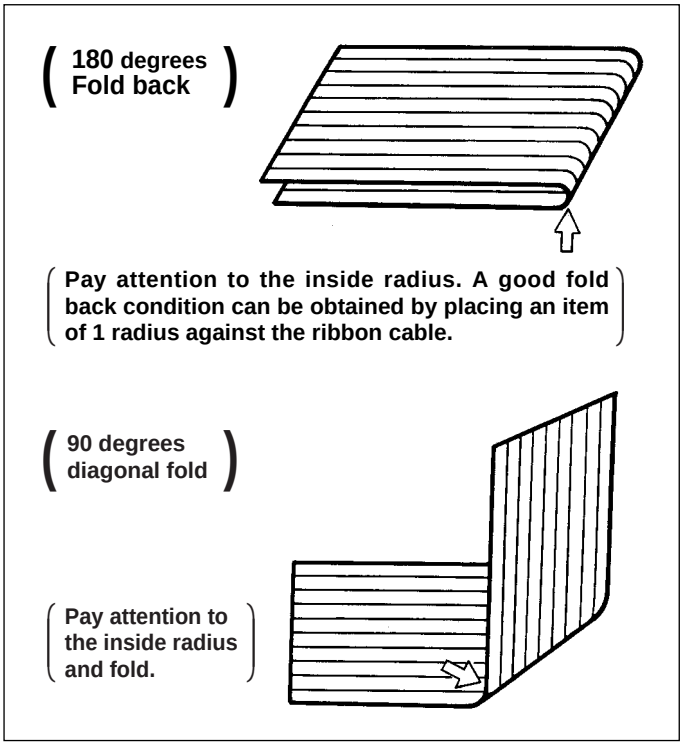
Special attention should be excersised during the following activities:

1-1 Mating/un-mating terminated connectors.

NEVER pull on the ribbon cable to un-mate connectors. Follow manufacturers recommendations as to correct procedure.

1-2 Working on the your system when connectors are already terminated and installed.

Excercise caution to avoid any pull or twist to the ribbon cable. This may damage the connection areas in the connector itself.



[Figure-1] Cable Folding Precautions

1-3 Folding of the terminated ribbon cables.

As a general rule, use minimum radius of 1 thickness of the ribbon cable.

For a 180 degree fold-back it is good practice to bend it over a hard object (pin) having min. radius of the ribbon cable thickness.

The same applies to a 90 degrees diagonal fold.

Attention should be paid when folding ribbon cable as it exits the connector.

This is extremely important when the connector does not have attached stain relief.

As a rule, even when folding careful, no more than 10 bends of this type should be made.

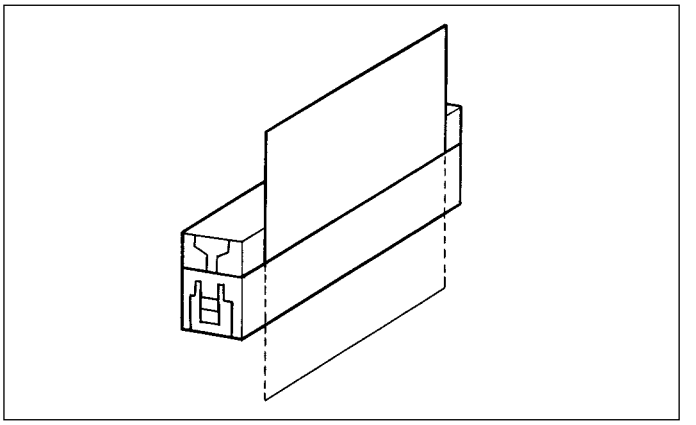
2 Pay Attention to the Following Points When Folding the Cable

2-1 When folding the cable in an application, use a radius of on the order of 1. Attention should especially be paid when the cable is folded back 180 degrees. The same attention should be given to diagonal folds when folding the cable.

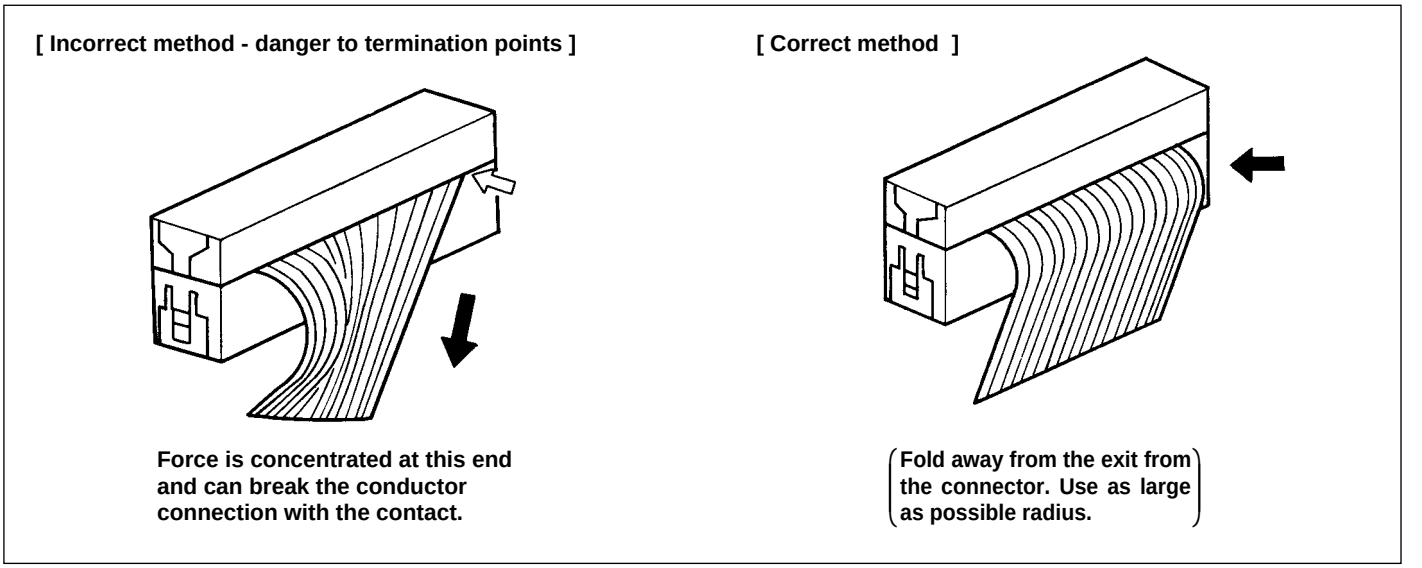
2-2 Special care should be excercised when folding ribbon cable at the point of exit from the connector. This is even more critical when the connector does not have strain relief. Any application of force in the directions shown on Figure 4 may be transferred to the contact points between conductors and contact resulting in connection failure. Even when making careful bends of the ribbon cable without any pull force, it is recommended that no more than 10 bends should be made.

The HIF2 type connector is designed for use with flat ribbon cables.

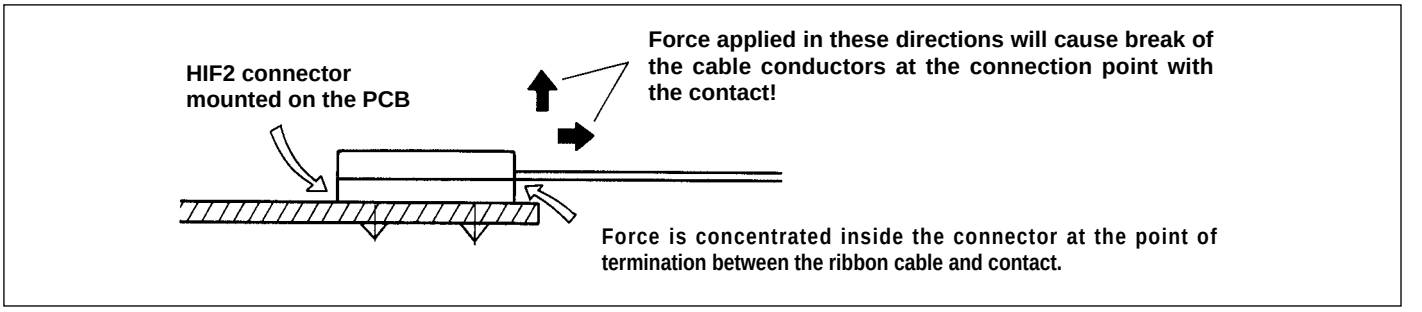
The connector is installed on the printed circuit board. The ribbon cable is inserted into it and uniform pressure on the top of the connector is applied.



[Figure -2] Folding Precautions when bending ribbon cable immediately at the exit from the connector



[Figure-3] In ncorrect and correct ribbon cable bends



[Figure -4] HIF2 Type Handling Precautions

This causes the contacts to pierce the insulation and uniformly connect with each of the conductors in the ribbon cable. Any pull force on the ribbon cable can be transferred to these contact points.

When using HIF2 type connectors, provide sufficient length of the ribbon cable.

3 Precautions When Using Connectors

3-1 When using pin headers other than those equipped with an eject lock (e.g., the HIF3E Series or the HIF3F Series), please indicate that the Puller Tab must be attached to the connector socket side. This will prevent accidental pull of the ribbon cable.This can prevent accidents in which the cable is pulled.

Listing of Hirose connectors using the puller tabs is shown below.

Number of Contacts	Part No.
10	HIF3-10CL
16	HIF3-16CL
20	HIF3-20CL
26	HIF3-26CL
30	HIF3-30CL
34	HIF3-34CL
40	HIF3-40CL
50	HIF3-50CL
60	HIF3-60CL

3-2 Precautions When Using Multiple Connectors in a Serial In-line Arrangement (As used in design of Bus Lines, power distribution, etc.)

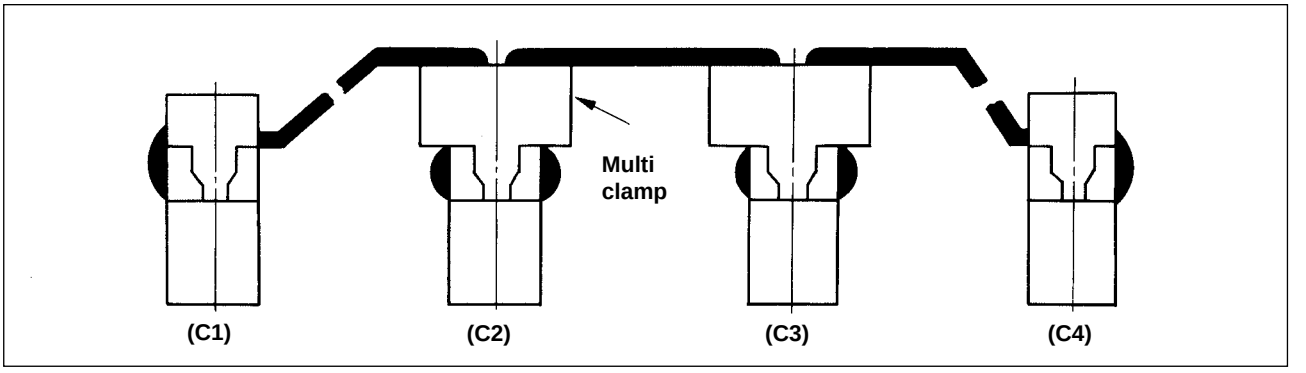
(1) In a usage example such as that depicted in the simplified diagram below (Figure 5), be certain to provide a margin of the required length plus 10 mm or more for the length between each connector.
As an example, when there is no leeway in the cable length and connector C2 is disconnected while connector C1 and connector C3 remain inserted in the mounted pin headers, the ribbon cable of connector C1 and connector C3 is pulled, which could lead to failure of the connection between the ribbon cable conductors and the connector contacts.

(2) A multi-clamp should be attached to connector C2 and connector C3 and others.(See Figure 5.)

Hirose's multi-clamps are available under the following product names.

Number of Contacts	Part No.	Number of Contacts	Part No.
10	HIF3-Multi clamp (10)	34	HIF3-Multi clamp (34)
16	HIF3-Multi clamp (16)	40	HIF3-Multi clamp (40)
20	HIF3-Multi clamp (20)	50	HIF3-Multi clamp (50)
26	HIF3-Multi clamp (26)	60	HIF3-Multi clamp (60)
30	HIF3-Multi clamp (30)		

Note: Hirose product with lock attached is the HIF3BAE-*PA-2.54DS(A).



[Figure -5] Example of Multi clamp Usage in a serial in-line connection

4. Recommended Conditions for Soldering of Connectors

4-1 When using reflow solder process (with an Automatic Soldering Machine)

4-2 Hand Soldering
Recommended temperature: 280EC to 300EC
Recommended time: Max. 4 seconds
Recommended soldering iron power: 30 W to 40 W

5. Precautions When Selecting a Cleaning Agent

The insulation material used in HIF series connectors has excellent chemical resistance properties, but attention should be paid to the following points.
Most alcohol type solvents and some chlorine type organic solvents can be used as cleaning liquid.
Please see Table 1.
Note that the ribbon cable cannot be cleaned under the same conditions as the connectors HIF2 and HIF12 types. Please see Table 2.

Table 1. Cleaning of Connectors Only

Solvent	Normal Temperature Cleaning	Heated Cleaning
IPA (Isopropyl alcohol)	✔	✔
HCFC (Hydrochlorofluorocarbon)	✔	✔

Table 2. HIF2 and HIF12 Type (Products that Can Sustain the Effects of Cleaning up to the Ribbon Cable)

Solvent	Normal Temperature Cleaning
IPA (Isopropyl alcohol)	✔ 5 minutes max.

✔ Cleaning permitted

Normal temperature cleaning process examples:
(1) Immersion
(2) Brush washing
(3) Ultrasonic

Heated cleaning process examples :
(1) Immersion under boiling conditions
(2) Vapor (steam)

Note:
Note:When using water type cleaning agents (e.g., terpene, and alkali saponifiers), cleaning agent residue may remain on connectors (depending on the washing conditions) and this may cause deterioration of electrical performance.
Make sure that all cleaning agents are removed from connectors.
Should you have questions regarding connector usage, please contact the Hirose HIF Engineering Department.