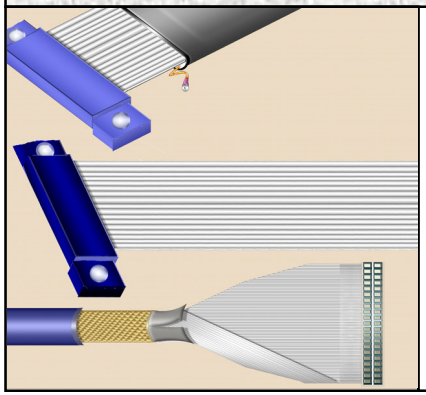
CABLE AND HARNESS
FLAT / RIBBON CABLE

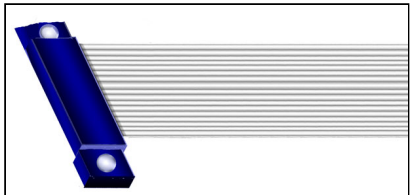


FLAT / RIBBON CABLE

Flat cable is a multi-conductor cable comprised of individually insulated, solid conductors, which are mechanically bonded in a parallel (flat) orientation.

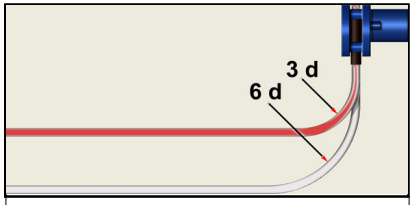
Ribbon cable is a multi-conductor cable, comprised of individually insulated, stranded conductors, which are mechanically bonded to each other in a parallel (flat) orientation.

Both cable architectures result in a highly flexible, compact, and robust cable, allowing mass termination of the conductors to high-density connectors by the insulation displacement contact (IDC) process.



GENERAL REQUIREMENTS

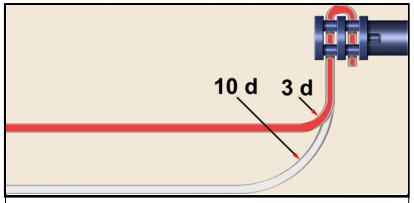
The cable assembly meets dimensional, layout, and design requirements. Conductors are properly aligned to respective termination pins and properly seated. The assembly exhibits a smooth, flat profile, with no visible damage to the connectors or the insulation.



PREFERRED
BEND RADIUS
COAXIAL RIBBON CABLE

The bend radius for coaxial ribbon cables shall not be less than six (6) insulated wire diameters short-term, ten (10) diameters long-term.

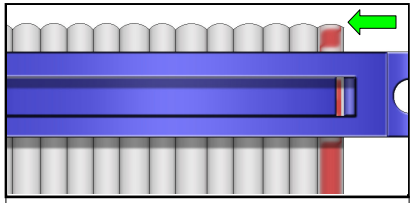
NASA-STD-8739.4 [7.3.21]



PREFERRED
BEND RADIUS
GENERAL

Flat and ribbon cables shall not be creased, folded, or bent less than three (3) insulated wire diameters (short-term). The recommended long-term bend radius is ten (10) diameters.

NASA-STD-8739.4 [7.3.21]

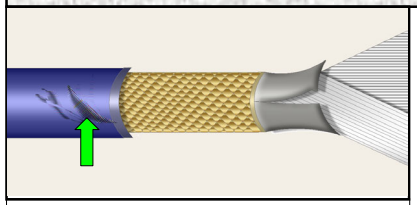


PREFERRED
CABLE-END TERMINATIONS

Cable is properly aligned and oriented in the connector, and the cable end does not protrude in excess of 0.8 mm (0.031 in.) beyond the connector body edge, or violate minimum electrical spacing requirements.

Best Workmanship Practices

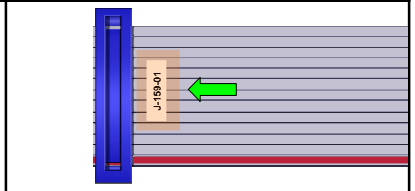
CABLE AND HARNESS
FLAT / RIBBON CABLE (cont.)



ACCEPTABLE
DISCOLORATION / SCUFFING
INSULATION

The cable does not exhibit evidence of insulation damage, such as cuts, nicks, scrapes, crushing, cold flow, or burns. Slight scuffing or discoloration is acceptable.

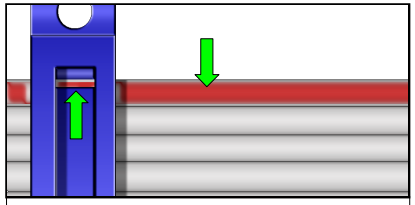
NASA-STD-8739.4 [19.6.2.e.9]



ACCEPTABLE
IDENTIFICATION

Each cable / harness shall be identified by a permanent label / marking. Each connector shall be identified by a permanent label / marking affixed directly to the connector body, or to the cable adjacent to the connector.

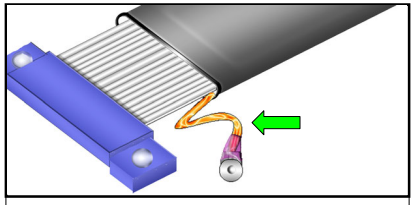
NASA-STD-8739.4 [14.2.1.], [14.2.2]



ACCEPTABLE
POLARIZATION STRIPE / RIDGE

The polarization stripe or ridge (if provided) is visible and properly aligned with the connector polarization mark.

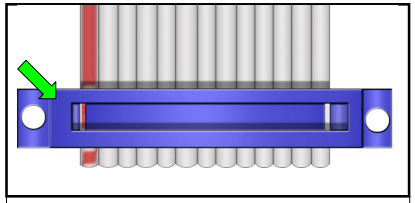
NASA-STD-8739.4 [19.6.1.e.10]



ACCEPTABLE
SHIELD / DRAIN WIRE

Shield and drain wire are properly terminated, per engineering documentation.

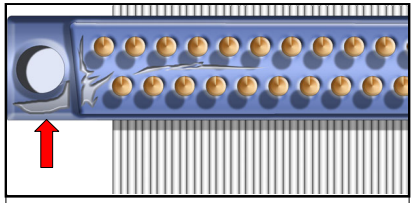
NASA-STD-8739.4 [19.6.1.f.2]



ACCEPTABLE
STRAIN RELIEF

Connector-mounted strain relief clips shall be properly positioned and set.

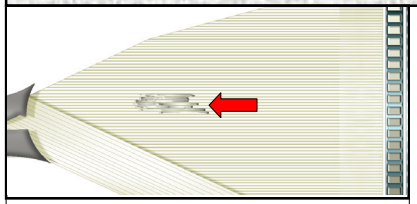
NASA-STD-8739.4 [19.6.1.e.23]



UNACCEPTABLE
DAMAGE
CONNECTOR

Damage to the connector (i.e.: cuts, gouges, cracks, deformed features, bent pins, exposed base metal, etc.).

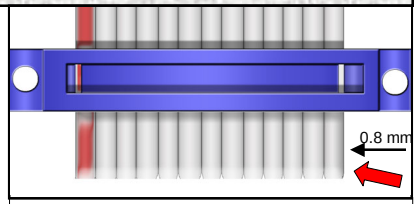
NASA-STD-8739.4 [19.6.1.e.1]



UNACCEPTABLE
DAMAGE, INSULATION

Damage to the cable jacket, ribbon, or conductor insulation (i.e.: cuts, pinching, nicks, scrapes, crazing, crushing, cold flow, exposed conductors, punctures, thinning, or burns).

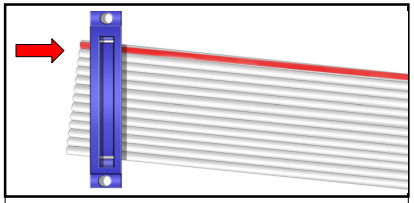
NASA-STD-8739.4 [19.6.2.e.9]



UNACCEPTABLE
EXCESSIVE CONDUCTOR PROTRUSION

Cable conductor end(s) protrude in excess of 0.8 mm (0.031 in.) beyond the connector body edge, or violate minimum electrical spacing requirements.

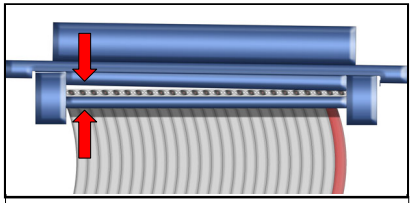
Best Workmanship Practice



UNACCEPTABLE
IMPROPER ALIGNMENT

The completed assembly does not exhibit parallel alignment between the connector body and the cable, resulting in improper electrical termination of each conductor to its designated pin.

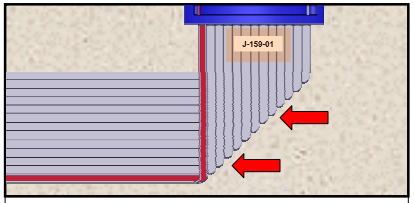
Best Workmanship Practices



UNACCEPTABLE
IMPROPER ASSEMBLY

The cable / connector assembly shall be terminated by the application of a uniform compression across the face of the connector, and shall exhibit parallel alignment between the connector base and compression cap.

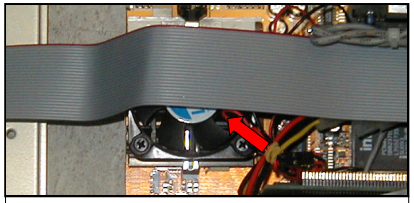
Best Workmanship Practice



UNACCEPTABLE
IMPROPER BEND RADIUS

The cable exhibits creases, folds, and/or kinks, which are less than the minimum bend radius, and/or which have visibly stressed the insulation material.

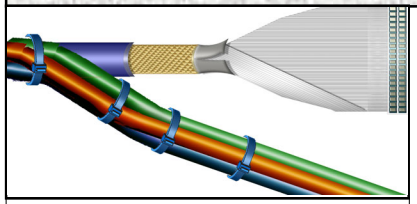
Best Workmanship Practices



UNACCEPTABLE
IMPROPER ROUTING

Flat and ribbon cables should not be routed near high electrical noise, heat, or vibration sources, or routed so as to not interfere with air ventilation flow patterns.

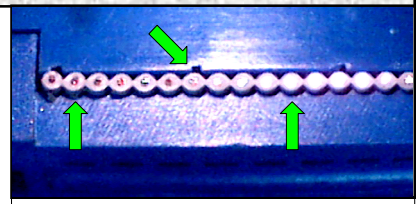
Best Workmanship Practices



PREFERRED
DISCRETE WIRE HARNESS DESIGN

Ribbon cables shall not be incorporated into discrete wire harnesses, unless specifically designed for that application. Ribbon cable suitable for harness installation shall be of a round-to-flat, transition / breakout type.

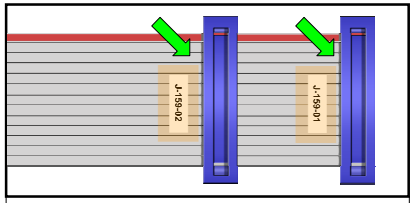
Best Workmanship Practice



PREFERRED
ELECTRICAL TERMINATION

The completed connector assembly shall result in the electrical termination of each conductor to the respective termination pin. The termination exhibits alignment to the connector fiducials (small notches / marks) and grooves.

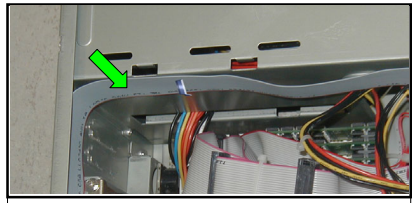
Best Workmanship Practice



PREFERRED
INLINE TERMINATIONS

Inline terminations shall be properly oriented and completed only in locations along the cable designed for such terminations, and where sufficient strain relief is available.

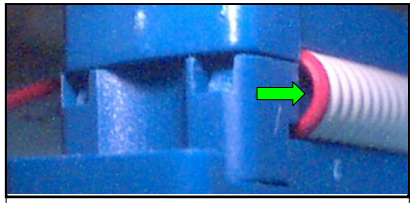
Best Workmanship Practice



PREFERRED
ROUTING

Ribbon cables should be routed along flat surfaces (either vertical or horizontal) whenever possible, shall be properly supported and secured by cable clamps, and should not be routed near high electrical noise, heat, or vibration sources.

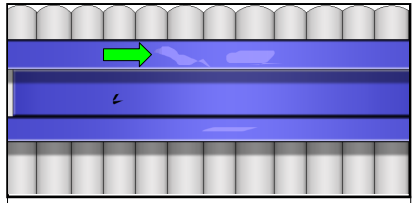
Best Workmanship Practices



ACCEPTABLE
BEND RADIUS

The cable exhibits proper bend radius at entry and exit of the strain relief clamp device.

NASA-STD-8739.4 [7.3.21], [7.3.22]

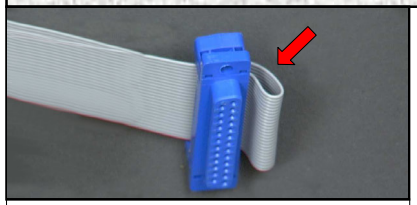


ACCEPTABLE
DISCOLORATION / SCUFFING
CONNECTOR

Slight scuffing or discoloration is acceptable, provided there is no impact to form, fit, or function, and there is no exposure of base metal.

Best Workmanship Practice

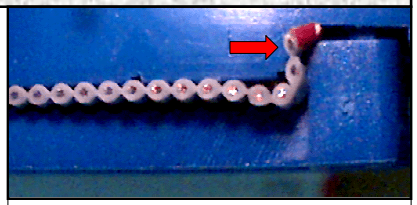
CABLE AND HARNESS
FLAT / RIBBON CABLE (cont.)



UNACCEPTABLE
IMPROPER STRAIN RELIEF

Wires exiting from connectors shall be stress relieved. Connector strain relief clamps shall be properly set.

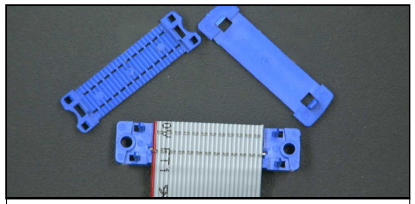
NASA-STD-8739.4 [7.3.22]



UNACCEPTABLE
IMPROPER TERMINATION

The completed connector assembly shall result in the electrical termination of each conductor to the respective termination pin. The termination shall exhibit alignment to the connector fiducials (small notches / marks) and grooves.

Best Workmanship Practice



UNACCEPTABLE
MISSING COMPONENTS

Missing connector parts (i.e.: compression cap, strain relief clip, polarizing key, etc.) shall be cause for rejection.

NASA-STD-8739.4 [19.6.1.e.17]

THIS PAGE IS
INTENTIONALLY BLANK.