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.

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 ]

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 ]

SHIELD / DRAIN WIRE

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

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

STRAIN RELIEF

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

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

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
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

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

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JOHNSON SPACE CENTER
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Page: 4
### 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]*

#### 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*

#### 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]*