Flexibility

ASTM D-1737-89 Withdrawn Standard: ASTM D1737-85

WITHDRAWN, REPLACED BY D522

ASTM D522

MANDREL BEND TEST (METHOD B)

This test method determines the ability to resist cracking (flexibility) of coatings on substrates of sheet metal. The samples are applied at a uniform thickness then bent over a mandrel and the resistance to cracking is determined. - A test panel is placed over a mandrel and using a steady pressure, bent approximately 180º around the mandrel. - The sample is the removed and examined for any visible cracking to the unaided eye. - This procedure is repeated using successively smaller diameter mandrels until failure occurs.

Mandrel Bend Test – Use and factors to be considered:

Fully cured coated panels are bent over a mandrel and the resistance to cracking of the coating is determined. In Test Method A the coated panels are bent over a conical mandrel. In Test Method B the coated panels are bent over cylindrical mandrels of various diameters.

Coatings on panels are elongated when the panels are bent upon manufacturing or when abused in service. This elongation, if the coating/curing process is not adequate can lead to cracking causing problems ranging from poor appearance to premature corrosion of the panel substrate. ASTM D522 is used in rating the coatings for their ability to resist cracking when this happens.

Example: ASTM D522 mandrel testing on a Powder Coating TDS Sheet:

Film Thickness (ASTM D)	2.0 – 3.0 mil
Gloss 60'angle (ASTM D-523-89)	95+%
Hardness (ASTM D-3363-92A)	2H
Flexibility (ASTM D-522)	1/8 inch
Adhesion (ASTM D-3359-95A)	5b (100%)
Impact Direct/Indirect (ASTM D-2794-93)	160/160 inch-lb.
Exterior Durability	Good
Salt Spray (ASTM B117)	1,000Hrs+ < 3mm
Specific Gravity	1.29±0.03