

GEAR Industrial Shock Cord Data And Maintenance

General Service Life:

In active service, standard replacement is recommended at five years from the date of installation or manufacture, regardless of pristine appearance.

Environmental Factors:

Exposure to high heat, ozone, UV sunlight, moisture or petroleum / hydraulic fluids can degrade the rubber core in a fraction of its rated time, sometimes failing within months.

Elongation Percentage:

Stretching a cord near its maximum limit decreases service life.

Dynamic vs Static Load:

High-velocity snap-backs or heavy shock-loading rapidly fatigues the internal rubber strands.

Outer Jacket:

Once the outer jacket shows extensive frays or cuts or exposes the inner rubber core, the cord should be retired.

Inspection Warning Signs:

The cord fails to snap back to its original relaxed length or feels loose or flaccid.

Fraying, broken threads on the outer jacket or stiffness / cracking in the rubber core.

Drop Testing:

In drop testing, the service life is drastically shorter than in static tie-down or manual stretch applications. The cord degrades across three distinct phases during its service life.

Phase 1 - Break In 1-10 Cycles: New, pristine shock cord exhibits structural hysteresis. The first few drops will stretch significantly farther and fail to return exactly to its original length.

Phase 2 - The Stable Window 11-100+ Cycles: The cord will provide its most consistent, repeatable force-displacement and energy-absorption curves.

Phase 3 - Fatigue & Softening 100-300+ Cycles: The internal rubber strands experience micro-tearing. The cord will begin to soften and require less force to stretch to the same distance which may skew the drop-test velocity or deceleration metrics.

The 24-Hour Recovery Rule: Natural and synthetic rubber strands suffer from temporary material fatigue. If you perform 20 drops in rapid succession, the cord will temporarily lose its elasticity. Allow the cord to rest unextended overnight to regain its molecular baseline.

The 10% Length Rule: Measure the relaxed length of the cord before its first test. Once the permanent, relaxed length of the cord has stretched by more than 10% of its original size, the cord should be retired.

This indicates the internal rubber strands have permanently deformed.

Force Calibration Drift: If your drop tower utilizes load cells or accelerometers, track the peak G-force or peak load. If your data shows a 5% to 10% drop in peak force across identical weight drops, the cord has softened and should be retired.

Sheath Bunching: Inspect the outer jacket near the termination points. If the jacket begins to bunch up, slip, or show internal white or black rubber strands poking through the outer jacket, the cord should be retired.