

A. Implosion Protection Systems

1. Laminating
2. Banded - Domestic
 - a. Kimcode
 - b. T-Band
3. Banded - European
 - a. Push Thru

B. Theory of Implosion Protection

To retard the propagation of cracks for a fraction of a second while the tube goes to air during impact, thermal shock or any accident in handling.

C. Purpose of Implosion Protection

To provide a safe system for tube builders, set manufacturers, servicing technicians and the customer.

D. Agency Monitoring

U.S. - Underwriters Laboratory
Canada - CSA
England - BSI
Germany - VDE
Scandinavian Countries - Demko

E. Types of Implosion Protection - Bill of Materials E.S. 3-1T-25V (90°)

1 Laminated

- a. Polyester Resin - P-901C
- b. MEK Peroxide Catalyst - C665D
- c. Safety Window - 3665 - 900A
- d. Tape - T-264F
- e. Slitted Filler Valve - FM60706
- f. Filler Valve - M-6155
- g. Retaining Ring - M6156
- h. Tape - T-264D

2. Banded Domestic

- 2A. Kimcode
 - a. Epoxy Resin - R-290A
 - b. Catalyst - R290B
 - c. Rimbands - M9064

- d. Crimp Seals - M9002
- e. Steel Strapping - R9052
- f. Mounting lug - M9067A

2b. T-Band

- a. Steel Strapping - R-9052
- b. Mounting lugs - M-9053
- c. Crimp Seal - R9002, R9077
- d. Tape - T285A, T901A

3. Banded European - Push-thru (PT)

- a. Epoxy Resin - R290A
- b. Catalyst - R290B
- c. Rimbands (lugs attached)- M9059D
- d. Steel Strapping - R9052
- e. Crimp Seal - M-9002
- f. Black Tape - T-909D
- g. R-Bars (23V) - M-9043

F. Process

1. Laminating E.S. 34-40-54 Schedule 2
(There are four laminating schedules)

- 1. Clean panel and safety window.
- 2. Place window on panel and put filler button retainer on with tape.
- 3. Space window and tape.
- 4. Cut out tape hole for fill button.
- 5. Place on conveyor and fill with laminating resin.
- 6. Remove tube and clean resin.

Common Problems:

Cause:

- | | |
|-----------------|---|
| 1. Bubbles | Trapped Air |
| 2. Dirt | Tube or window not cleaned properly |
| 3. Under fill | Insufficient resin, poor taping, too many leaks |
| 4. Striations | Poor resin and catalyst mixing, excessive cleaning solution trapped between window and tube |
| 5. Pre-Gel | Check valve on catalyst line may need cleaning, poor mixing, and/or partial curing of the resin in the line |
| 6. Delamination | Thin resin, less than 50 mil thick, $1\frac{1}{2}$ " from edge of the window |

Incoming Inspection Tests

Laminating Resin

- a. Viscosity
- b. Color
- c. Gel Time

2. Kimcode E.S. 34-40-900 Schedule 7
(There are 19 Kimcode type Schedules)

1. Mix Epoxy Resin - 2 parts resin and 1 part hardener. Resin is white, hardener is black. Mixed resin is dark grey.
2. Apply to rimband
3. Place rimbands on tube
4. Place steel strapping around tube and tension to desired value.
5. Crimp the seal; remove the tensioning tool.
6. With mounting lugs, the lugs have epoxy on the skirt and are placed in a holding fixture before the application of the tension band.
7. Lug "Z" height is checked with a mounting lug gauge.

Common Problems:

- | | |
|---|--|
| 1. Crimp seal in the wrong location | See E.S. for proper tube type |
| 2. Excessive Resin on Tube or Hardware | Improper cleaning and handling |
| 3. Exceeding .078" eyebrow gap or specified gap for tube type | Poor machine set-up, tube movement or poor glass and rimband fit |
| 4. T-Band location too high or too low | Poor machine set-up, tube movement |
| 5. Mounting lug at wrong "Z" height | Poor machine set-up, tube movement |
| 6. Low tension | Tool wear, low air pressure and improper crimping |
| 7. Poor Resin Coverage | Low amount of resin used |
| 8. Soft Resin | Improper proportions |

Incoming Inspection Tests

1. Gel Time
2. Hardness
3. Color

IMPLOSION - PROOFING EQUIPMENT

I. LAMINATED TUBE TYPES

- A. TAPING MACHINE L2872A (PPG)
- B. LAMINATING CONVEYOR L2799CP2
- C. RESIN MIX AND DISPENSE EQUIPMENT L2856DN (NOTE: A 3 COMPONENT SYSTEM MODIFIED FOR 2 COMPONENTS) (MATEER)

II. BANDED TUBE TYPES

A. KIMCODE (WITH OR WITHOUT MOUNTING LUGS)

- 1. RESIN DISPENSER L2856NS1 (HULL)
- 2. TENSION BANDING MACHINE L2872S1 (RCA)
- 3. CLEAN-UP STATION (VARIOUS RCA DESIGNS)
- 4. INSPECTION GAUGES
 - a. ACME TENSION TESTER
 - b. DETROIT TENSILE TESTER
 - c. PINBALL GAUGE L2906GY TO CHECK Z HEIGHT ON MOUNTING LUGS

B. T-BAND

- 1. TAPING MACHINE M2872F (IF REQUIRED)
- 2. BANDING MACHINE L2872S1 WITH APPROPRIATE FIXTURE TOP
- 3. RESIN DISPENSER L2856NS1 (IF REQUIRED)

C. PUSH THRU

- 1. PAN-O-PLY (WELDED TENSION BAND)
 - a. RESIN DISPENSER L2856NS1
 - b. STRAP WELDER L2755DW

(NOTE: THE L2872SZ BANDING MACHINE WAS DESIGNED AS A LOW VOLUME, LOWER COST UNIT TO WELD PUSH-THRU AND IS IN USE IN BRAZIL.)

- 2. CRIMP SEAL DOUBLE BANDED PUSH THRU

- a. RESIN DISPENSER L2856NS1
- b. BANDING MACHINE L2872S1 WITH A DOUBLE BANDING
ROTATING FIXTURE TOP

III. P-SHELL

- A. P-SHELL PROCESS STATION L2799CZ1

IV. SHELL BOND

- A. ROTATING HOLDING FIXTURE
- B. CENTERING GAUGE
- C. HAMILTON BEACH BLENDER FOR RESIN MIXING
- D. LAMINATING LINE FOR CURING