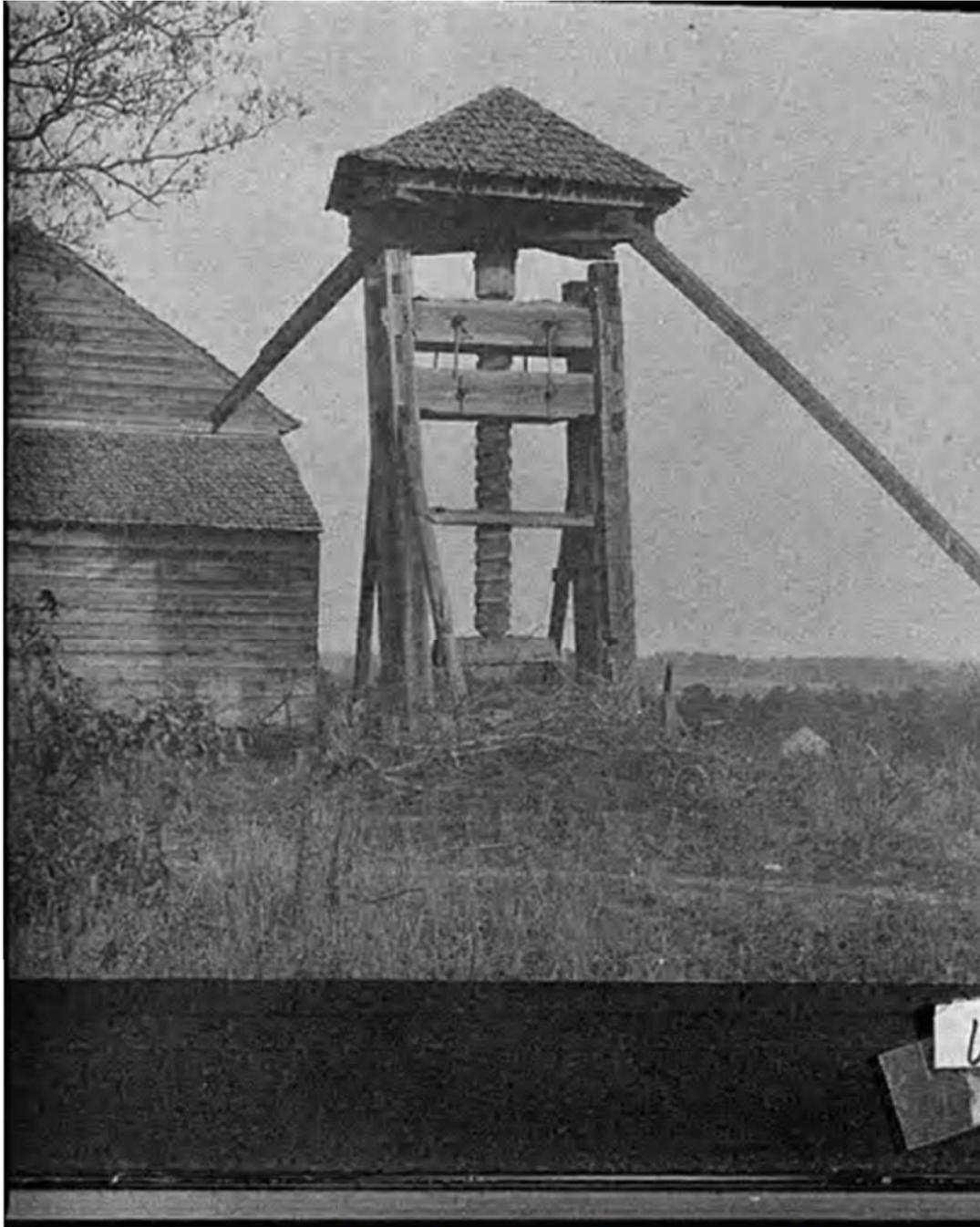


*Bale Press  
Maintenance  
and Bale Shape  
Uniformity*

*Joe W. Thomas - Vice President of Technology - Lummus Corporation - Savannah, GA USA*



Georgia Division of Archives and History

# *Effects of Poorly Shaped Bales*

- ❑ Difficult or impossible to stack bales properly
- ❑ Increased handling time per bale
- ❑ Loss/Decrease of available storage space
- ❑ Safety Concerns associated with bales potentially falling
- ❑ Increased storage costs







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# *Factors that can influence bale shape*

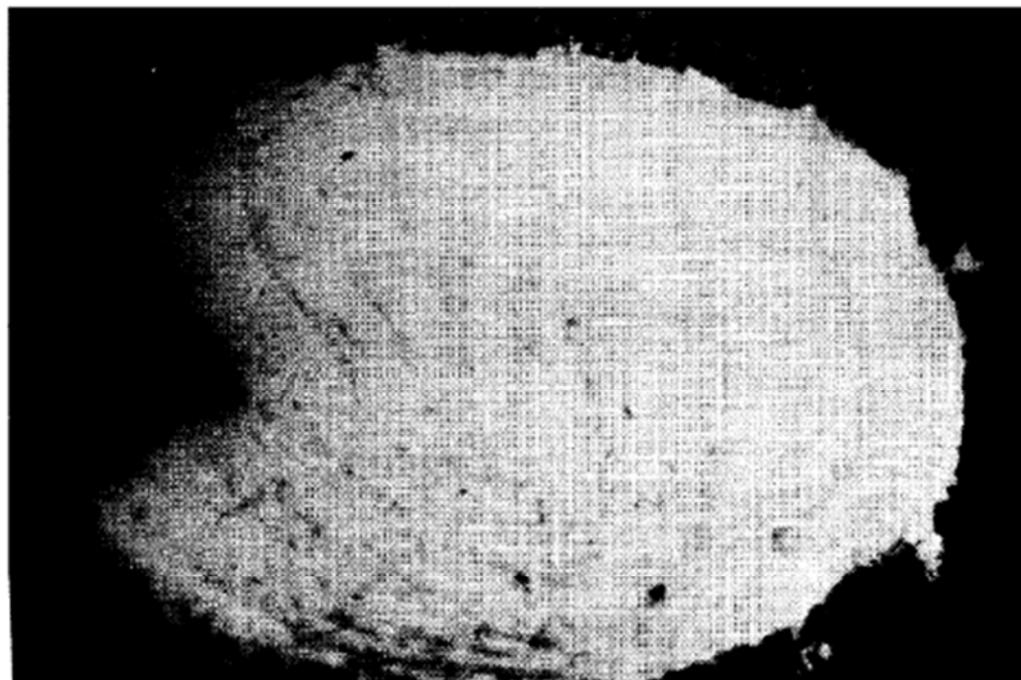
- Non-uniform feed to Battery Condenser
- Non-uniform feed to Press Box by Lint Feeder
- Moisture content of the lint cotton
- Press Dog maintenance
- Compression Chamber shape/maintenance
- Floor Sleeve vs. no Floor Sleeve
- Extrude Pressure (Door-Less Presses)
- Follow Block Clearance, Platens and Guides

# *Non-Uniform Feed*

- ❑ Uneven spread of lint in lint flue riser and across Battery Condenser Drum can result in a “big ended” bale at the press.
- ❑ Uneven distribution of lint in the charging box by the lint feed device can result in a “rolling,” or heavy sided bale.
- ❑ Follow block guides help mitigate impact of “rolling” bale although accelerated guide wear may result.
- ❑ Uneven feed creates excessive side loading on press boxes, floor sleeves and hydraulic cylinder bearings resulting in premature failure and/or bed sill shift.



Big Ended Bale



Rolling Bale

## *Lint Moisture Content – Too Low*

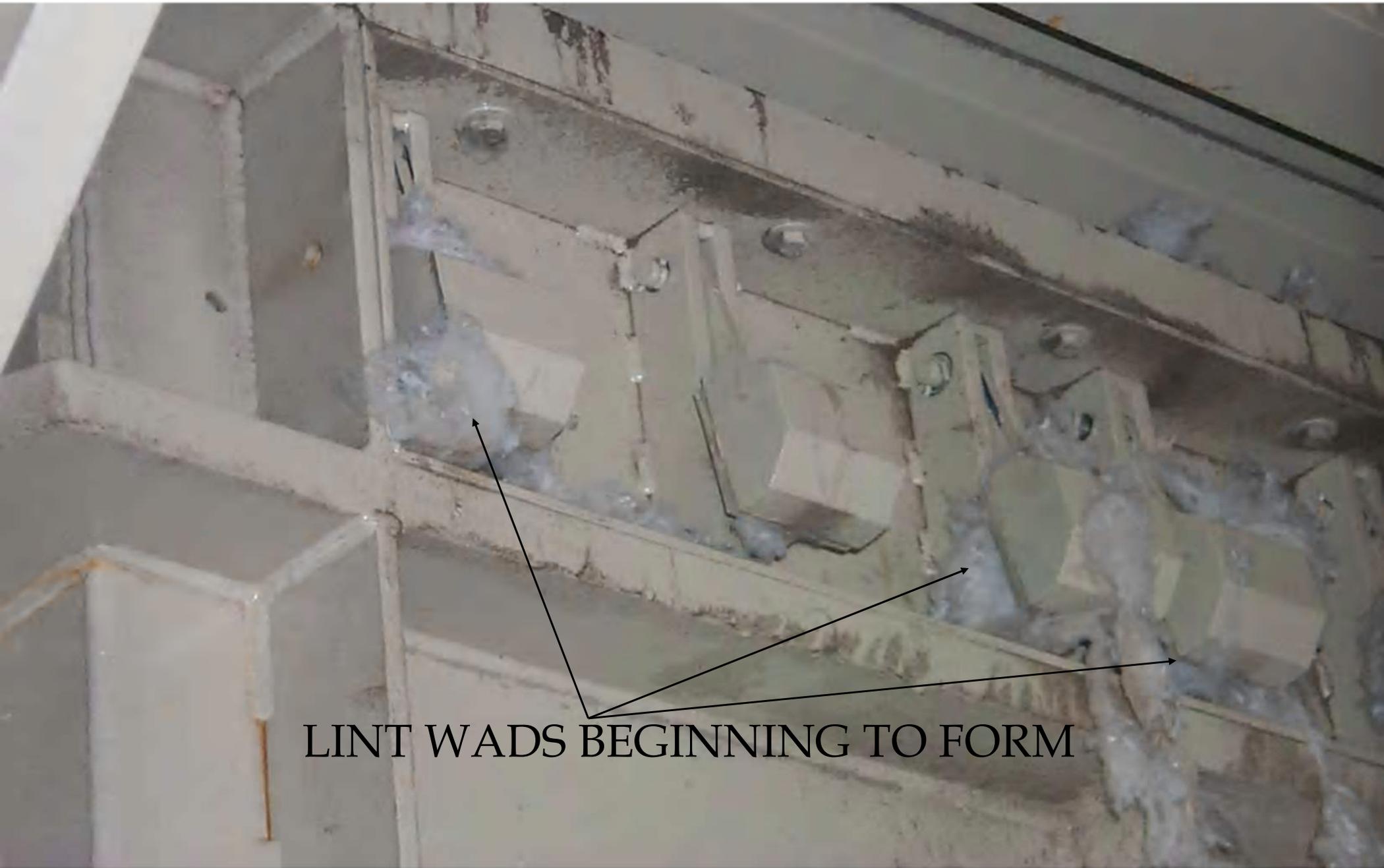
- Increases wear on press hydraulics, boxes and floor sleeves due to higher pressures.
- Causes lint to roll out from under Trampler and causes Press Dogs to malfunction.

# *Lint Moisture Content – Too High*

- Increases wear on press hydraulics and press boxes due to “Stiction.”

# *Press Dogs*

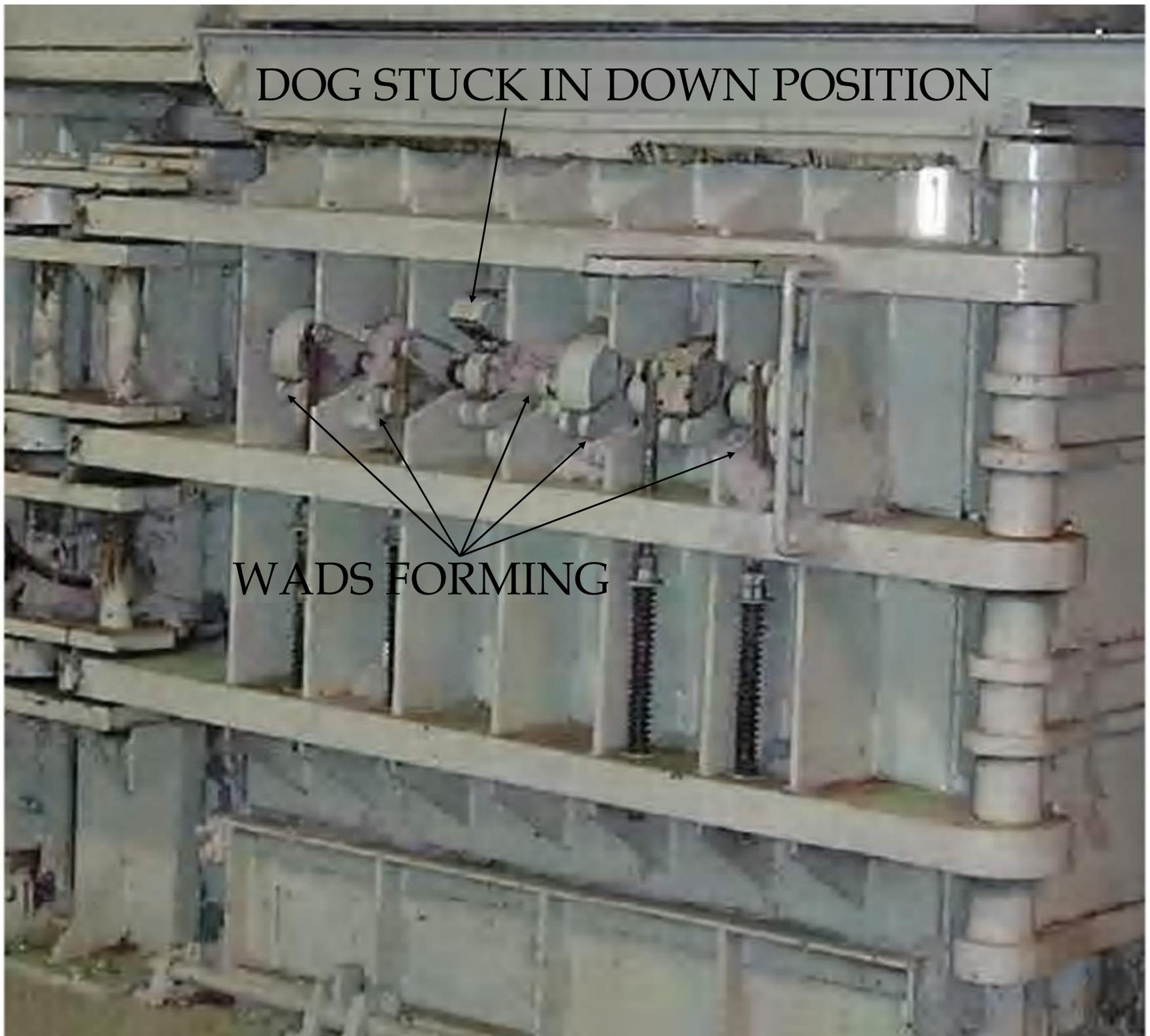
- Press dogs are a necessary evil on short box presses.
- Not unusual to see Dogs missing or inoperable due to lint accumulation or missing components.
- Unrestrained lint cotton tends to “boil” out of the press box creating tags and wads which can ultimately affect final bale shape.
- This is especially true when processing low moisture cottons.



LINT WADS BEGINNING TO FORM

DOG STUCK IN DOWN POSITION

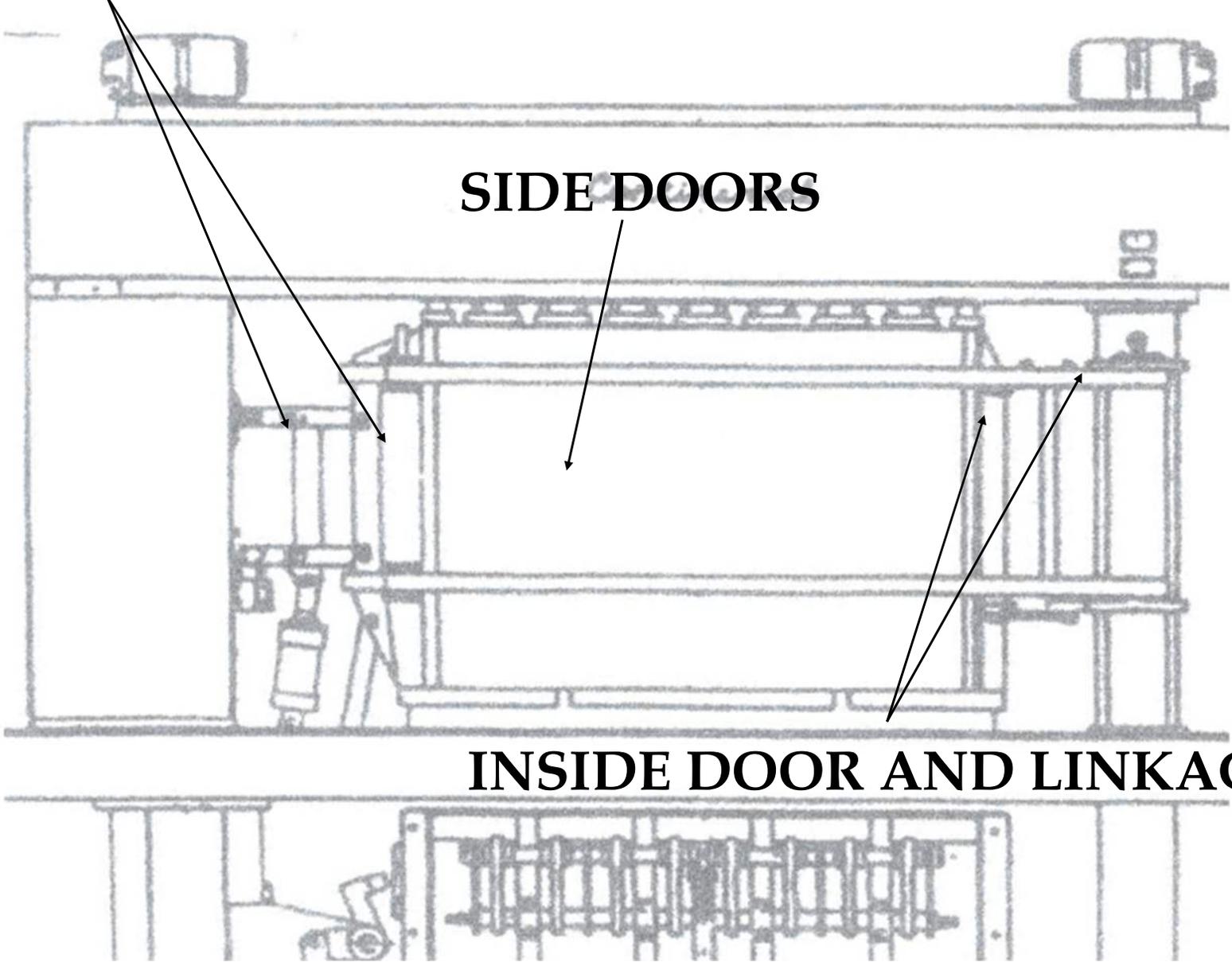
WADS FORMING



# *Compression Chamber Shape/Maintenance*

- ❑ Compression Chamber geometry has the greatest impact on final bale shape.
- ❑ Worn or Distorted Press Doors and worn Door Linkages are the cause of “wedge” shaped bales in Door type Presses.
- ❑ Oversized Floor Sleeves and “Lint Extrusion” are the causes of “wedge” shaped bales in Door-Less type Presses.

**END DOOR AND LINKAGES**



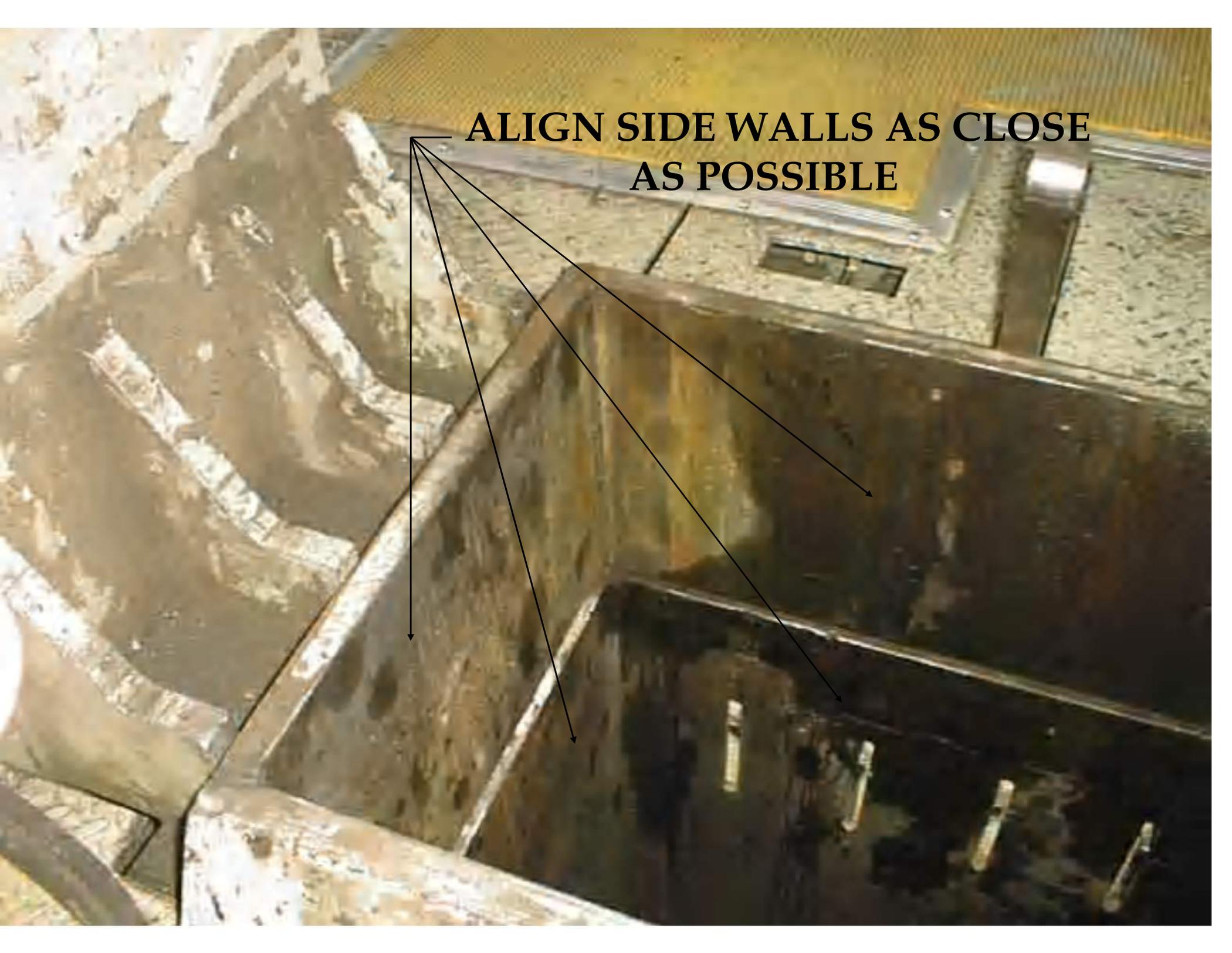
**SIDE DOORS**

**INSIDE DOOR AND LINKAGES**

# *Floor Sleeves*

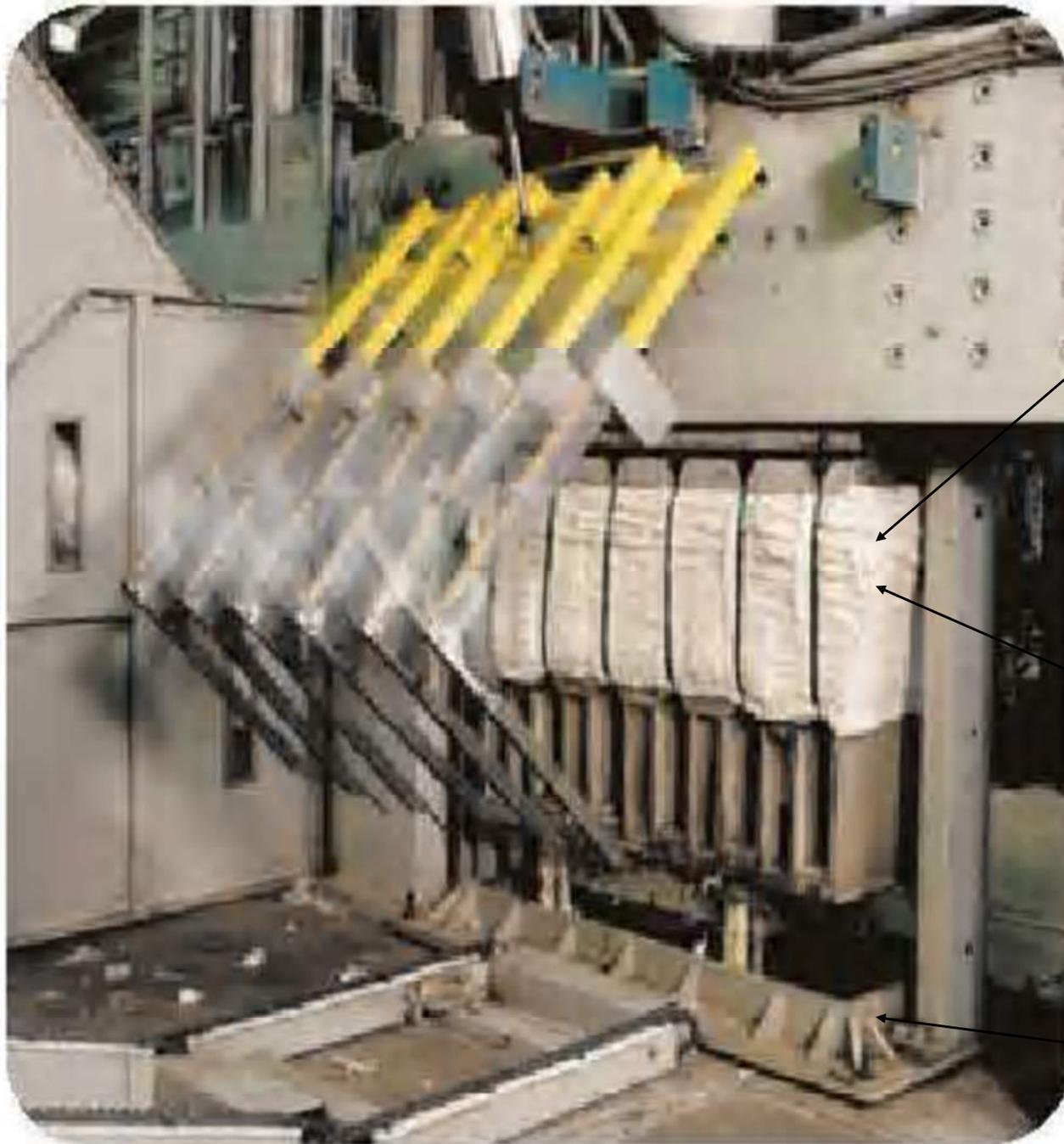
- ❑ Floor Sleeves are an extension of the Compression Chamber on up-packing door-less type Presses.
- ❑ The function of a floor sleeve is to accommodate automatic and semi-automatic tying systems on up-packing door-less Presses.
- ❑ Mis-alignment between the Press Box and Floor Sleeve can result in poorly shaped bales.
- ❑ Lint under compression “extrudes” through the gap between the top of the Compression Chamber and the bottom of the Floor Sleeve creating exaggerated folds at top of bale.
- ❑ Align inside of Floor Sleeve as close as possible with Press Box.

**ALIGN SIDE WALLS AS CLOSE AS POSSIBLE**



**LINT EXTRUSION DURING  
COMPRESSION TAKES PLACE  
IN THIS GAP**





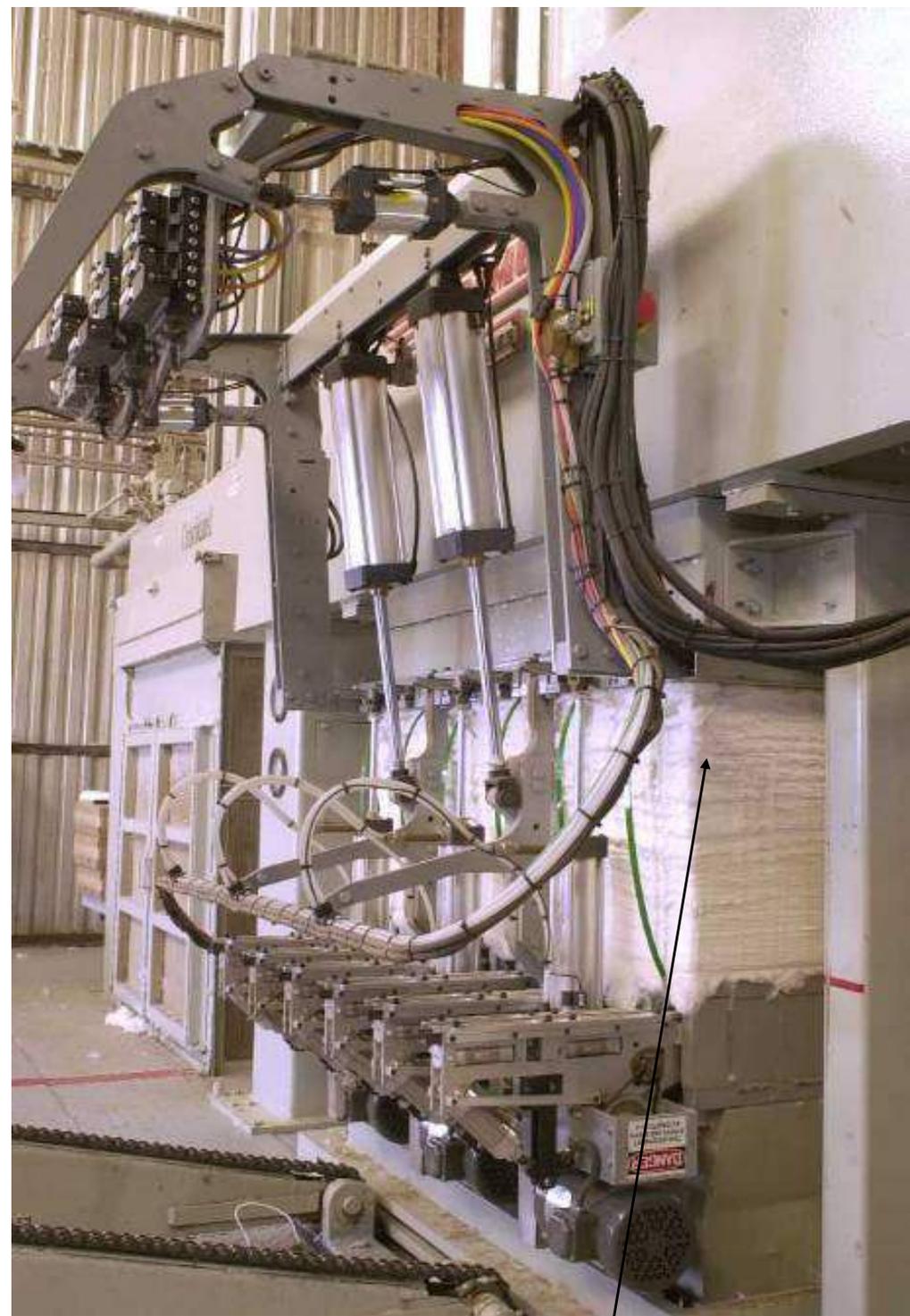
EXAGERRATED  
FOLDS

SLIGHT BULGE

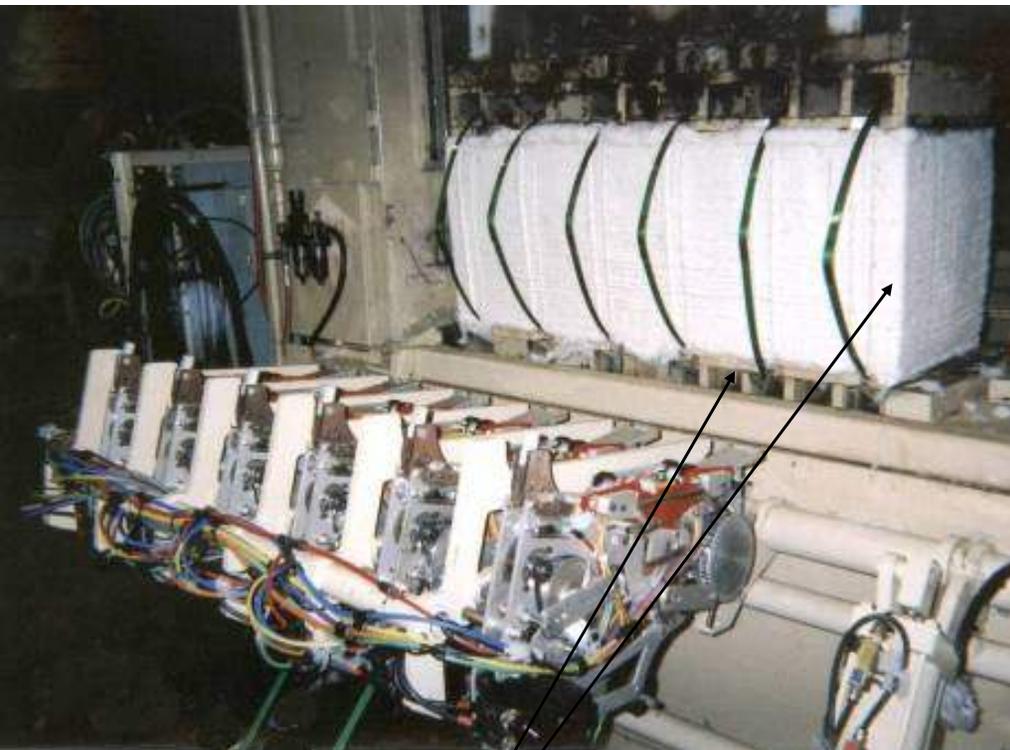
FLOOR SLEEVE



FLOOR SLEEVE



EXAGERRATED FOLDS



BALE WITH SHARP CORNERS AND NO FOLDS  
OR BULGES



FLOOR SLEEVE

FOLDS

BULGE

**DANGER**

THIS EQUIPMENT  
STARTS AND STOPS  
AUTOMATICALLY

**DANGER**

THIS EQUIPMENT  
STARTS AND STOPS  
AUTOMATICALLY



SLIGHT BULGE



NO FLOOR SLEEVE

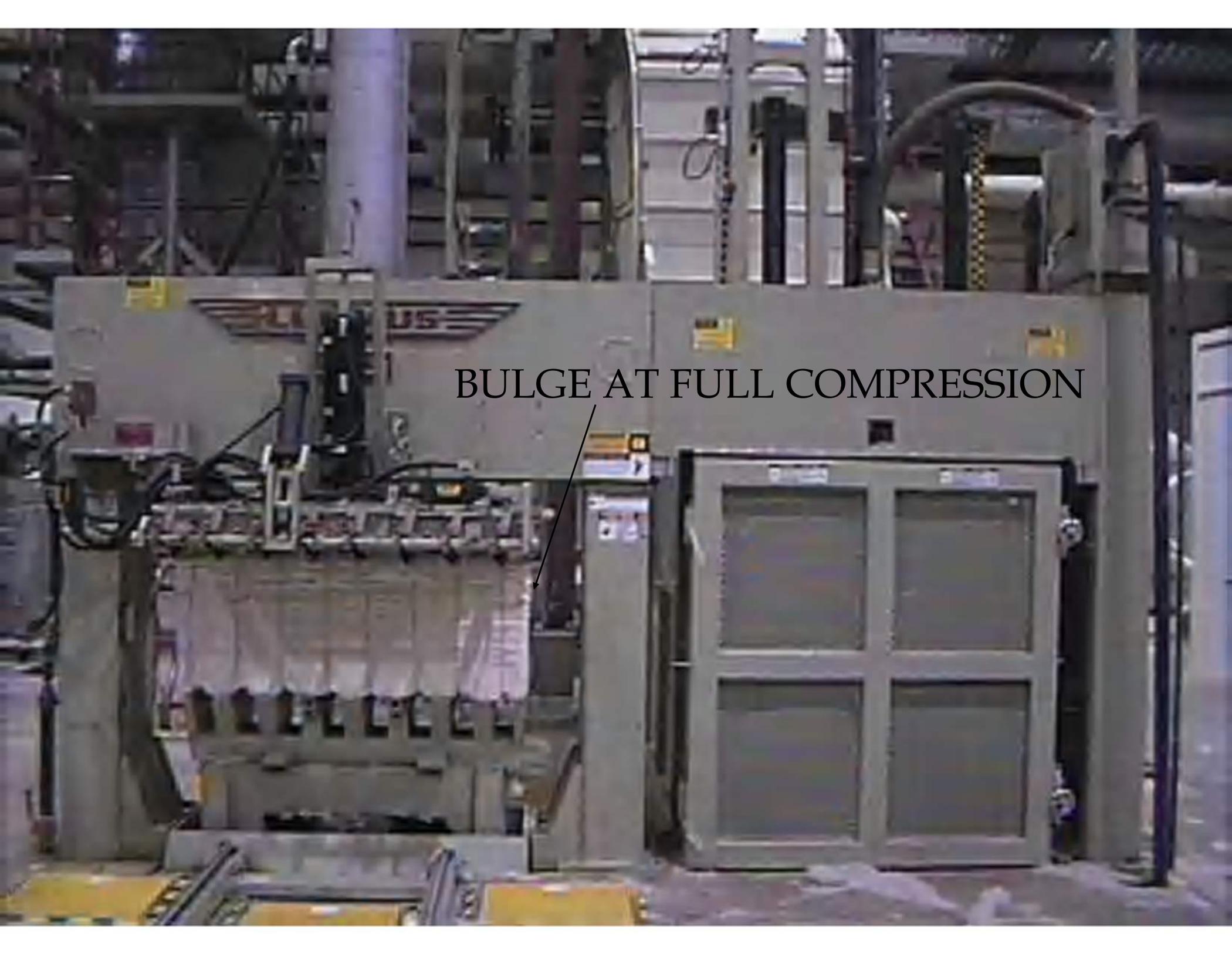


NO FOLDS

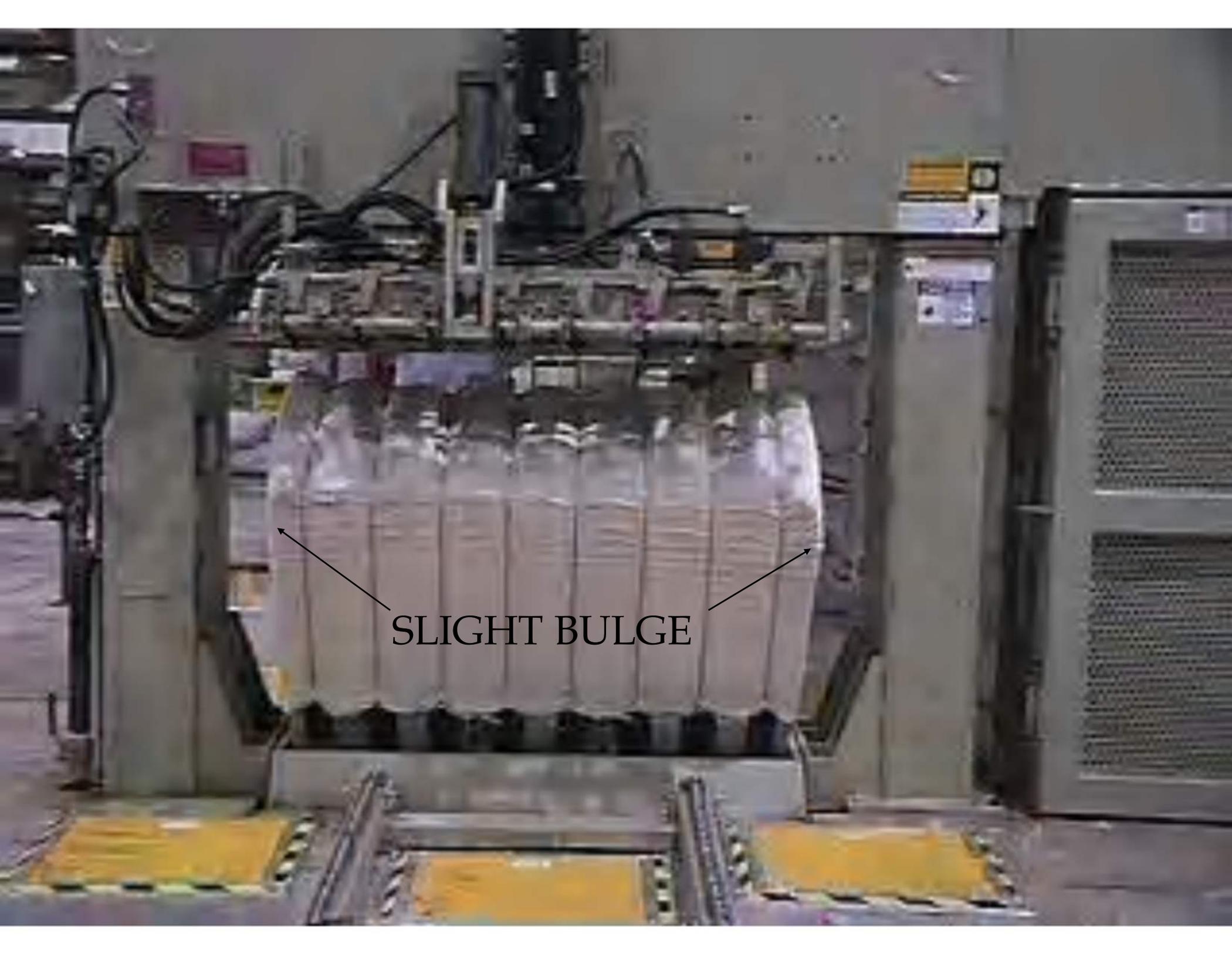








BULGE AT FULL COMPRESSION



SLIGHT BULGE

## *Extrude Pressure (door-less)*

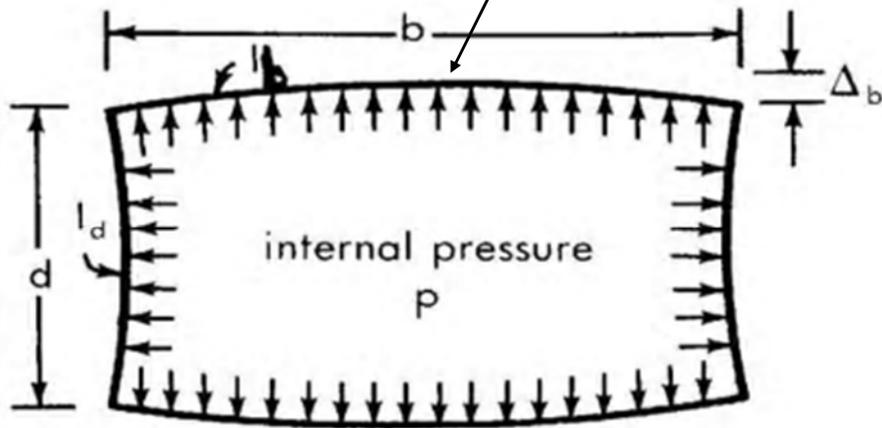
- Extrude pressure for down-packing presses is the pressure on the “blind” end of the Top Ram at which the Press Box is stripped off of the bale during compression.
- Extrude pressure for up-packing presses is the pressure on the “blind” end of the Top (opposing) Ram at which the Top Ram backs away from the Compression Chamber allowing the semi-formed bale to extrude from the Press Box.

## *Extrude Pressure (door-less)*

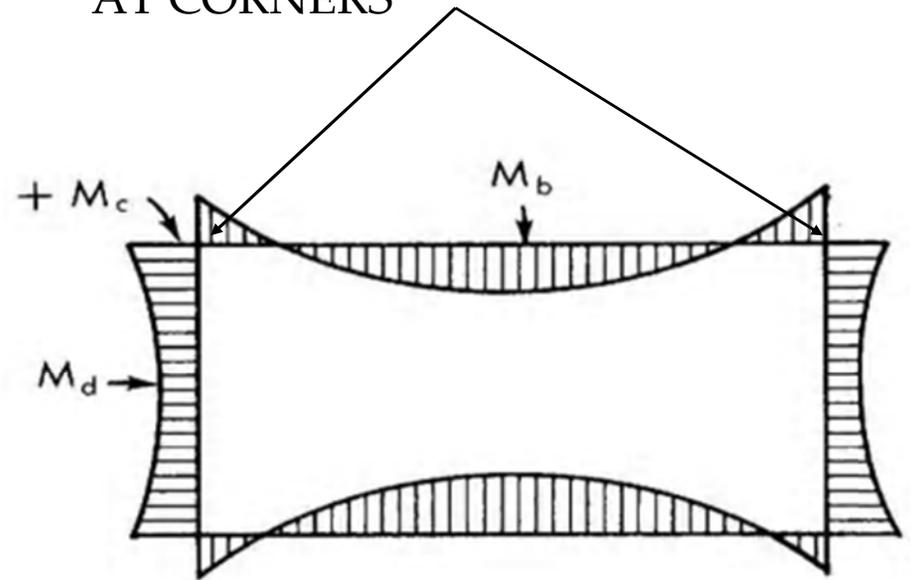
- Extrude pressure that is too low can lead to mis-shaped bales.
- Extrude pressure that is too high creates undue wear and tear on the press box, floor sleeve and hydraulic system.

# Compression Chamber Schematic

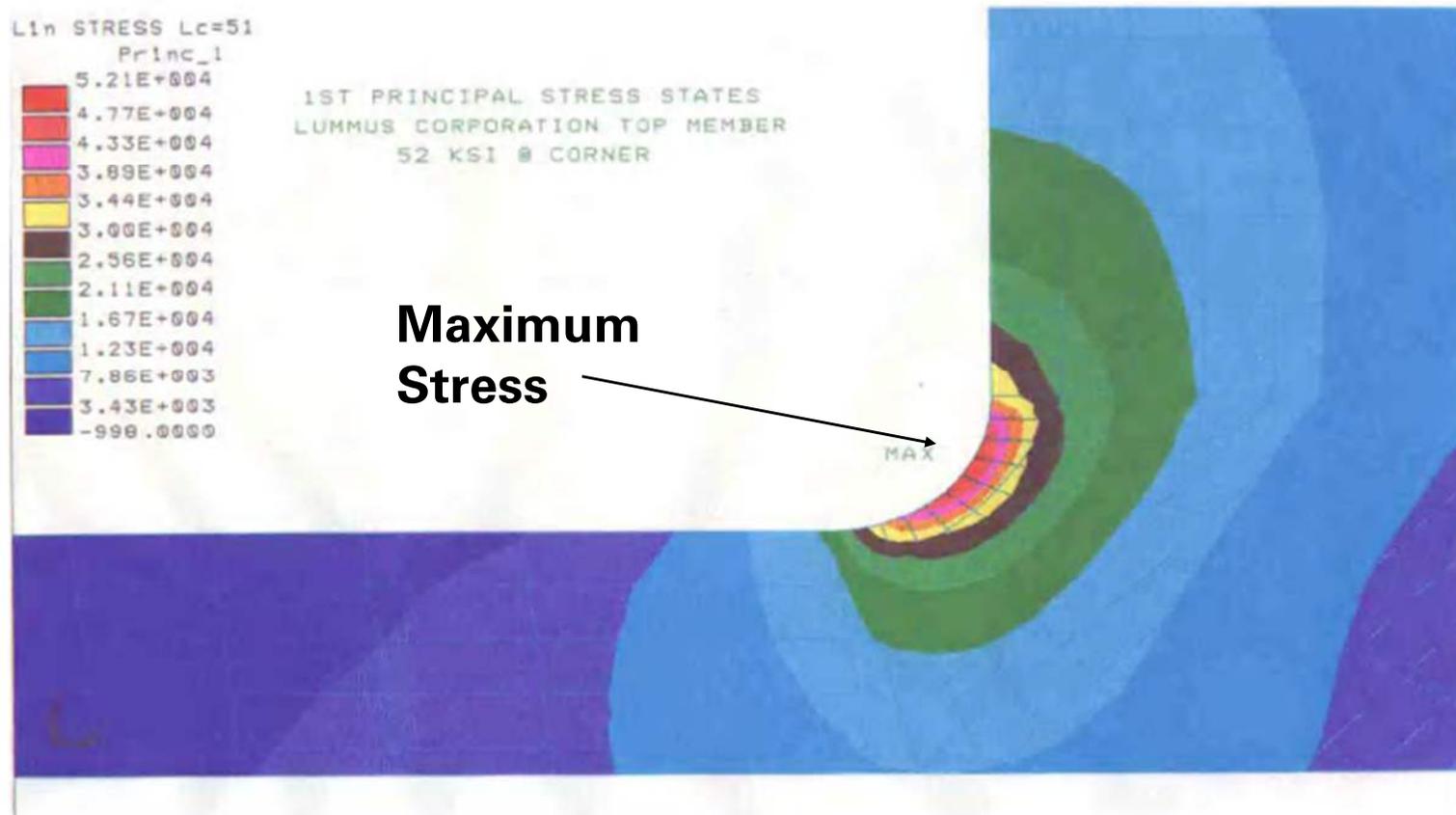
STRAIN GAGE LOCATION  
AT CENTER



INITIAL FAILURE OCCURS  
AT CORNERS



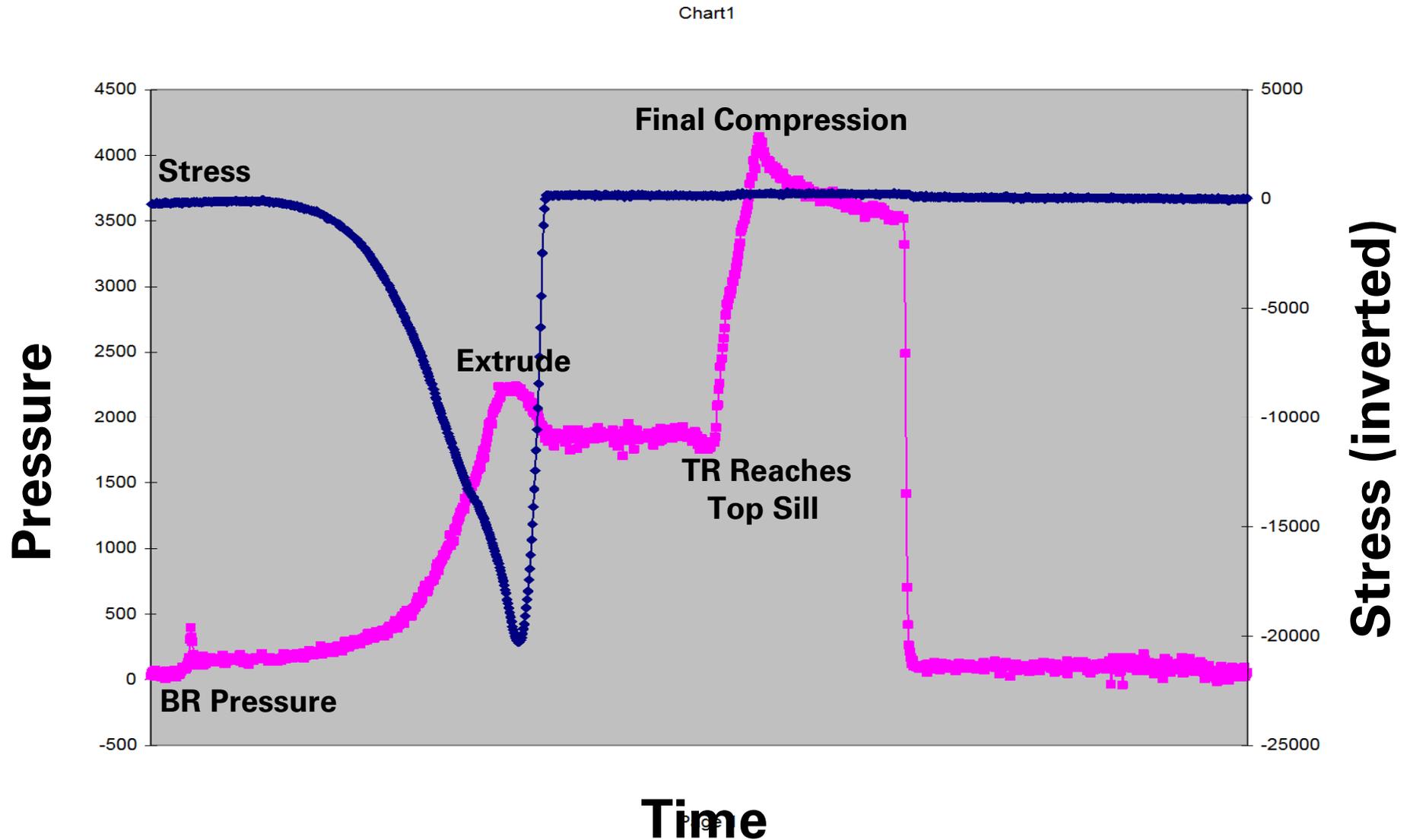
# Compression Chamber Corner Stresses



Plot C – Original Design – 1<sup>st</sup> Principal Stress – Psi

Source: Culler, Barry, MCAE Technologies - 108 Little Ridge - Duluth, Georgia 30096

# Bottom Ram Pressure vs. Box Stress



## *Follow Block Configuration*

- ❑ Missing, Worn or Improper fitting Follow Block Guides lead to mis-shaped bales.
- ❑ Turn-ups on the ends of Platen Bars help keep strapping guide tracks clear but contribute to poor bale shape.
- ❑ Excess clearance between edge of Follow Block and Press Box allow Follow Block to move causing poor bale shape during compression. ( $\frac{1}{4}$ " is adequate clearance)