How Ball Makes Beverage Ends

From a shell to an end...

1. **COIL STAGING AREA**
   - Aluminum coils are positioned by forklift on the unender and transferred to the coil car. The coil car moves the coil into position on the uncoiler.

2. **UNCOILER**
   - Unwinds the aluminum coil stock and feeds it into the pinch roll stand. Ball uses pre-coated, pre-lubricated coil stock.

3. **PINCH ROLL STAND**
   - Straightens the coil stock and controls the coil "loop" as coil stock enters the shell press.

4. **SHELL PRESS**
   - In a two-step operation, the shell press punches out circular blanks and then forms them into "uncurled shells." Shells exit the shell press and go to the curlers.

5. **CURLERS**
   - The curler reforms the lip around the edge of the shell, curving it inward to form a channel for the sealing compound, which is applied at step 8.

6. **END BALANCER #1**
   - The balancer is a mechanical "sponge" which controls the flow of shells between the shell press and multiple compound lining machines. The balancer also accumulates excess shells from the shell press to help keep downstream equipment running during momentary stops for coil changes, cleaning, etc. From the balancer, the shells are conveyed to the compound liners.

7. **COMPOUND LINERS**
   - The compound liners apply sealing compound into the channel of the shells.

8. **VISION INSPECTION SYSTEM**
   - The shells exit the compound liner on a flat-belt conveyor and pass under the camera of the vision inspection system. The shells are being inspected for proper application of the sealing compound.

9. **LINER OVEN**
   - The lined shells are briefly exposed to heated air, which cures the water-based lining compound.

10. **END BALANCER #2**
    - Balancer #2 helps keep the production flowing smoothly from one process to the next. The lined shells exit the balancer and are conveyed to the conversion press.

11. **CONVERSION PRESS**
    - This press contains multiple "progressive" die sets which raise a "rivet" in the center of the shell (for eventual application of the tab), scores the opening, applies lettering, and forms the tab that is applied to the prepared "rivet".

12. **VERTICAL TAB STOCK UNCOILER**
    - The vertical tab stock uncoiler feeds a narrow strip of plain metal into the conversion press to produce the tabs used during the conversion process.

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14. **BAGGING STATION**
    - Here the ends are counted and inserted into paper-tube sacks or "bags".

15. **PALLETIZER**
    - The bags are loaded onto a pallet and paper wrapping is woven through the bags to secure them.

16. **STRETCH WRAPPING STATION**
    - Where the entire pallet is stretch wrapped with thin plastic film.

17. **TRANSFER TO WAREHOUSE**
    - Palletized ends are transferred to warehouse by forklift.