

| Packaging purposes | |
|----------------------|--|
| Purpose | • Physical protection • Barrier protection • Containment or agglomeration • Information transmission • Marketing • Security • Convenience • Portion control |
| Types: | • Primary, the material that holds and contains the product • Secondary, the material outside the primary packaging, often used to group primary packages together • Tertiary and packaging systems, the material used for bulk handling, warehousing and transportation |
| Primary contains: | Bottles, cans, kegs, casks [immediate and future consumption, can be one-use or refillable] |
| Closure: | Single opener, resealable, functions as dust cover and tampering seal |
| Secondary packaging: | Enable tertiary packaging • Protect primary packaging against damage during transport and distribution • Provide handy clusters easy and convenient for consumers to handle • Promote the products towards customers and consumers |
| Tertiary: | Pallets |
| Inspections: | neck, sidewall, inner sidewall, base, bottle colour, caustic/residual liquid, scuffing |

| Preforms, PET | |
|-------------------|--|
| Onestage | PET pre-forms are produced and blown into finished bottles in the same machine. |
| Two-stage process | PET pre-forms are produced and stored in containers. One advantage is that the pre-forms take up less space than the finished bottles. |

| Berg's Capacity - V! | |
|----------------------|---|
| Concept | Make sure the filler is the slowest part to ensure no holdups |

| Filling | |
|------------------|---|
| Main focus: | Avoid beer loss Ensure nominal fill Avoid contamination, prevent air and oxidation, avoid CO2 loss |
| Types of filling | Counter pressure (Level filling, Volumetric filling[Metering chamber with transsonar level probes]) Gravity filling Mechanical valve (Conventional), Electro-pneumatic valve |
| When to do what: | Level filling • Returnable and non-returnable glass bottles • Returnable PET bottles (regardless of size) • Small diameter containers Volumetric filling • Dimensional accurate containers • Large diameter containers (in neck area) • Nontransparent containers • Typically: High quality one way plastic bottles and cans of larger volumes |

| Pasteurisation | |
|----------------------|---|
| PU | 1 PU is 1 minute at 60°C . |
| Formula | $PU = t * 1.393^{(T-60)}$ |
| Flash Pasteurisation | Beer is heated in a plate heat exchanger, held at 68–72°C for 30–50 sec, then cooled down again |

| Labelling | |
|-----------|----------------------------|
| Types | Cold glue vs self adhesive |