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r□□ r□□@▲?□r□□□v?8? L€?¶□M€ ?3 簋蚌蕘;?竟蕘;r□?g? ?4KdKd P?z[0揀 ? r!!p?
p p? @ \ ? ? ? Packaging Materials? ? ? C. A folding
carton that absorbs moisture from the atmosphere or has irregular flaps can cause the machine to jam
or tear the carton; D. An adhesive containing too much solvent may require additional drying time;
E. A lightweight bottle that topples over will stop or jam the machine. ?

r q @ 0 ? ? ? Machine Capabilities ?
? ??1. Speed A packaging line cannot be expected to produce an operating speed or deliver
a quality of package that exceeds the capability of any of the machines in the line The limitations
of the line are determined by the slowest or least-accurate machine in the line; Each packaging
machine is designed to operate most effectively within a particular speed range, with particular
types of products, and under given sets of conditions. ? ? ? ? Machine
Capabilities? ? ??2. The Machines in a Packaging Line How to Select: to handle the

product, containers, and packaging material Speed versatility adaptability adjustability Accuracy
dependability to forgive being misused Integrated by conveyors, control units, and timing
mechanisms; Some lines operate all the machines from a common power source; Other lines use machines
with independent power sources; ?1\$ P P P P3 ? ? ? Machine
Capabilities? ? ?Some machines may perform functions that have unique power requirements
including 440 V, 220 V, 3 Phase, and DC electrical power; Machines may require specific compressed
air pressure for operating machine components or controls. ? ? ? ? Line Balancing ?

? ??Definition: The line must be balanced and timed so that machines will operate as
one integrated unit; Timing the line sets all the machines to run at the same or compatible speeds,
and it starts and stops each operation at the proper time; When one machine is running too fast,
excess product backs up down the line. When a machine is too slow, the line backs up, and machines
down the line do not receive enough product; ? ? ? ? Line Balancing?

? ?Z How to Balance a Line: Selecting the machines and/or adjusting the speeds and
starting times so that they operate together to produce a smooth flow; Conveyors, accumulators, and
feed control systems can be used to store excess production and compensate for unevenness in the
flow when one of the machines is shut down for short periods of time. ? : C A ?

? ?' Material and Container Characteristics? ((? ??1. Converters: Many packaging
materials and containers are prepared for the packaging line by the converters who supply the
material; Converters are companies that combine and process materials to make them ready for use on
the packaging line; [For example] The converters 1. laminate film, foil, or other web materials,
apply protective coatings, and print them ready to load onto a machine that makes pouches for
packaging a particular product; ?x P P P P P ? ? ?
Material and Container Characteristics? ((? ?0 2. convert corrugated board into knock-down
cases and convert paperboard into folding cartons; 3. print labels and decorative designs on them;
4. coat, laminate, and print webs of wrapping material; 5. print rolls of labels; 6. perform many
operations involved in producing packaging materials and containers used on the packaging line. ?

P ZP ? ? ?' Material and Container Characteristics? ((? ??2. Container
Characteristics Selecting a new container or changing the design of an existing one can have several
effects on the operation of the machinery in a packaging line. When the container design is changed,
the following should be considered: Cost Speed Quality [For example] Changing a syrup container from
a round can with a center neck to a rectangular can with the opening at one end may produce a
package that is more attractive / easier to use / increase sales?

P P; P P5 P % 1 ? ? ?' Material and
Container Characteristics? ((? ??However, it can also result in a more expensive container
that is difficult to orient on the line / reduces machine speeds increases spillage / requires
purchasing a new labeler That is, it may be a very advantageous change, or it may cost more than it
is worth. Failing to consider all the variables that are operating in a packaging line can result in
undesirable decisions. Container Characteristics That Affect Machine Operations: variability in size
smoothness of the lips rigidity of a folded carton shape of containers positions of pouring spouts
positions of handles weight of the container? ? P P : ? ? ?

