Catalyst Safety

in the Workplace

by

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Maskell Productions, October 2017

Campbell Composites

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You need to know about:

1. Material Safety Data Sheets (MSDS)
2. Dangerous combinations
3. Storage
4. Protecting Yourself
5. Spills
6. Containers & Labeling
7. Fire
8. Disposal

… and Dosage

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Material Safety Data Sheets (MSDS)

- WHERE are the MSDS?
- Ask for an explanation if needed
- Maximum Storage Temperature
- First Aid
- Transportation

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Dangerous Combinations

- Catalysts must always be kept away from strong reducing agents:
  - Amines, strong Acids, Alkalines, & heavy metal compounds such as iron/rust, brass, copper, cobalt, etc.
- Never mix Acetone with catalysts
- Never clean catalyst equipment with Acetone
- Dilution and blending of catalysts should NEVER be done by the end user without CERTIFIED technical support.

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Organic Peroxide Label

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Storage

Is this really important???????

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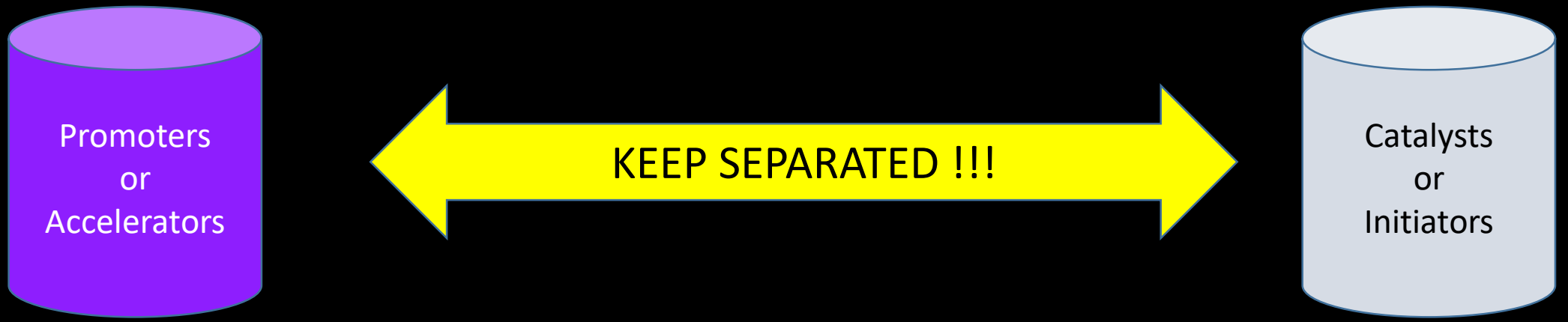
Storage

- Separation from other chemicals



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Storage

- Separation from other chemicals
- Like stored with like

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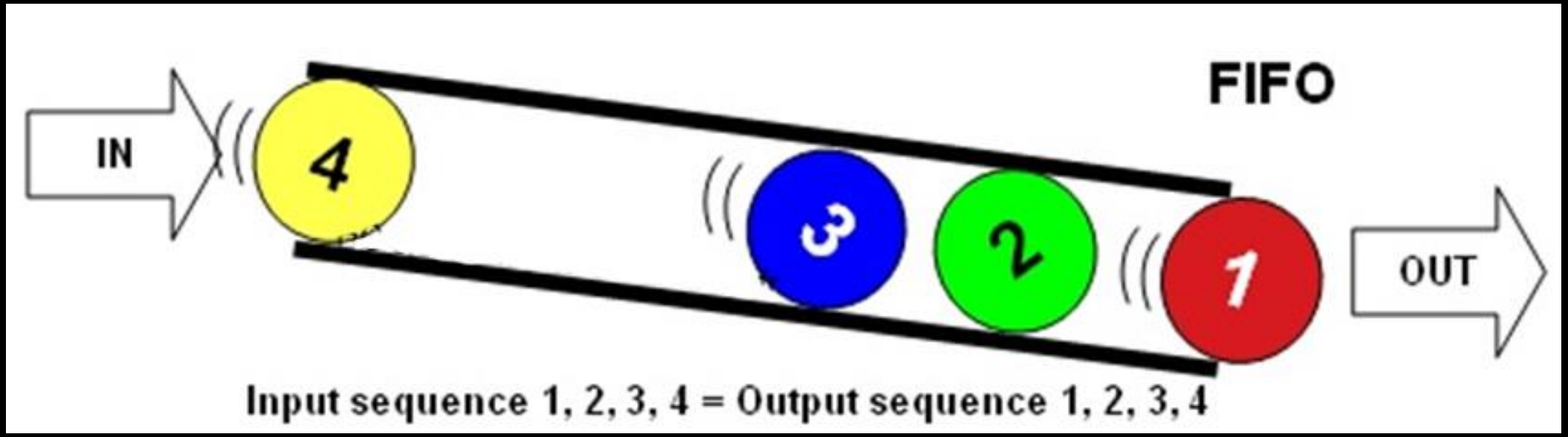
Storage

- Separation from other chemicals
- Like stored with like
- First-in First-out (FIFO)



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Storage

- Separation from other chemicals
- Like stored with like
- First-in First-out (FIFO)
- Maximum storage temperature (28° C)

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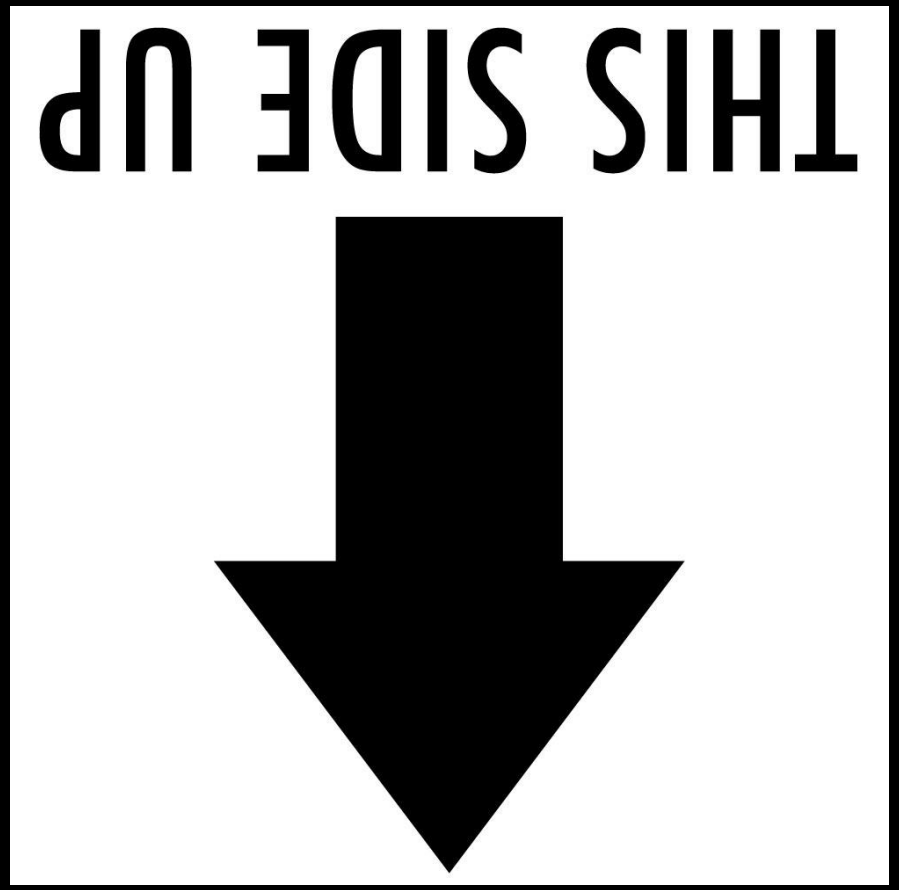
Storage

- Separation from other chemicals
- Like stored with like
- First-in First-out (FIFO)
- Maximum storage temperature (28° C)
- Arrows on carton



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Storage

- Separation from other chemicals
- Like stored with like
- First-in First-out (FIFO)
- Maximum storage temperature (28° C)
- Arrows on carton
- Date of manufacture

Batch Number: 654321

Represents:

- 201**6**
- May (the **5**th month)
- Batch **321**

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Protecting Yourself

- Wear appropriate gloves & eye protection
- Close containers when not decanting
- Decant in designated area when available
- No eating or drinking within the workplace
- Personal cleanup and first aid
- Report incidents and near-misses

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Spills

1. Where is the closest Spill Kit???
2. Move the kit to the spill.
3. Do the darn Spill Kit steps!!!!

(hint: carefully hidden inside the lid)

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Containers and Labeling

- DOs:
  - Use only virgin containers (made from PE, PP, or Teflon)
  - Use only stainless steel (clean & passivated), catalyst compartment in spray equipment
  - Correctly label all catalyst containers… both:
    - Full
    - Decanted
  - Replace damaged labels
  - Keep the container tightly capped

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Containers and Labeling

DO NOT
use glass containers !!!

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Containers and Labeling

DO NOT

pour back into original container !!!

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Fires

See the Safety DVD section on

“How to Fight Catalyst Fires”

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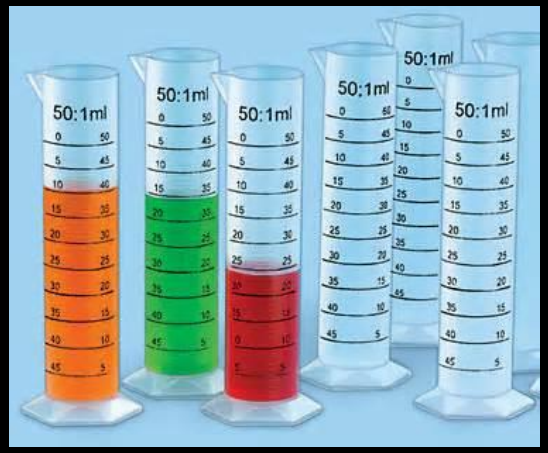
And one more thing …



Dosage

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What makes the level of catalyst that we use in the factory?

- Change in gel time from one batch of resin or Flow Coat to the next

- Change in the air temperature. The best temperature to manufacture fiberglass components is between 15° to 35° Celsius.

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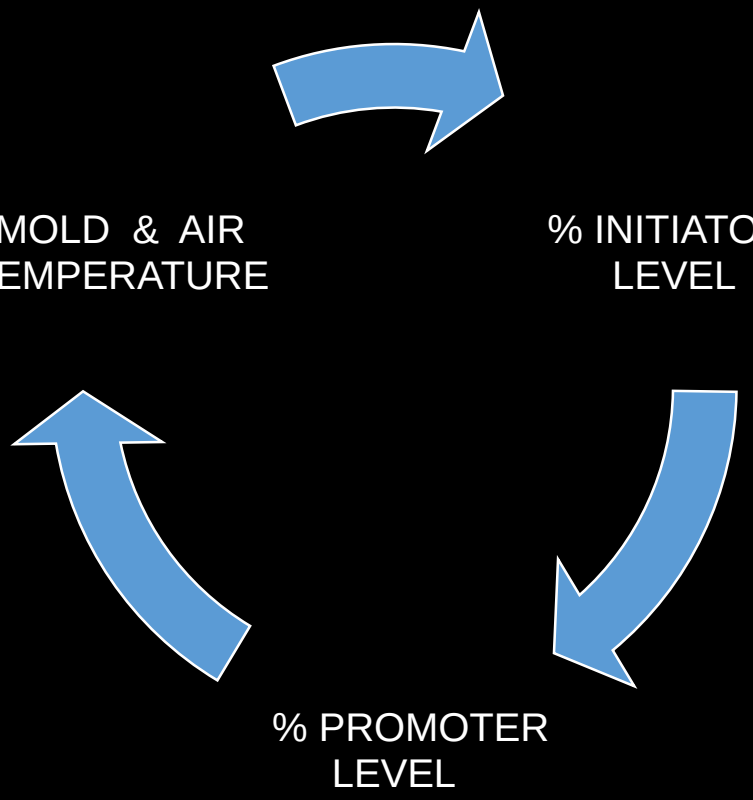
Factors Effecting Flow Coat & Resin Cure



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The “10 Degree Celsius” Rule

For every 10° C change in mold and air temperature, the gel time will:

- DOUBLE when decreased
- HALVE when increased

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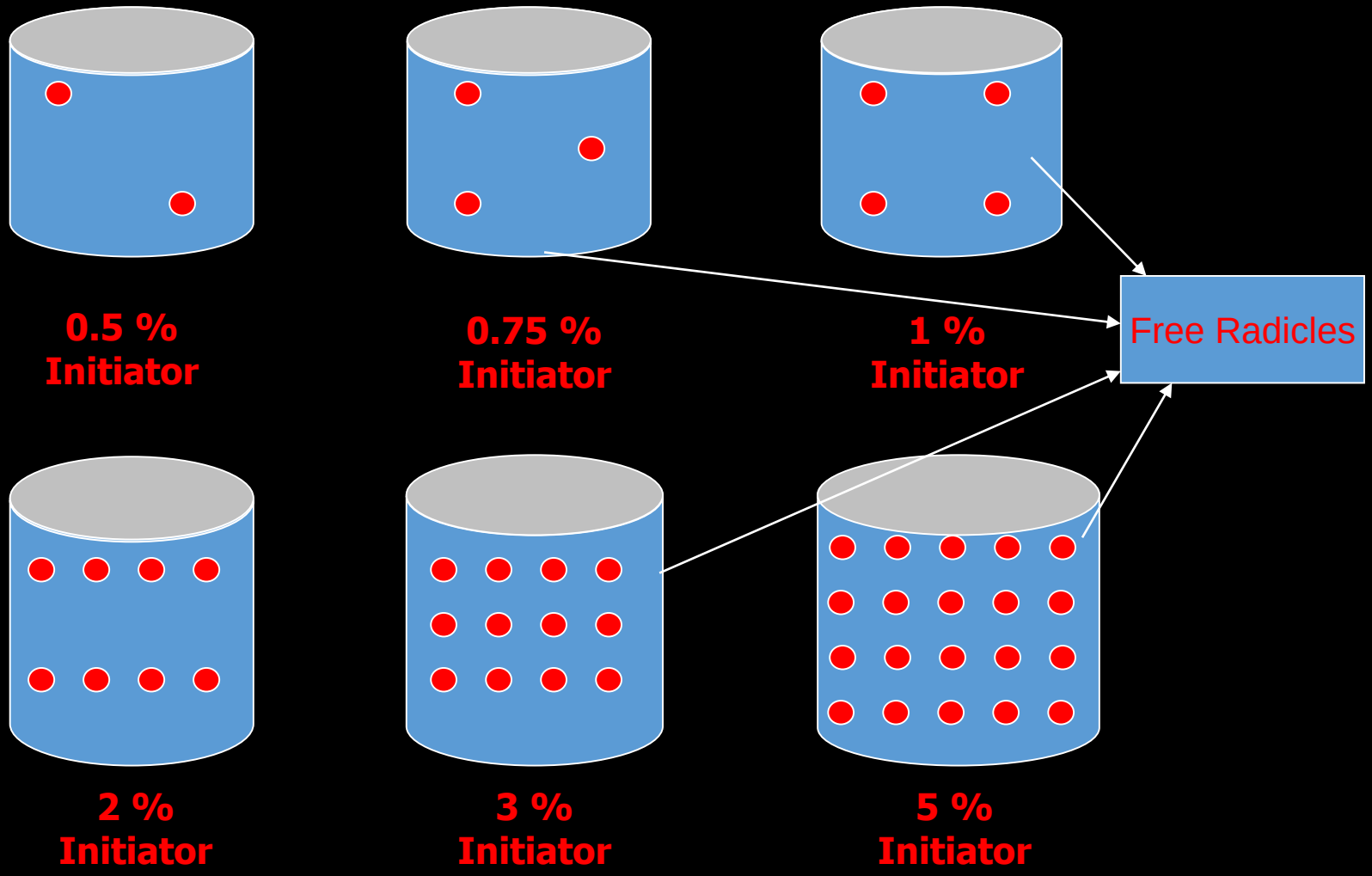
UNDER/OVER CATALYZATION

There are close to 5 million cross linking sites in 4 kilograms of resin



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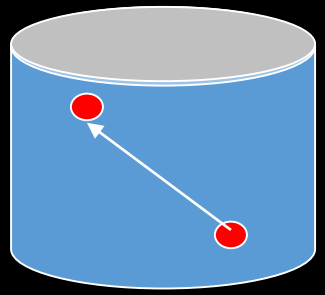
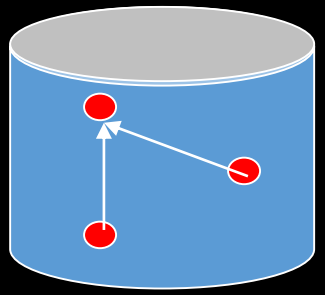
UNDER/OVER CATALYZATION



0.5 % Initiator



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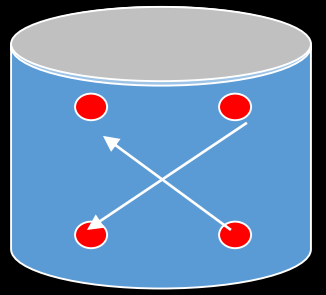

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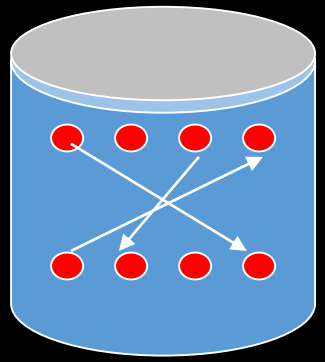
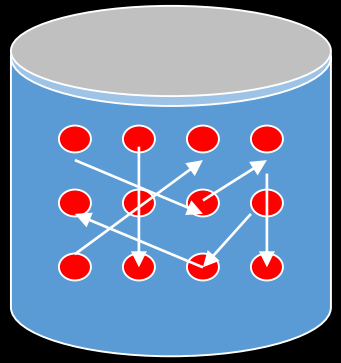
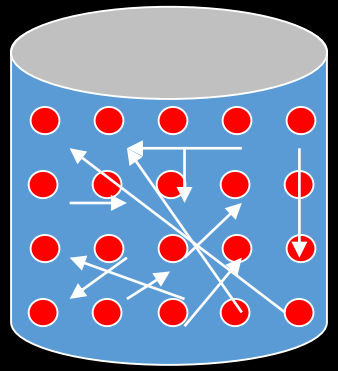


2 % Initiator



3 % Initiator



5 % Initiator

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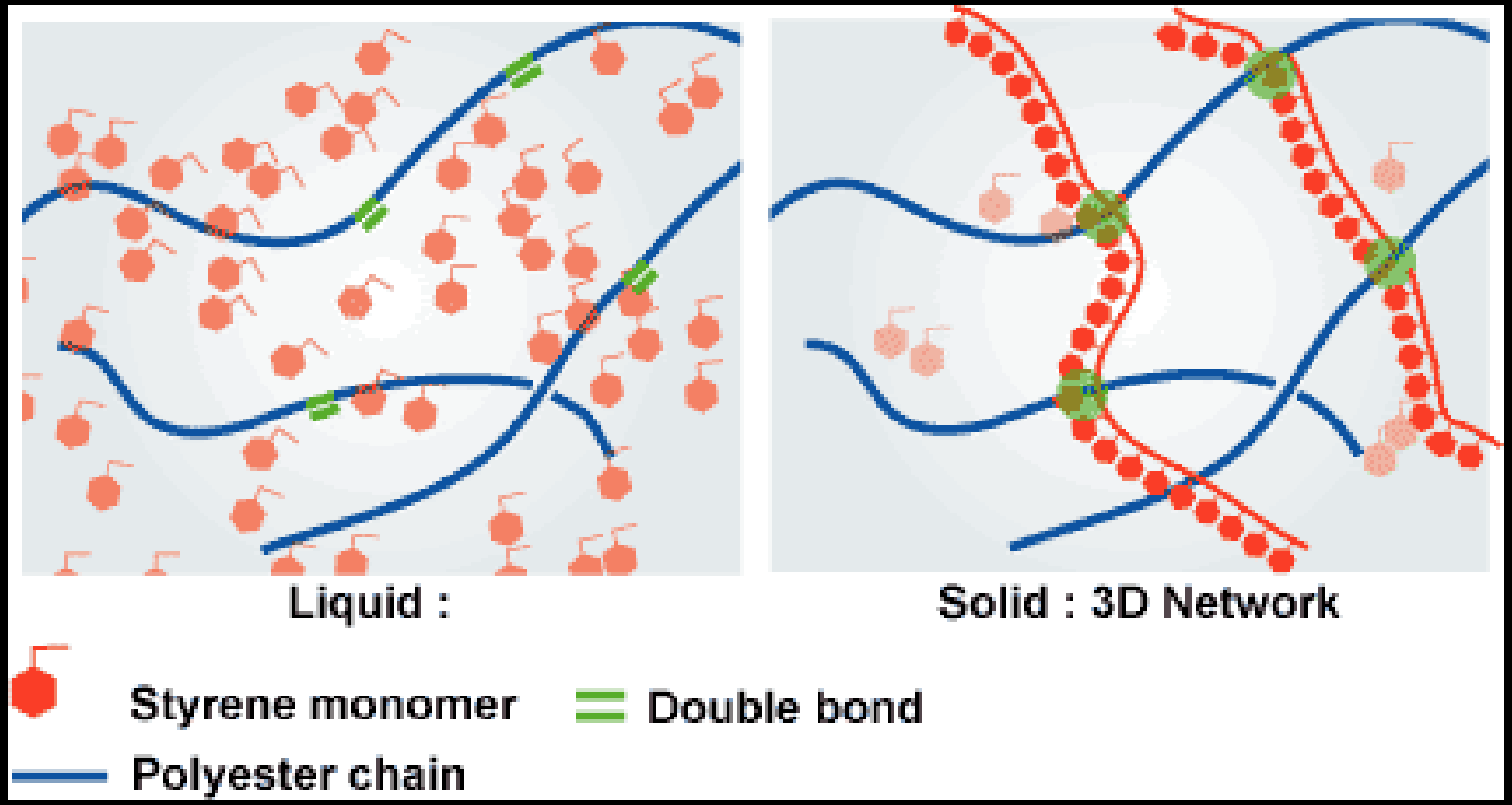
Unsaturated Polyester Structure

Structure of liquid and solid phase of unsaturated polyesters



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Flow Coat Faults- UNDER Catalysation

- Alligatoring/Wrinkling
- Sagging or Running (when Flow Coat is applied too thick)
- Dull Parts/Softness (poor mixing)
- Premature Yellowing
- Premature Chalking
- Fading of Colour

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Flow Coat Faults – OVER Catalysation

- Delamination
  (combination of high Initiator levels and too high Flow Coat film build)
- Porosity
- Chalking
- Dull Parts

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Resin Laminating Faults – UNDER Catalysation

- Low Mechanical Strength
- Reduced chemical resistance
- Shrinking/Warping (after part has been pulled)
- Soft Spots

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Resin Laminating Faults – OVER Catalysation

- High Exotherm
- Resin Cracking
- Hot Sports
- Shrinkage
- Poor Wet Out
- Air Bubbles
- Low Mechanical Strength
- Delamination

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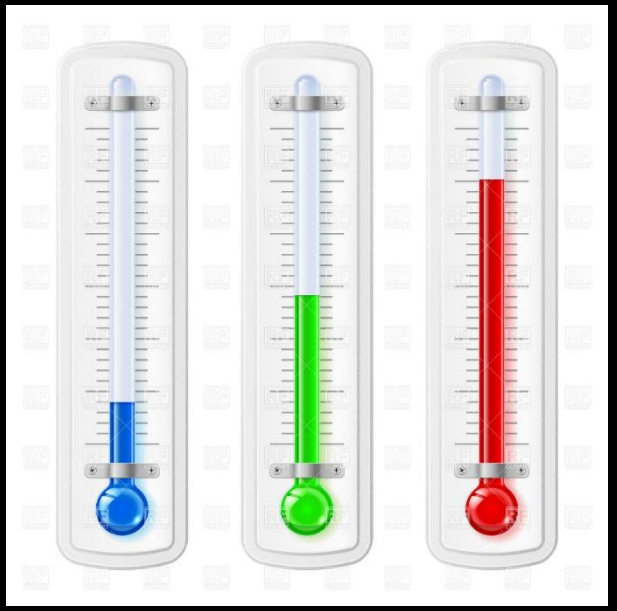
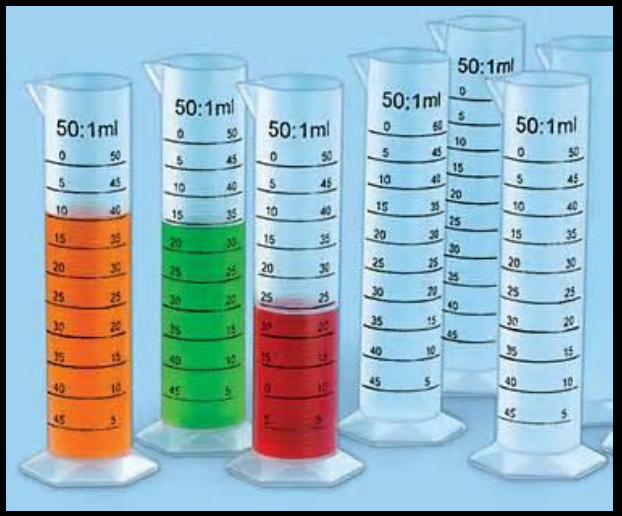
What does this all mean?

Dosage

Use within the correct range!





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