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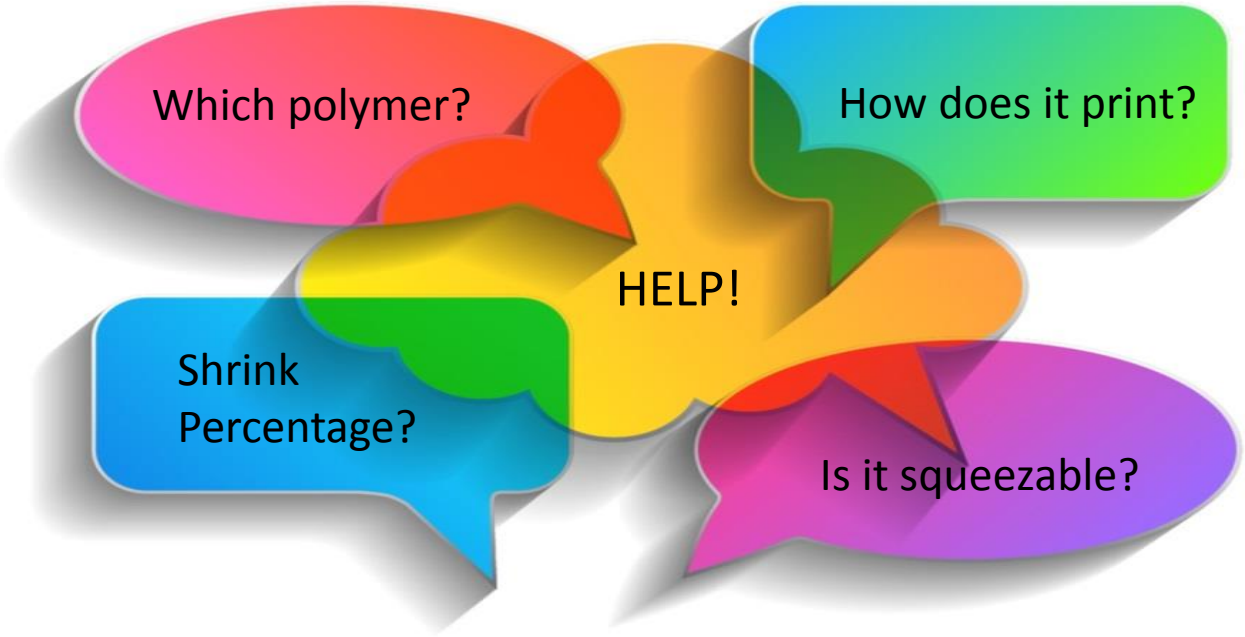
klöckner pentaplast

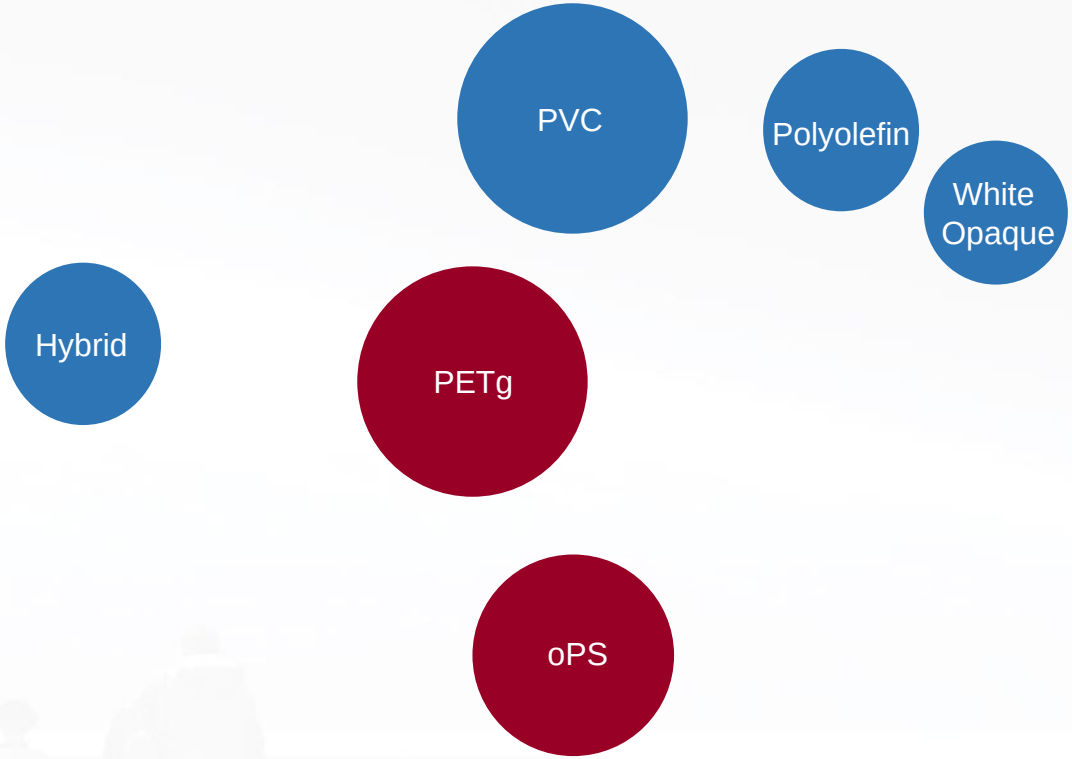
25 - 27 September · Chicago
LABELEXPO
AMERICAS 2018
www.labelexpo-americas.com

Choosing The Right Label Substrate Can Be Confusing

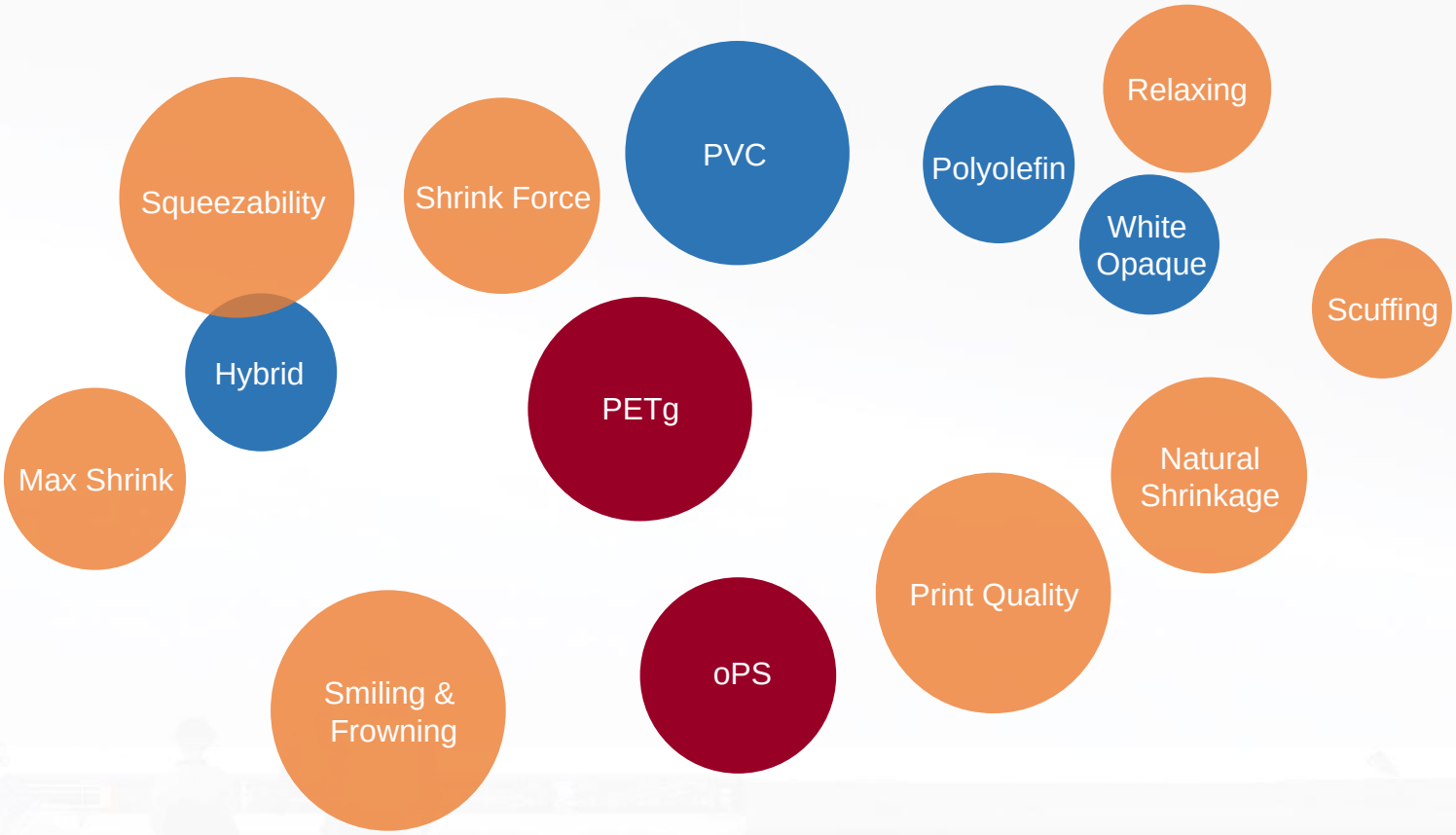
Why? Because There Are Many Variables To Consider



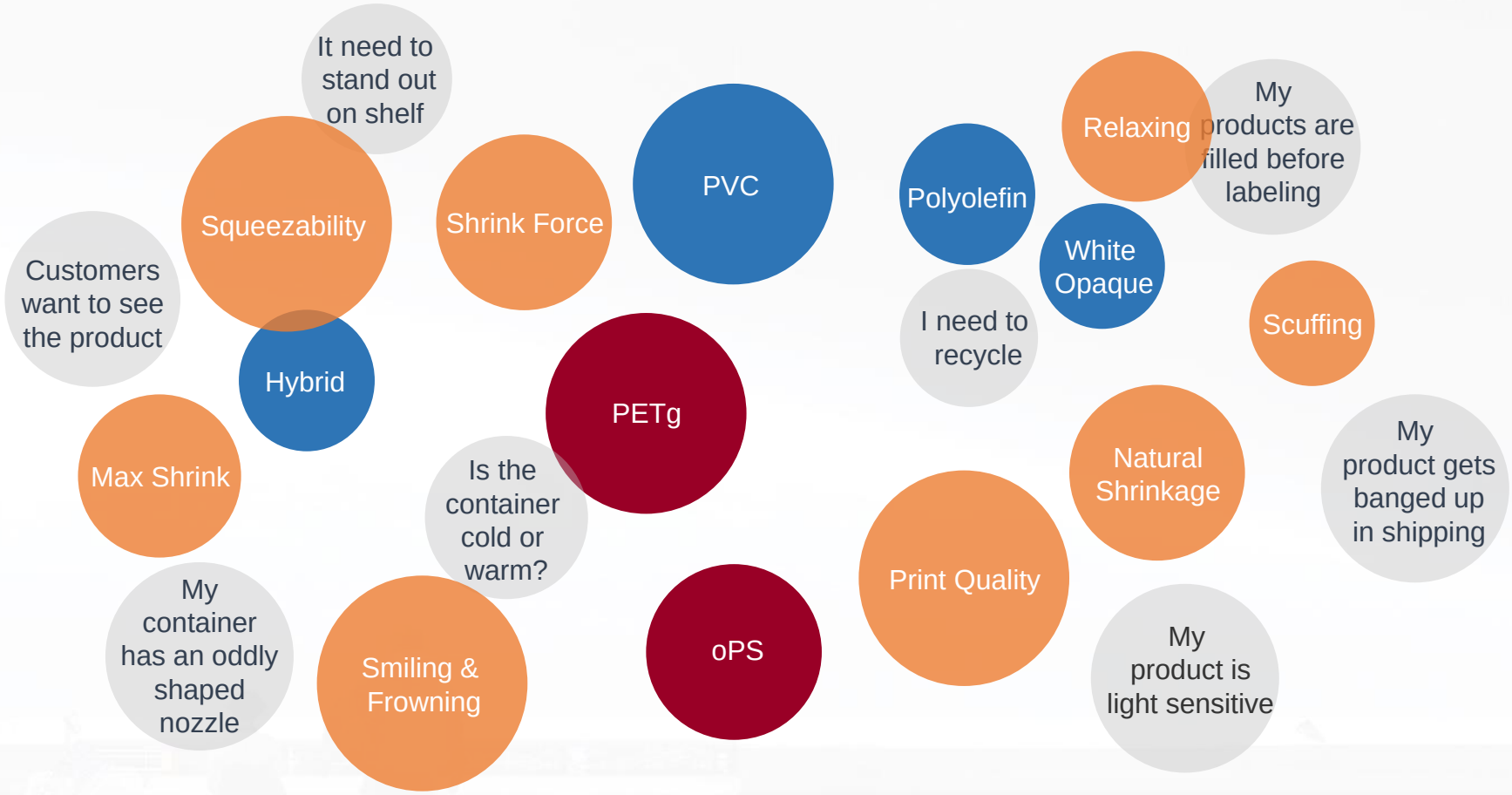
Start With The Polymer Choices . . .



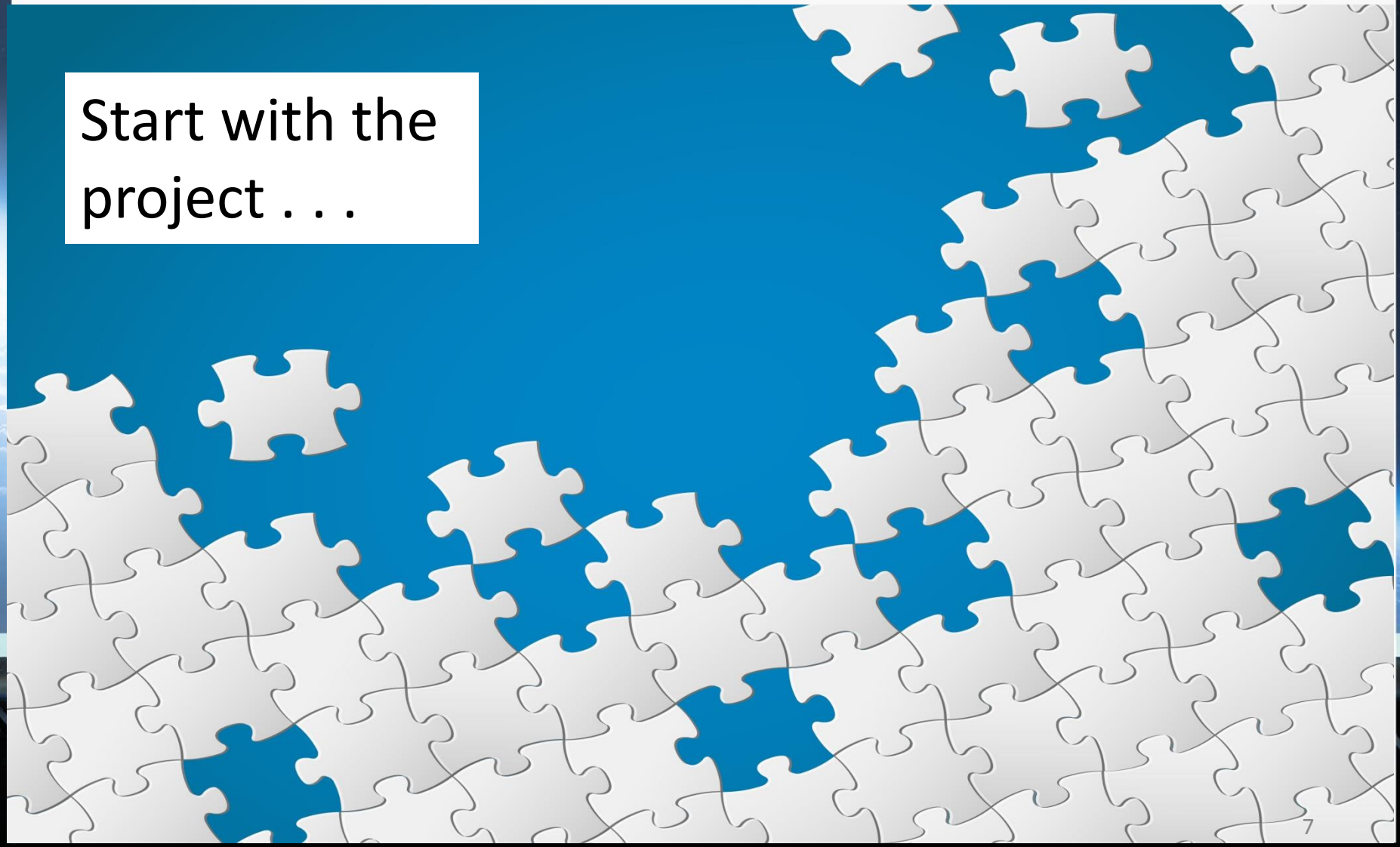
. . . Polymers With Unique Properties



. . . And With Project-Specific Considerations



Let’s Solve The Puzzle



The Project

Fundamental Factors To Consider

1. **Max Shrink required?**
2. **Shrink Force, high or low preferred?**
3. **Application Effects, eg Relaxation**
4. **Particularities**

1. Max Shrink

Max Shrink is the maximum percentage that the label substrate must contract.

For round containers the max shrink is the ratio of the narrowest diameter vs. the widest.

1. How To Calculate Max Shrink

$$\% \text{ Shrink} = 1 - \frac{\text{Narrowest Diameter}}{\text{Widest Diameter} + \text{LF oversize}}$$

2. Shrink Force

Shrink Force is a measure of how much pressure the label applies to the container as it contracts.

2. Shrink Force

- **Shrink Sleeves on thin walled, empty plastic containers may demand lower shrink forces, while …**
- **Bundle Packs may require high shrink forces**
- **Shrink Tension is a substrate characteristic, while Shrink Force also depends on Film Thickness**

2. Shrink Force

The type of tunnel used to shrink the label is the last consideration when determining shrink force.

3. Application Effects

Label application can potentially result in undesirable effects, which may or may not be major concerns for a brand owner.

3. Label Relaxation

- **… can be an issue on empty HDPE containers depending on substrate material and tunnel settings**
- **Squeezable Container?**
- **Thermal expansion coefficient**
- **Temperature activated glue?**

3. Smiling And Frowning

Smiling and frowning refer to warps at the label top and bottom, respectively, that cause it not to follow the container's contours

- → Container shape
- → ***MD- growth***
- → Shrink Force
- → Tunnel settings

4. Particularities

Finally, there are several other concerns that may affect the choice of label substrate.

Particularities

- ✓ **Is PVC an option?**
- ✓ **Is recyclability a major concern?**
- ✓ **Does light need to be blocked?**
- ✓ **Is UV flagging an issue?**
- ✓ **Will transportation cause scuffing?**

Label Film Types

Substrate Alternatives

Label Films Types

- PVC (polyvinyl chloride)
- PETg (polyethylene terephthalate, glycol-modified)
- White Opaque
- oPS (oriented polystyrene)
- PO (polyolefin)
- Hybrid/Layered

PVC (Polyvinyl Chloride)

Characteristics:

- PVC is the traditional mainstay of label films
- Processes and handles well
- Accepts all kinds of printing
- Can meet UV protection & optical brightener needs
- May not conform to a brand's environmental standards

	Shrinkage	Shrink Force	Relaxation	Smiling	Scuffing	Squeezing	Natural Shrinkage	Printing
PVC	55%-65%	Moderate	Poor	Poor	Fair	Poor	Good	Good

PETg (polyethylene terephthalate , glycol modified)

Characteristics

- Clear film
- Highest max shrinkage of all films
- Commonly used when PVC isn't an option
- Processes & handles well
- Excellent printing surface
- Meets UV protection & optical brightness needs
- Works well in steam tunnels

	Shrinkage	Shrink Force	Relaxation	Smiling	Scuffing	Squeezing	Natural Shrinkage	Printing
PETg	75%+	Moderate-High	Poor	Depends on grade	Excellent	Poor	Good	Excellent

White Opaque

Characteristics

- Several versions on market
- Glossy and matte options
- Needs surface printing & over-print varnish
- Black reverse (printed or bicolor) needed for light blocking

	Shrinkage	Shrink Force	Relaxation	Smiling	Scuffing	Squeezing	Natural Shrinkage	Printing
PETg	75%+	Moderate-High	Poor	Depends on grade	Excellent	Poor	Good	Excellent

oPS (oriented polystyrene)

Characteristics

- Clear film with niche uses
- Less vibrant printing than PETg
- Tricky to process: very delicate handling required
- Needs care when printing with solvents: roto-gravure printing requires less acetate as it attacks oPS
- Good in hot air tunnels
- Weak resistance against oils and chemicals

	Shrinkage	Shrink Force	Relaxation	Smiling	Scuffing	Squeezing	Natural Shrinkage	Printing
OPS	55%-65%	Very Low	Excellent	Excellent	Poor	Excellent	Poor	Needs care

PO (polyolefin)

Characteristics

- Clear, floatable film with moderate clarity
- Prints reasonably well; needs corona treatment
- Generally chosen for APR (US) or EPBP (EU) recyclability shrink sleeve standards for PET containers
- Sometimes chosen for other properties, such as anti-crinkling

	Shrinkage	Shrink Force	Relaxation	Smiling	Scuffing	Squeezing	Natural Shrinkage	Printing
PO	50%-60%	Low	Good	Fair	Poor	Good	Needs care	Good

Hybrid/Layered

Characteristics

- Clear film combining advantages of PETg & oPS
- Excellent printing surface
- Good in hot air tunnels
- Good product resistance against oils and chemicals

	Shrinkage	Shrink Force	Relaxation	Smiling	Scuffing	Squeezing	Natural Shrinkage	Printing
Hybrid or Layered	65-70%	Low	Good	Very Good	Excellent	Good	Fair	Excellent

Summary

	Shrinkage	Shrink Force	Relaxation	Smiling	Scuffing	Squeezing	Natural Shrinkage	Printing
PVC	55%-65%	Moderate	Poor	Poor	Fair	Poor	Good	Good
PETg	75%+	Moderate-High	Poor	Depends on grade	Excellent	Poor	Good	Excellent
OPS	55%-65%	Very Low	Excellent	Excellent	Poor	Excellent	Poor	Needs care
Hybrid or Layered	65-70%	Low	Good	Very Good	Excellent	Good	Fair	Excellent
PO	50%-60%	Low	Good	Fair	Poor	Good	Needs care	Good

The Decision Journey

The Decision Journey

After accounting for max shrink, shrink force, application effects and particularities, and considering polymer choices, it's time to choose the best film for the application.

kp's Shrink Film Label Selector

Klöckner Pentaplast developed a decision matrix which helps you select the right film for specific applications.

The interactive matrix is available in the Labels Films Knowledge Center on www.kpfilms.com

- Inputs include:
- Shrink tunnel type
- Percent shrink required
- Container type
- Label concerns

See the selector in booth 3646

KLÖCKNER PENTAPLAST
United States | Booth: 3646
View profile | Watch video

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KP Shrink Film/Label Selector

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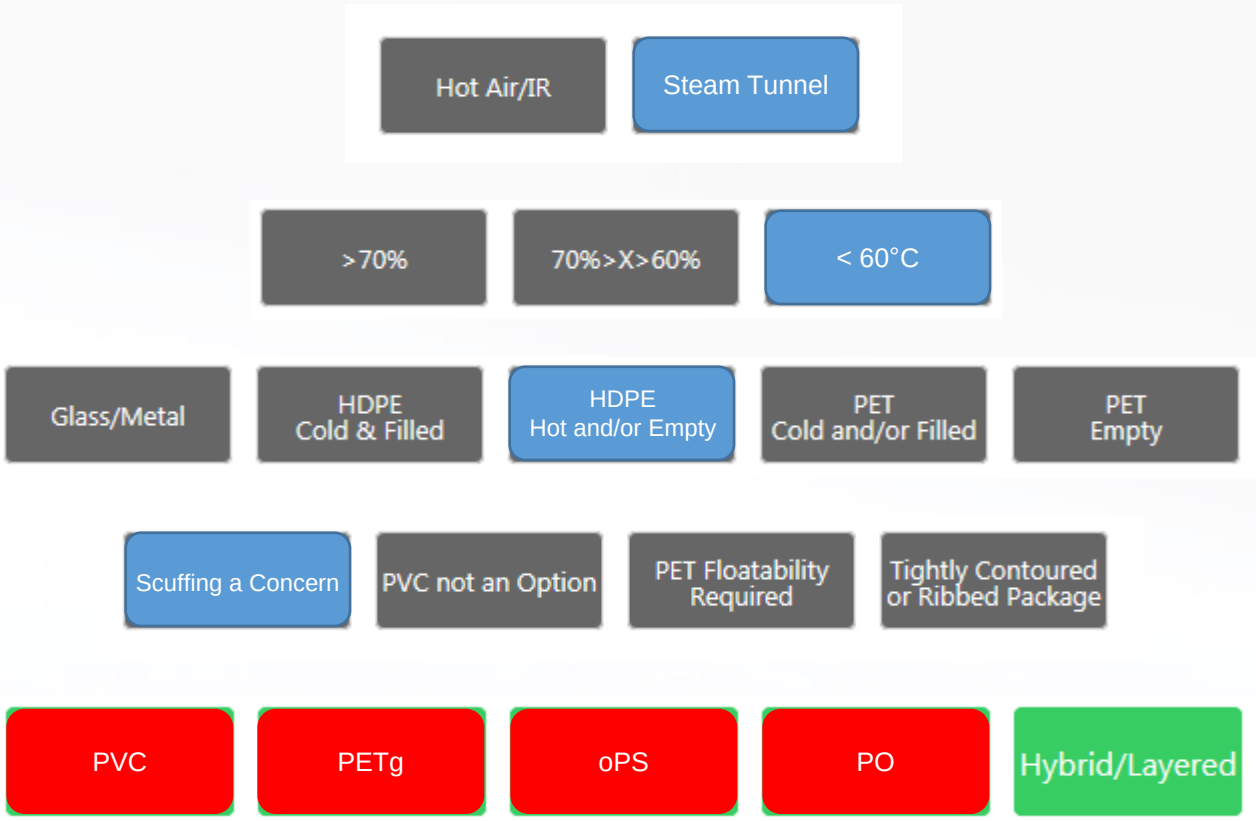

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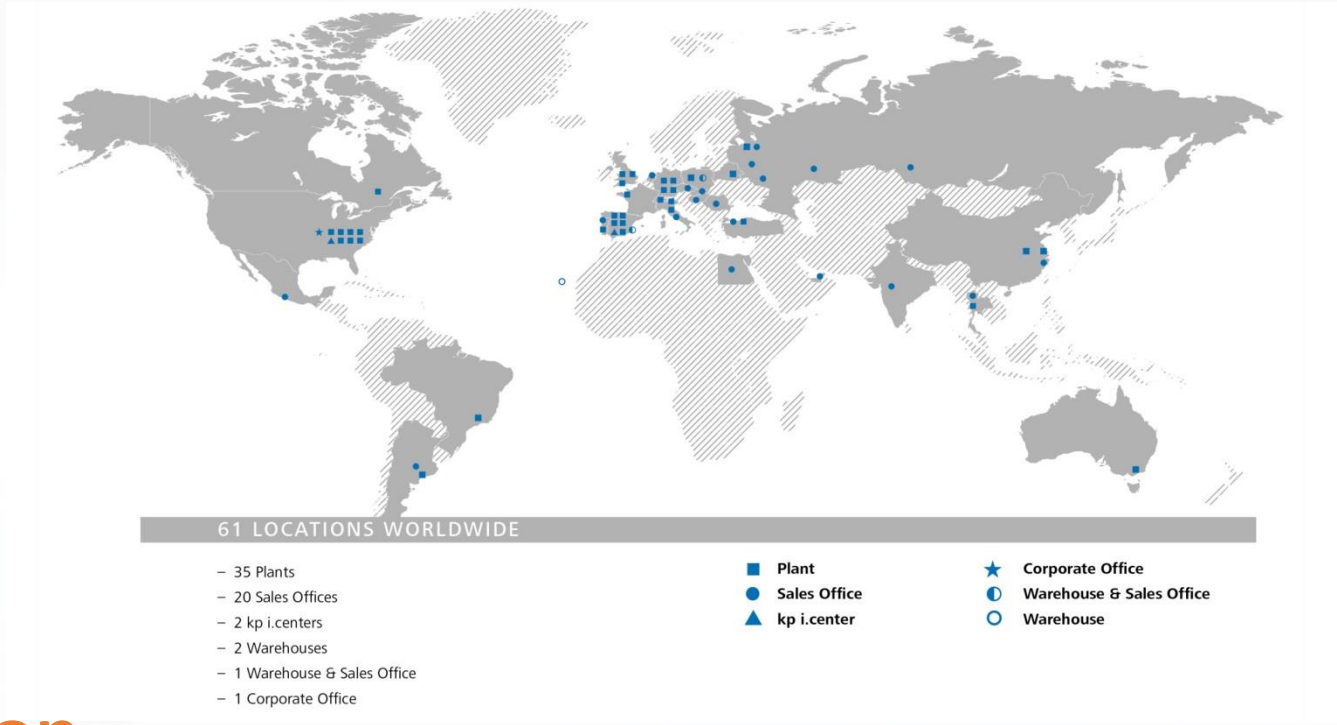
About kp

18
Countries

61
Locations

> 6,300
Employees

> € 1.9 Billion
Annual revenues



About kp

Listen, Understand, Innovate

At Klöckner Pentaplast, we listen to the value chain, understand the challenges, and apply our global resources and technical expertise to innovate label films to our customer's needs.

The same old solutions fall short in a rapidly changing world