



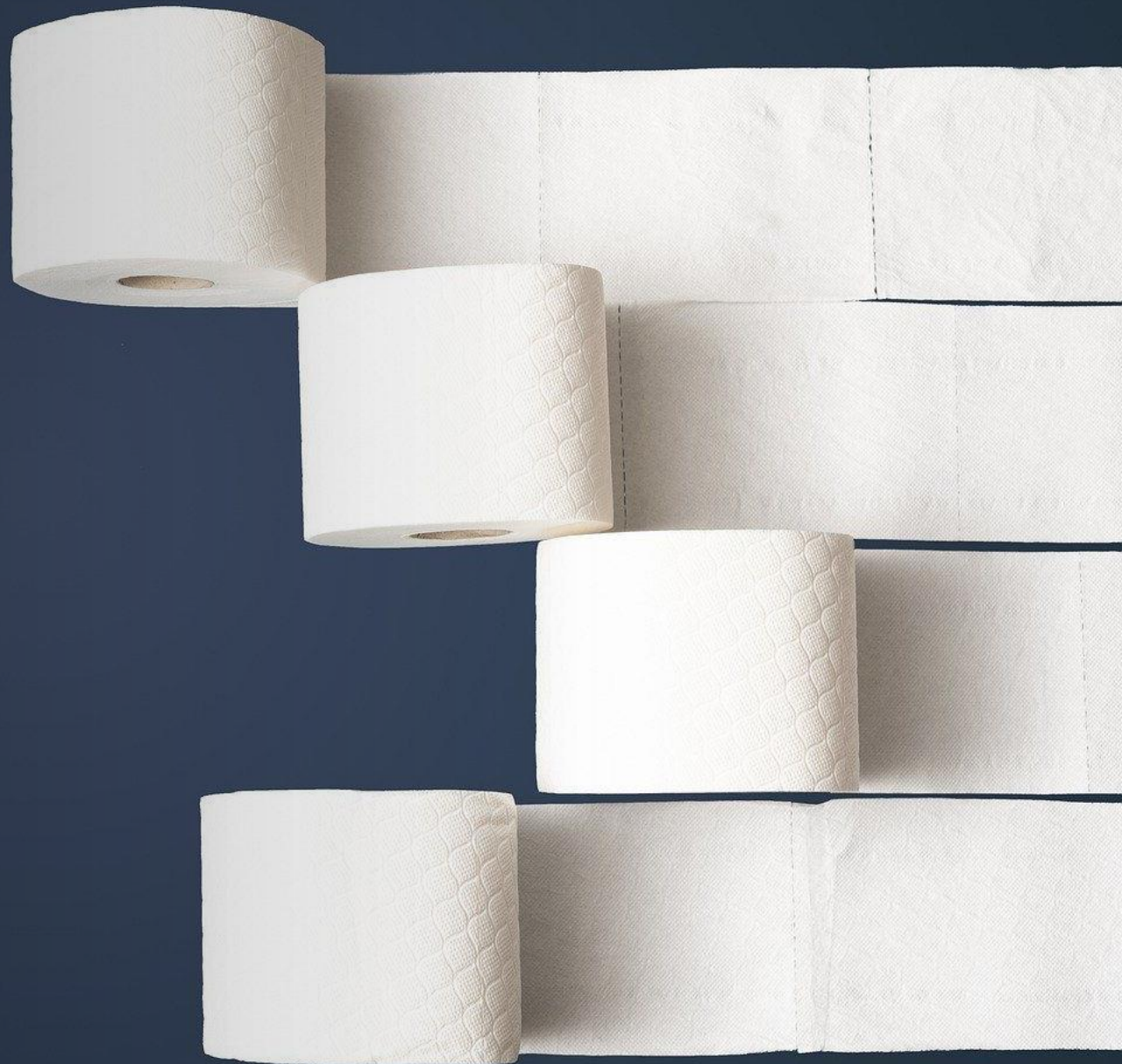
# Coating and creping

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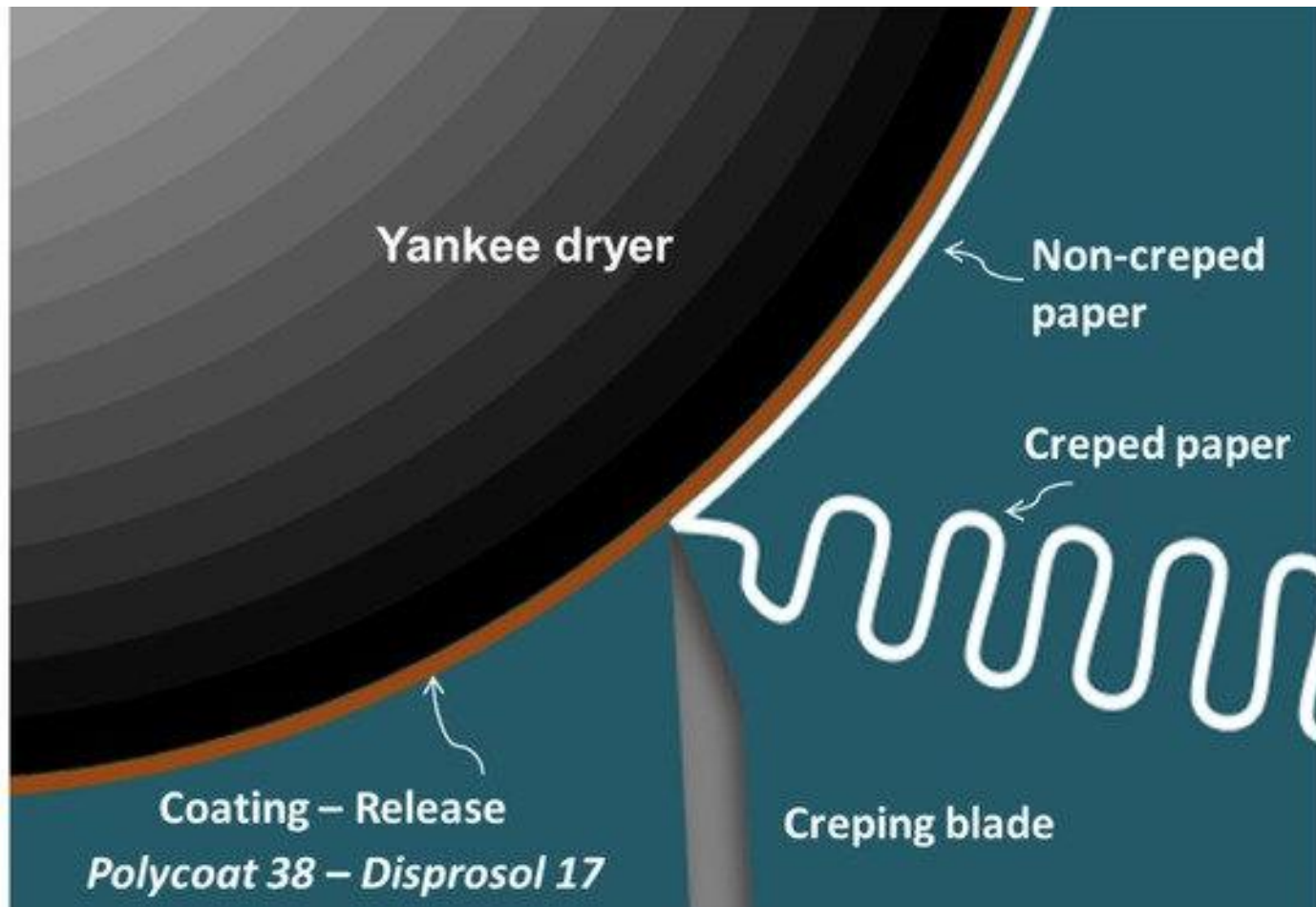
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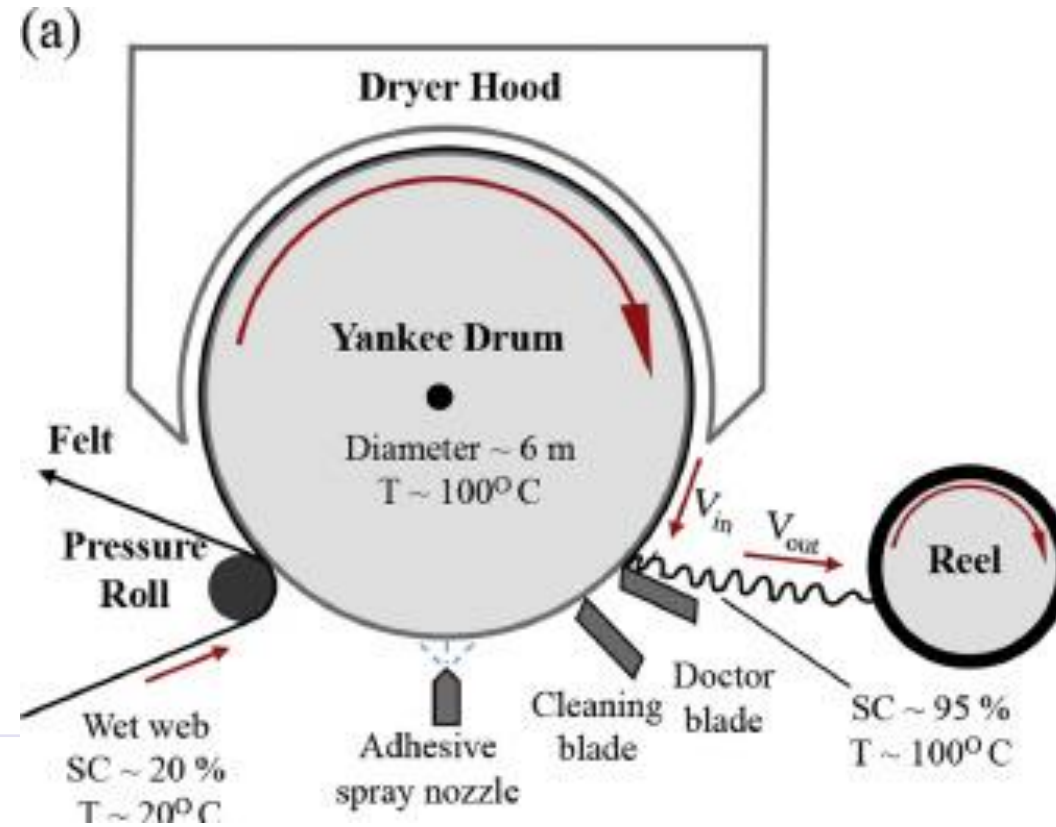


# Introduction



- A significant factor when producing tissue papers
- Done for tissue paper types
- Creates macro- and microfolds
- Brings softness, higher bulk and better stretching to paper

# General mechanical structure





# Coating

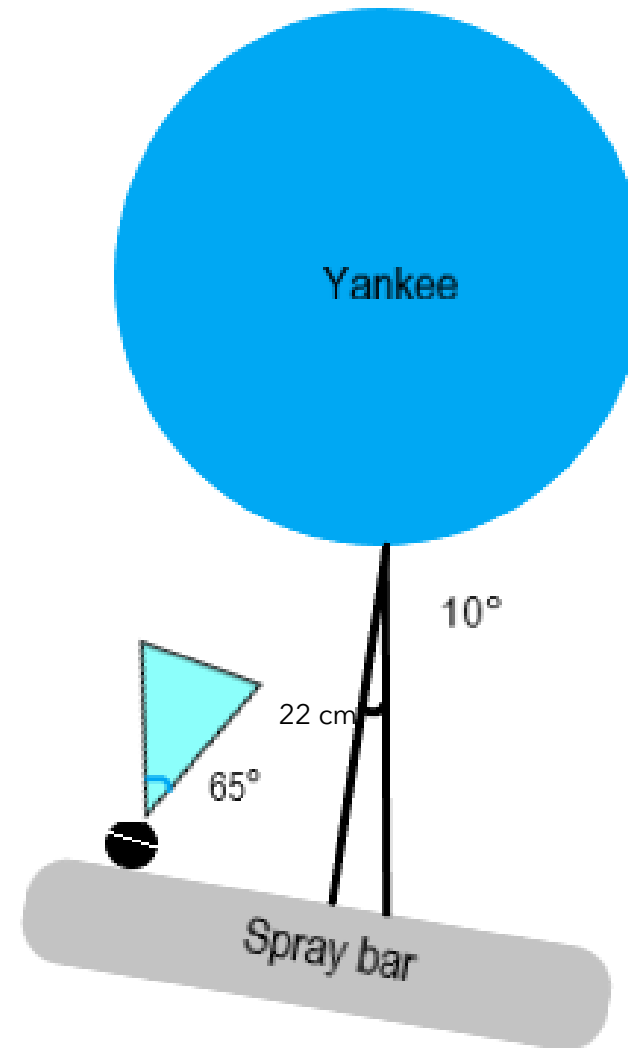
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- Coating settings
- Coating chemicals
  - Adhesive
  - Release
  - Modifiers

# Coating settings

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- Chemicals mixed with water and pumped through filters to spray nozzles
- Nozzle settings are important
  - Spray bar is inclined  $10^\circ$  from vertical
  - Nozzles are set to spray over  $65^\circ$
- Sufficient even coating without splatters





# Adhesive

- Helps paper stick to the Yankee
- Protects Yankee's surface from crepe blades
  - Forms a hard layer on the surface of the Yankee under heat
- Usually a film-forming or thermosetting polymer

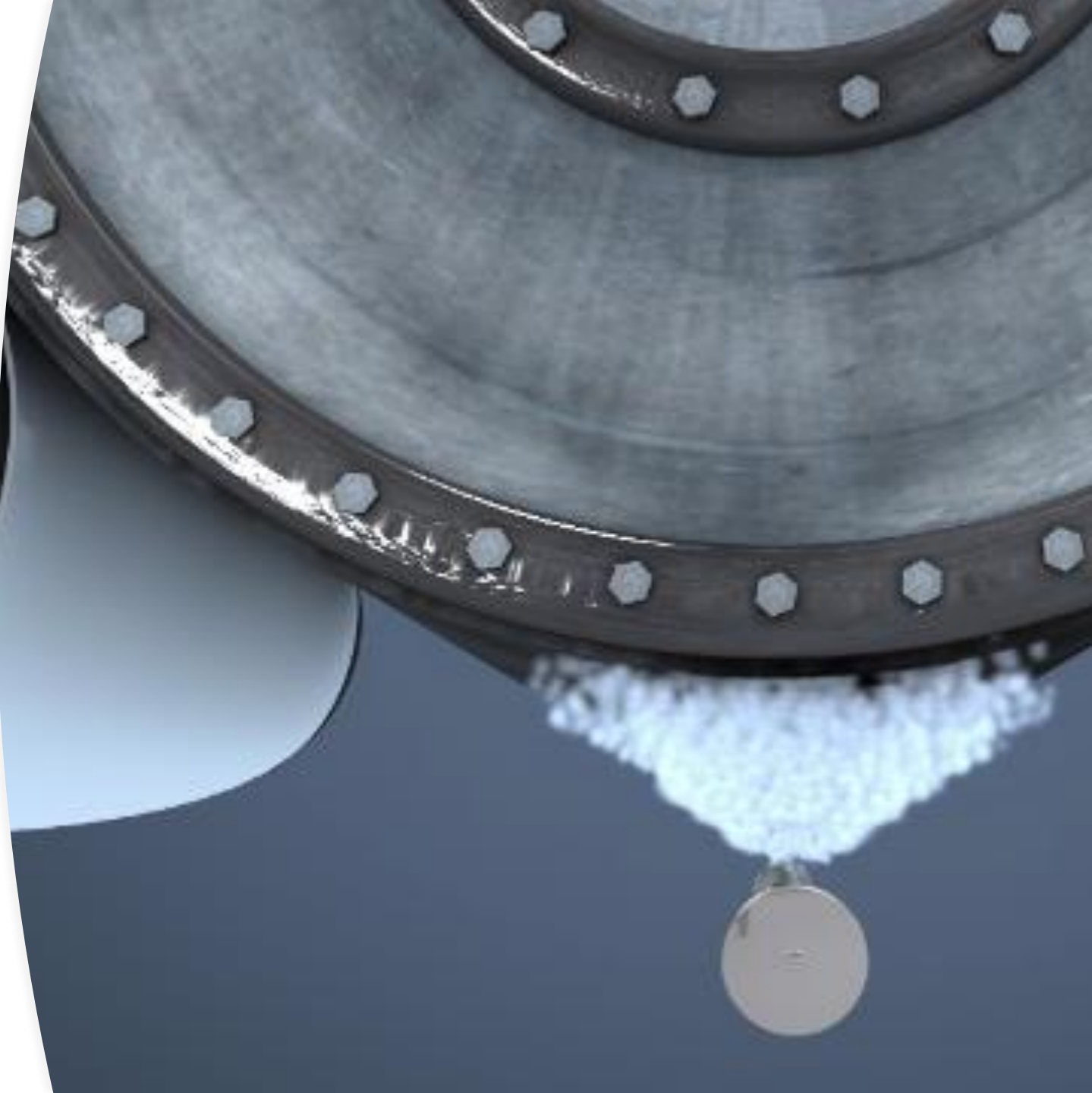


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# Release

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- Helps release paper from the yankee
- Softens the adhesive and makes the coating more flexible
- Controls thickness of the hardened layer
- Hydrophobic oil-based agent
  - Similar to defoamers
  - Surfactants

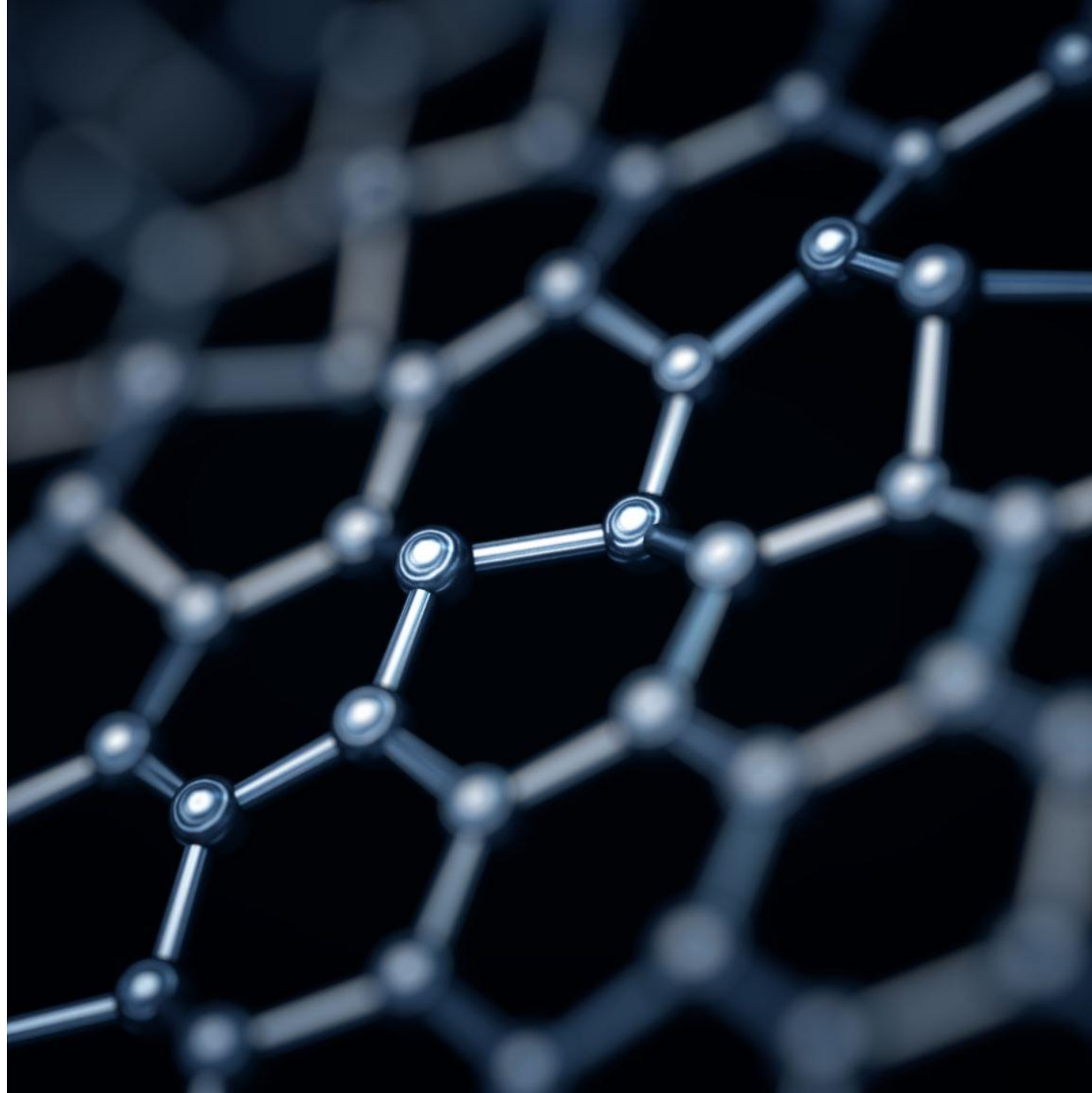


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# Modifiers





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- Metallic components, phosphorous based ionic and non-ionic surfactants
- Adjusts the film rheology
- Can modify protection and/or creping
- Can increase sheet softness and bulk



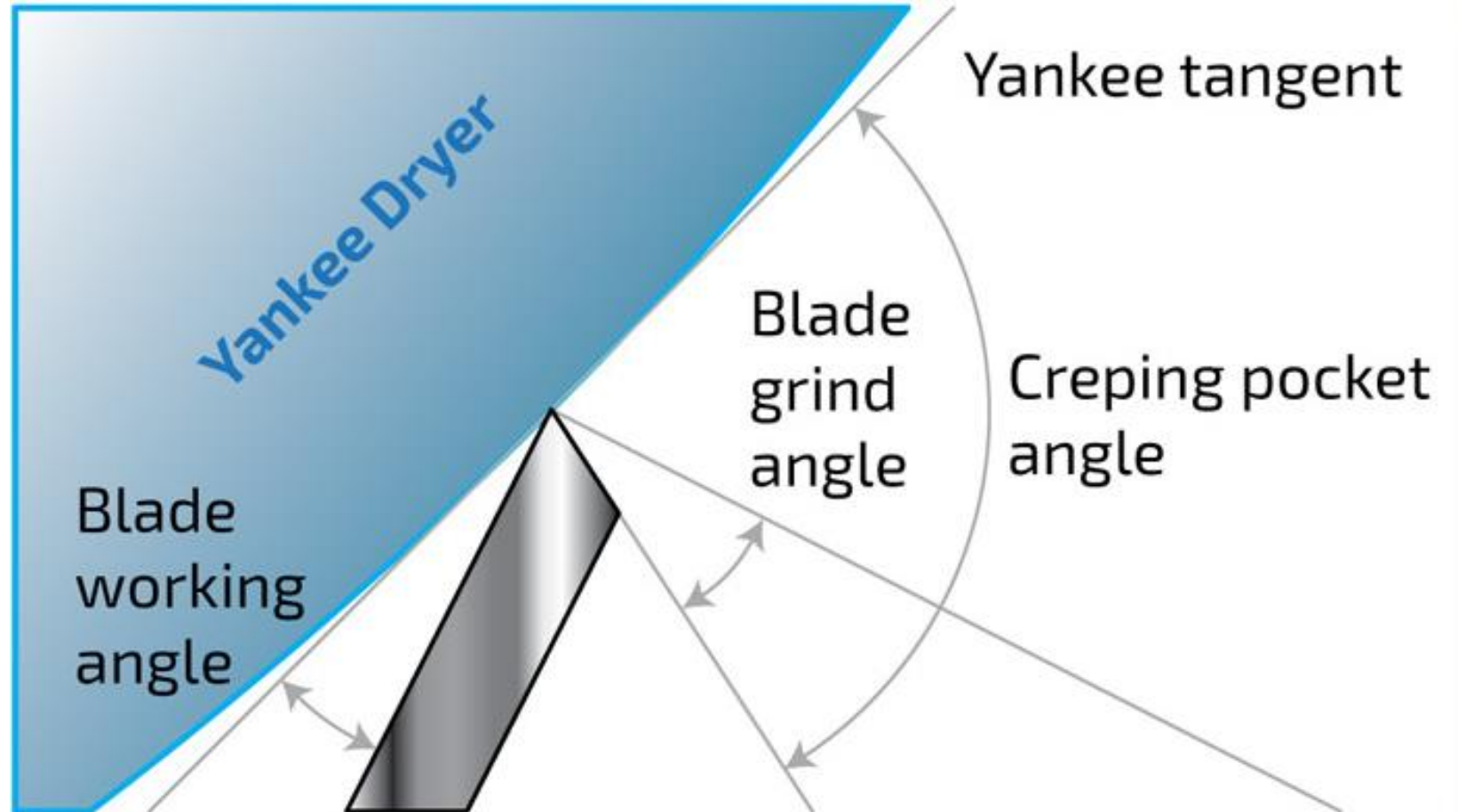


# Recap of coating chemicals

	<b>Lots of release</b>	<b>Not much release</b>
Lots of adhesive	Good bulk Good softness 	Low bulk Good softness 
Not much adhesive	Good bulk Low softness 	Low bulk Low softness 

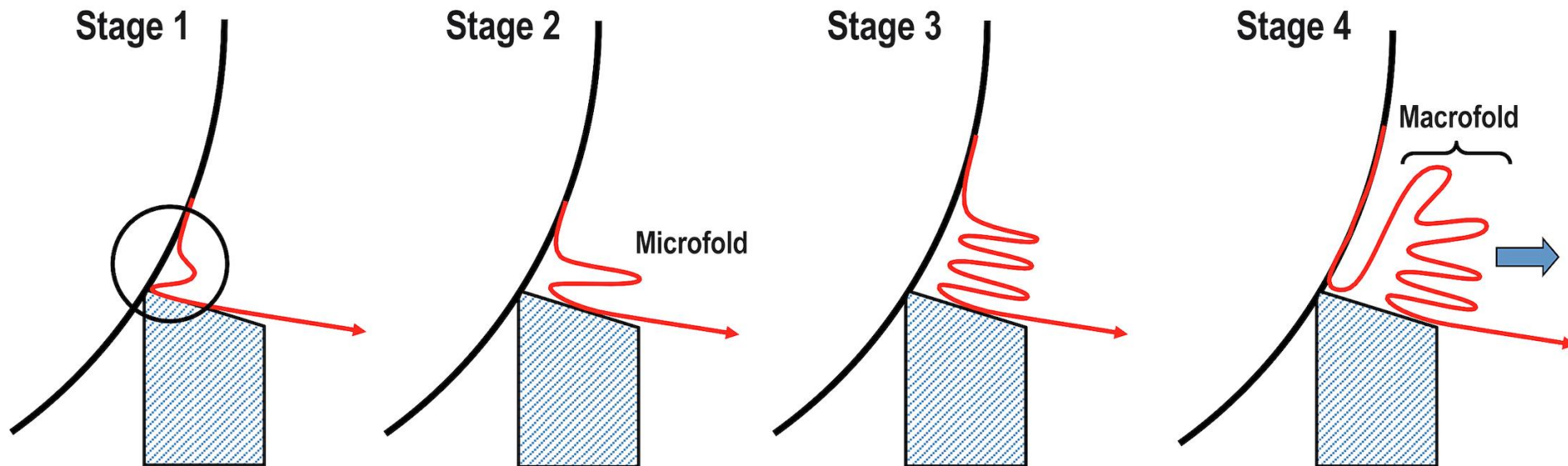
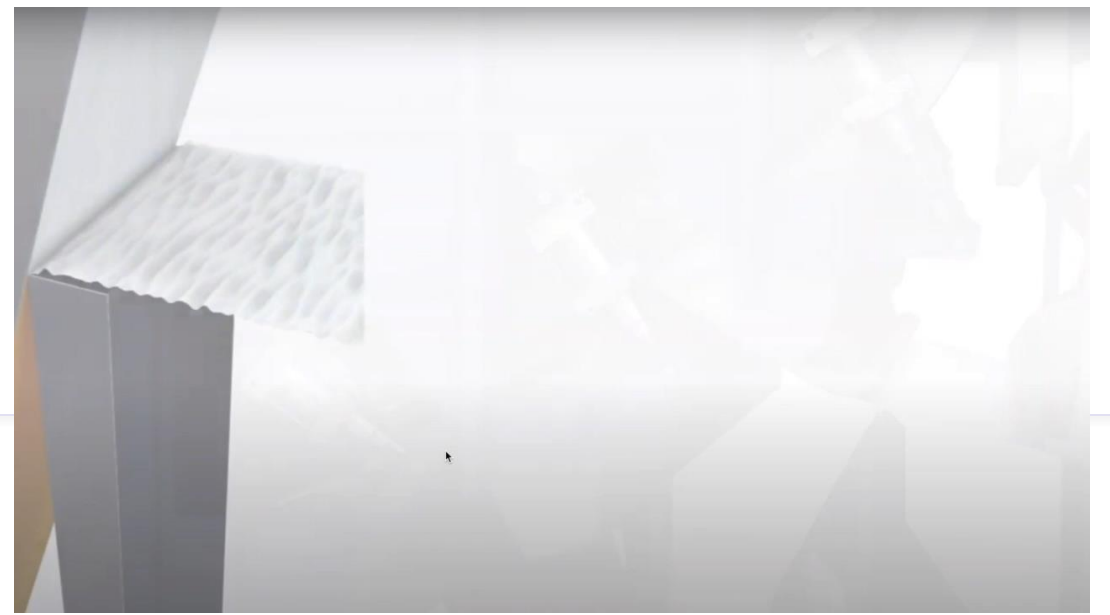
# Blades

- 3 types:
  - Doctor blade = crepe
  - Cleaner
  - (Take off)
- Materials:
  - Steel
  - Ceramic
- Blade settings

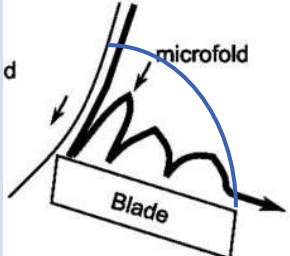
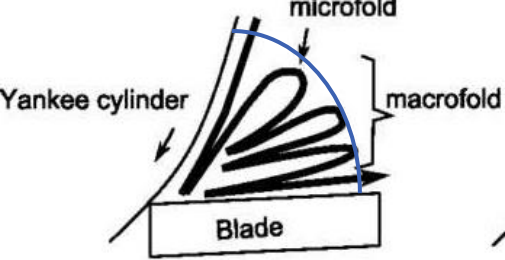


# Folds

- Small angle: Many microfolds, no macrofolds. Irregular structure
- Great angle: Few microfolds, thin macrofolds. Regular structure



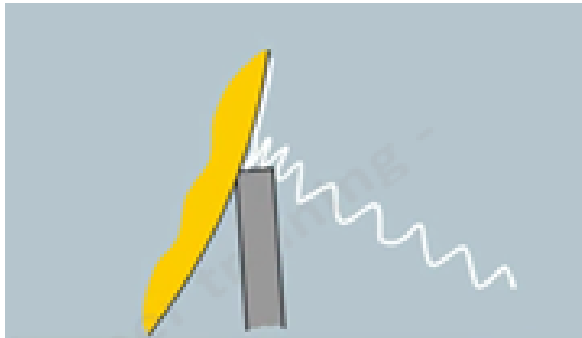
# Recap of folds

Creping pocket angle	Folds	Effect	Product
Big		Small increase in thickness & roughness	<b>Soft paper</b>
Low		Big increase in thickness & roughness	<b>Low softness</b>

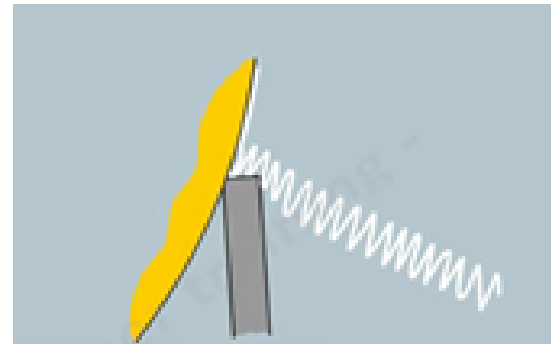


# Crepe ratio

$$\text{Crepe ratio} = \frac{\text{Yankee speed} - \text{Reel end speed}}{\text{Yankee speed}} \times 100\%$$



- Low crepe ratio
  - Little stretch
  - Coarse (loose) structure
  - High softness



- High crepe ratio
  - Dense structure with high bulk
  - High stretch, shorter paper
  - Low softness

Thank you! Questions?

