Determination of Doctor Angle

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Importance of Angle Measurement

- Doctor angle plays a significant role in getting proper doctoring results. Too steep an angle can damage the roll surface and/or doctor blade itself, while too little an angle may result in inadequate cleaning of roll surface.
A Simple Approach

- The objective of this presentation is to show a simple, very simple tool to determine angle of doctor blade on any roll.
- However, it is always recommended to get a proper doctor angle measuring device from some good supplier.
Items Required

- Two templates similar to these indicated.
  
  (You may use two identical visiting cards for this.)

- Scissors.
Step One

- Cut these along dotted lines.
Step Two

- You will get shapes as under-

Template A          Template B
Hold template A in such a way that its one corner touches the desired roll at the point of doctor blade, and the line indicated in red color in aligns the doctor blade.
Hold template B in such a way that its one corner touches the desired roll at the point of doctor blade, and the other corner touches the roll.
Measurement

Place both templates as shown in the figure, and measure overlap angle on template B. The overlap angle is the doctor angle (almost) for larger size rolls. However, there would be a minor error for smaller rolls which needs to be corrected as shown in next slides.
Scaling of Template B

For ease, the top side of template B can be scaled as shown in figure above.

Whenever you need to measure angle of any doctor blade, just measure directly from these, compensate for correction factor, and get the correct angle immediately.
It can be shown that the error angle is a function of roll diameter and template length. It can be given as $e' = \sin^{-1}(L/D)$.

Where,

- $L$ is template length and
- $D$ is roll diameter.
Error Due to Template B

The error caused by the limitations in design of Template B decreases with increase in roll diameter. Some typical values are as indicated for template length of 75mm-

- Roll Dia.  Error  Example
  - 750mm  5.7°  Press Roll
  - 1500mm  2.9°  Dryer
  - 4250mm  1.0°  14’ Yankee
Correction of Error

- The error, though it is a minute one, can be added to the measured angle value to get the correct doctor blade angle.
Measured Angle

- Doctor angle can be expressed in two ways.
  - With reference to radial line (BSI), and
  - With reference to tangential line (ASTM)
- This method gives angle along tangential line.
- To get angle along radial line, just subtract the angle computed from 90°.
Angle Measured

- After you have got the running doctor blade angle, you may check with the supplier guidelines whether it is correct or needs to be altered.
Happy Doctoring!

Please send your comments and feedback to:

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