

## Strip profile and flatness seminar course

1. Basic features of strip crown in conventional 4-high mill
  - a. Strip crown transient through one rolling campaign in general product-mix
  - b. Strip crown transient through one rolling campaign in narrow width product such as tin plate black coil
  - c. Concept of body crown and edge drop (feather edge)
  - d. General strip crown behavior by strip width
  - e. General strip crown behavior by thickness
  - f. General strip crown behavior by deformation resistance
  - g. Influence of each stands to delivery strip crown
  - h. Roll thermal crown
  - i. Roll wear
  - j. Influence of BUR wear
  - k. Rougher WR crown, transient of entry sheet bar crown and its influence to finisher stands
  - l. WR crown line-up in conventional 4high mill
  - m. Edge build up and high spot
  - n. Influence of hot strip crown to cold strip crown
  
2. Basic features of strip flatness
  - a. Intuitive knowledge on flatness change
  - b. Flatness sensitivity by thickness and width
  - c. Influence of crown change to strip flatness
  - d. Influence of each stands to delivery strip flatness
  - e. Influence of ROT and coiling to strip flatness
  - f. Capability of skin pass mill to flatness
  - g. Influence of entry strip flatness to the delivery flatness at cold rolling mill
  
3. Practical ways to control strip crown, or how to use roll crowning, in conventional 4-high mill
  - a. Reduction of strip crown by taper work roll
  - b. Reduction of strip crown with big BUR crown
  - c. Special roll crown for tin plate black coil
  - e. Other introduced ideas by engineers before the installation of crown control devices
  
4. Introduction of crown control device to HSM finisher stands
  - a. Strong WR bender
  - b. Work roll shifting with CVC-type roll crown
  - c. Work roll shifting with one-sided taper roll crown
  - e. Work roll shifting to prevent edge build-up and high-spot
  - f. Work roll shifting to produce optimal profile for tin plate black coil with minimum tolerance
  - d. Pair-cross Mill
  
5. Strip crown calculation
  - a. Explanation of basic concept
  - b. Roll deformation model by "the strip crown under uniform pressure"
  - c. Strip deformation model by "Crown-ratio heredity coefficient" and "Imprinting ratio"
  
6. Strip flatness calculation
  - a. Old theory of strip flatness
  - b. New theory of strip flatness

- c. Flatness calculation by "Flatness disturbance coefficient"
- 7. Combined calculation of strip crown and flatness for 7 stands finisher
  - a. Combined calculation formula to calculate strip crown and flatness
  - b. Examples of calculation
- 8. Principle of crown-flatness set-up
  - a. General way of crown-flatness set-up
  - b. Crown-flatness set-up considering light gauge rolling
  - c. Crown-flatness set-up considering width change at finisher
- 9. Profile defects: Causes and countermeasures
  - a. Big crown
  - b. Wedge
  - c. Edge build up
  - d. High spot