

Cylindrical Grinding

"Peel"

"Peel" grinding is the process of a thin wheel (1/4" to 1/2" thick) dressed with a lead to equal the total amount of stock per pass and is used instead of a plunge or standard traverse grinding operation. The process is more like turning with the wheel taking off small to large depths of stock in one or two passes. Because it is using CBN it can be applied to hard or soft materials. If the material is non-ferrous like "carbide" Diamond can be used. Wheel S.F.P.M. is normally 20 to 24,000 S.F.P.M. and part rotation for O.D. applications can be as high as 12,000 rpm.

Part: Pump Shaft - 120 different drawings - O.A. length \approx 5 - "Peel" grinding section \approx 2.5" length with diameters ranging from 1.25" to 1". Each part has 2 diameters, 2 faces and multiple radii.

Part Tolerances: Roundness ± 0.0002 " at 1.67 Cpk

Material: Hardened Steel

Hardness: 58 - 62 Rc

Wheel Specification: 20" x 1" x 8" - wheel type 14V1SP U=0.450" X=0.500" - Vitrified CBN

Process (Before)

Conventional Al₂O₃ Wheel

Wheel Speed: 8,500 S.F.P.M.

Work Speed: 85

Pieces per dress: 1

In-Feed per dress: 0.0007

In-Feed rate: 0.0155" per min. (Rough)

Coolant: Semi Synthetic

Total Cycle Time: 2 minutes

Process (After):

Vitrified CBN ("PEEL")

Wheel Speed: 24,000 S.F.P.M.

Work Speed: 480

Pieces per dress: 20

In-Feed per dress: 0.00003

IPR*: 0.001" to 0.007"

Coolant: Semi Synthetic

Total Cycle Time: 1 minute

Savings / Advantages: Old process using Al₂O₃ needed a lot of wheel changes and very long set up. The Peel grinding wheel can grind all of the 120+ parts with the same set-up and the same wheel (50,000 parts per wheel). The old process was not meeting Cpk and the new process is many times the Cpk requirement. The cell has reduced the number of people by more than 10 per shift.

* Inches per revolution