



The Grinding Doc's

High Intensity Grinding Course

**Giving you the knowledge, tools
and skills to revolutionize your
grinding operations.**

www.TheGrindingDoc.com

Schedule & Content

In the months following the course, you'll see cycle times drop, wheel consumption drop and general headaches disappear as you learn the tools to slowly, steadily and significantly improve your grinding operations.

Day 1:

- Fundamentals: grit/bond/porosity, wheel grade, grit types, bond types, rubbing/cutting/plowing, wheel wear, specific energy.
- Key Parameter 1: *Specific Material Removal Rate*.
- Key Parameter 2: *Grit Penetration Depth*, finding the “Sweet Spot” of the wheel.
- Increasing removal rates while keeping *Grit Penetration Depth Constant*.
- Common mistakes in choosing grit size, wheel specification.
- Wheel wear & “The No Dress Test” for analyzing the cycle & minimizing wheel consumption.
- Power Signal: using it to assess the grinding process; using it to evaluate trial wheels.
- Thermal damage & “Grinding Burn” – different types, how they affect part quality, how to reduce it.
- Single-point dressing, choosing parameters correctly; common mistakes; Plunge diamond roll dressing; diamond disc dressing; common mistakes; avoiding the dreaded “RPM Ratio”.
- Using *The Grinder's Toolbox*® to find optimum dressing parameters.

Day 2:

- Cooling: pressure or velocity or flowrate? Measuring velocity.
- Cooling: Nozzle design.
- Cooling: Using *The Grinder's Toolbox*® to design a high-performance cooling system.
- Cooling: Cleaning nozzle. Is it worth it? Common mistakes.
- CBN on hardened steel: how it works; Diamond on carbide & ceramic: how it works.
- Electroplated wheels: how they work; common pitfalls.
- Truing of superabrasive wheels; dressing/sticking of superabrasive wheels, common mistakes.
- Temperature predictions in *The Grinder's Toolbox*®
- Burr: how to reduce it.
- Loading: different types; how to reduce it.
- Chatter: different types, how to pinpoint source, how to eliminate it.
- Up-grinding vs. down-grinding.

Attendees are involved in *Group Exercises & Brainstorming* sessions throughout the course to apply the knowledge and techniques learned.

Day 3:

- Reducing cycle times; Reducing grinding costs.
- Using ceramic-grit “SG” and Cubitron grits correctly; common mistakes.
- Cylindrical grinding: choosing parameters for the sweet-spot and low temperatures.
- Using *The Grinder's Toolbox*® in cylindrical, surface & creep-grinding grinding.
- New developments in grinding.
- Continuous improvement in grinding.
- Using *The Book of Grinding*® for steady, long-term continuous improvement.

Common grinding questions

Q: We constantly battle burn. Why is this?

A: Most burn problems don't come from high material-removal rates, then come from one of three things: 1) choosing a grit size that's too large and dressing the wheel dull to achieve surface finish; 2) Choosing a Grit Penetration Depth that's too small, which causes excessive rubbing; or 3) Poor cooling. Once you get these where they should be, you'll be amazed at how fast you can grind without burn.

Q: We constantly battle chatter? Why?

A: If it's "self-excited" chatter, it's quite likely that your wheel is dull. You get chatter, slow down your feedrates, which causes even more wheel dulling, exacerbating the problem. At the *High Intensity Grinding Course*, you'll learn how to choose your parameters to keep your normal forces low and avoid chatter. You'll also learn how to identify the source of other types of chatter: wheel imbalance, wheel eccentricity, bad RPM ratios (very common in cylindrical grinding), and machine-alignment issues.

Q: Do we need to improve our cooling?

A: That depends on the grinding operation. In some grinding operations, poor cooling isn't a problem. In some grinding operations, it's deadly! At the *High Intensity Grinding Course*, you'll learn where you need good cooling, and then how to design a high-performance cooling system.

Q: Our operators are constantly arguing over which grinding speeds & feeds are correct, and they all disagree. Why?

A: Because they're thinking in terms of feedrates and wheel speeds. They need to think in terms of *Grit Penetration Depth*. At the *High Intensity Grinding Course*, you'll learn how to calculate the Grit Penetration Depth and find where the "Sweet Spot" of the wheel is.

The Grinder's Toolbox®: Each attendee receives *The Grinder's Toolbox*, a program for calculating optimum grinding, cooling and sticking parameters.

The Book of Grinding®: Each attendee receives *The Book of Grinding*, 1800 pages of practical grinding information they will use long after the course is over.

Upcoming Courses & Cost

Visit www.TheGrindingDoc.com

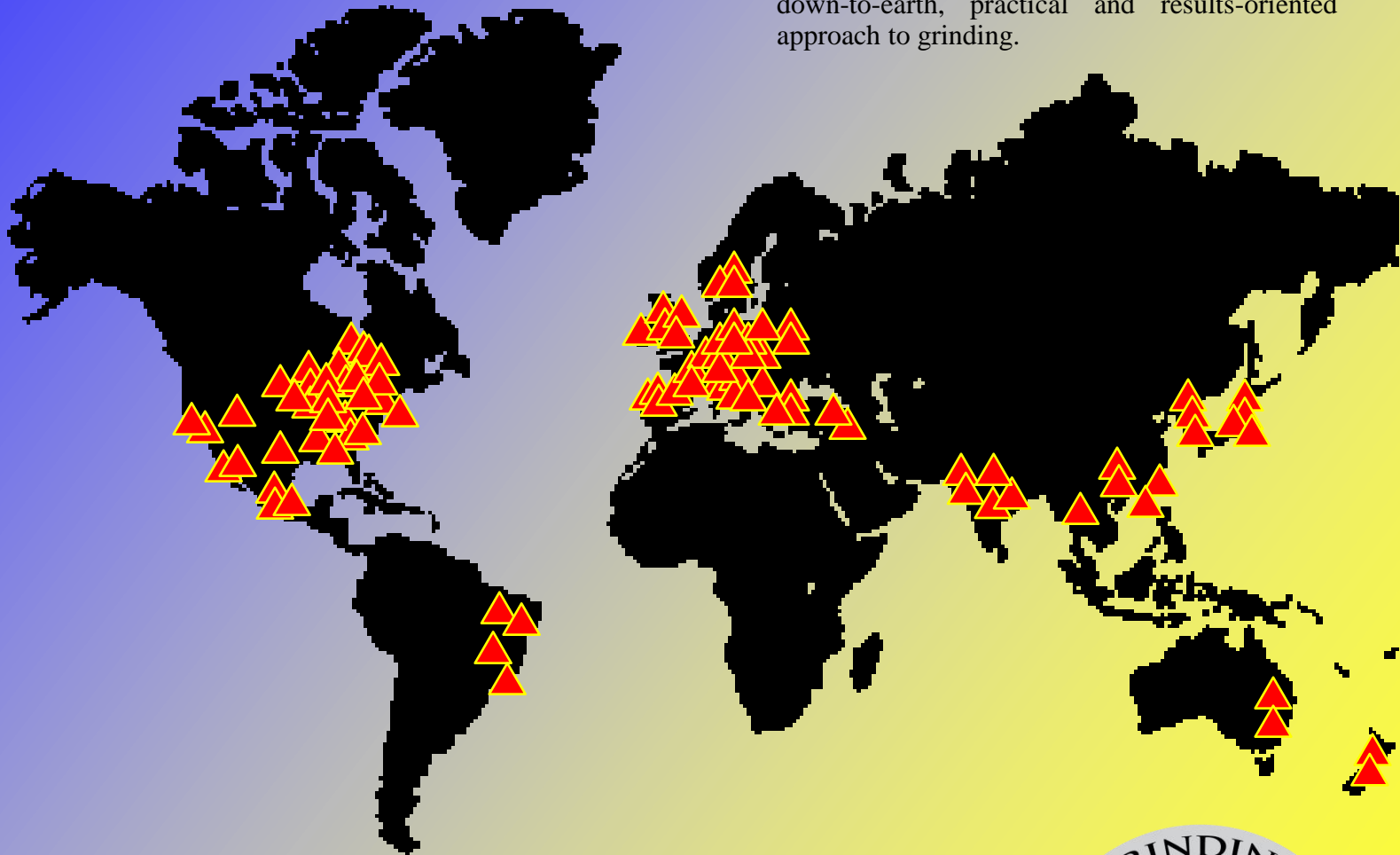
1. All of *The Grinding Doc's* courses and seminars are non-promotional. The host gets no "air time" to promote their products. However, attendees are welcome to discuss with host representatives during coffee breaks and meals.
2. Dates forthcoming.
3. Significant discounts for companies sending more than one person.
4. For those who purchase a *Grindometer* with the course, there is a significant discount. *The Grindometer* is given to attendee on the first day of course.
5. There is a discount for those who sign up early. The maximum number of attendees is 20 and courses typically fill up.
6. An in-house course can be arranged at the company. Contact Dr. Badger for details.

About *The Grinding Doc*



The Grinding Doc: Dr. Jeffrey Badger has a degrees in Mechanical Engineering from The University of Texas at Austin, Pennsylvania State University and Trinity College in Dublin, Ireland. He is known as “The Grinding Doc” from his question/answer column in *Cutting Tool Engineering*. He works independently as an expert consultant in grinding.

Jeff Badger has worked in grinding facilities around the world and brings a no-nonsense, down-to-earth, practical and results-oriented approach to grinding.



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