EAST~LIND
HEAT TREAT INC

Telephone: (248) 585-1415
Fax: (248) 585-3045

The Tool and Die Heat Treat Specialists.

Resource Center

"Quality and Service Foremost"

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Heat Treating Tips for the Hardening of Tool & Die Steels

- Your Heat Treater needs to know if a part has been previously hardened or is pre-heat treated stock. It must be annealed prior to re-hardening.
- Your Heat Treater needs to know if a part has been welded. It too must be annealed prior to hardening.
- Your Heat Treater needs to know if a welded part is composed of two different steel types.
- Your Heat Treater needs to know if a part is received in the finished condition or with minimal grind stock (which is generally not advisable).
- Your Heat Treater needs to know if your stainless steel parts are to be Pacifated after heat treatment.
- Your Heat Treater needs to know if a part is to be Wire Burned (EDM) after heat treatment so it can be given a sufficient temper.
- Your Heat Treater needs to know if a part to be processed for thru-hardening is to be nitrided afterwards.
- The proper process order for parts to be nitrided is…
  1. Rough machine
  2. Heat treat (through-harden & temper at 1000℉ minimum)
  3. Finish machine
  4. Nitride (part should remain stable with virtually no size change)
- Do not specify a hardness that is so high (close to the "as-quenched" hardness) that it does not allow your Heat Treater to properly temper the part. (See East-Lind Heat Treat's Recommended Maximum Hardness for Steels reference guide.)
- If you define a precise heat treat "process" (i.e., specific temperatures, times, quenches, etc.), AND a precise heat treat "spec" (i.e., hardness, case depth, etc.) on your work order, East-Lind Heat Treat will process the job per the customer's specified "process". Please keep in mind that this may or may not meet your requested "spec."

- East-Lind Heat Treat does not recommend carburizing steels with a carbon content exceeding .30% (4140, 4150, 6150, etc.). These have a tendency to fracture in process.
- East-Lind Heat Treat does not recommend carburizing steels more than one-third through their cross-sectional thickness. (Example: no more than .040" case depth [that's .020" per side] on a .120" thick part, or area of a part.). This will result in a brittle condition.
- Do not specify "leave holes or internal threads soft" on a through-hardening material (A2, D2, O1, 4140, etc.). This only works when carburizing low-carbon steels (CRS, 1018, 8620, etc.)
- When specifying areas to be left soft on carburized material, your heat treater will pack holes with clay or paint external areas with a "no-carb" paint. This is very cost effective, but is not 100% effective in blocking out the carburizing effect. For 100% effectiveness on critical jobs, the customer must have the desired areas copper plated.
- At East-Lind Heat Treat, all air-hardening tool steels (A-2, D-2, H-13, etc.) are standard processed with a double temper.
- High alloy materials such as D-2 and A-2 may present several problems if sent for heat treatment in the "as-cast" condition. (Most notably, they will not attain maximum hardness and will be extremely brittle.)
- To reduce the risk of fracturing during the heat treat hardening process …
  · Avoid putting sharp inside corners into the design of a part.
  · Avoid designs that incorporate thin sections adjacent to thick sections (excessive changes in cross sectional thickness).
  · Avoid placing holes too close to each other or to an edge.
- The de-carb layer (or mill bark) on rough steel stock must be removed prior to hardening. On thru-hardening steels, this layer will not only remain soft wherever present, but will retard the heat treating quench enough to cause a softer than expected core hardness and possibly cause excessive distortion. On low carbon (carburizing grade) steels, the decarb layer can slow down the rate of carburization, thus affecting case depth in those areas.
- When rough machining, always remove stock evenly from all sides. Do not lightly clean up one side, then machine to size on the other. This creates excessive stress in one area and not another, often causing severe distortion during heat treatment.

Heat Treating Tips in General

When filling out your customer work order book and in order to avoid unnecessary delays in turnaround, always…

- Include your customer number to avoid confusion with other companies with similar names.
- Include the name of a contact person in the space provided.
- Include a good, positive description of your parts (accurate dimensions plus a quick sketch, stamped part numbers, etc.)

If you ever have parts returned to you from our delivery driver that are not yours, please notify East-Lind Heat Treat immediately so we can correct the problem for all parties concerned as quickly as possible.

Jobs to be certified must be marked as such on your incoming work order. Our certification process differs from our standard inspection process. Thus, once the parts leave East-Lind Heat Treat's building and go into service, they cannot simply be certified with a phone call.

East~Lind Heat Treat, Inc...Keeping You Competitive!

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Ph: (248) 585-1415 • Fax: (248) 585-3045
32045 Dequindre, Madison Heights, MI 48071
Between 13 & 14 Mile Roads
email: sales@eastlind.com