

- 1.0) The provisions of this bulletin are to be part of any engineering drawing and/or production sequence. These provisions may be called out specifically. However, if they are not specifically excepted they will presumed to apply.
- 2.0) ALNICO CASTINGS
  - 2.1) A melt record, MR 001, shall be maintained for each heat of cast Alnico. This melt record shall be saved in a legible condition for at least four years. The heats used for a specific order are to be indicated on that order, referenced by the heat number.
    - 2.1.1) A test bar will be poured from each heat, as required, and forwarded to the Quality Control department to determine the suitability of the alloy to meet the material requirements of the castings.
  - 2.2) The operations required to produce a casting will be described on the master routing sheet, FR 001, for each casting part number.
- 3.0) PHYSICAL INSPECTION
  - 3.1) In-process visual inspection of the castings from each heat shall be made to detect imperfections. Castings shall be scrapped for any of the following defects, with the quantity scrapped for each defect recorded on the heat sheet.
    - a. Cold shut
    - b. Excessive flash
    - c. Break-in
    - d. Excessive porosity
    - e. Mismatch
    - f. Cracks
  - 3.2) Suitable instruments (e.g. micrometers, gages, scales) shall be used to assure that the configuration of the casting will permit finishing to the part specifications and meets the specifications of the drawing.
  - 3.3) A file will be maintained in the Quality Control department for each casting part number. It is intended that this file provide a complete record of all activities concerning this casting. This file will include a copy of the pattern drawing and a "Pattern Inspection Record", PATCK 1. Additional copies of this form are to be completed when changes are made to the pattern.
  - 3.4) This file also will include a completed "First Article Inspection Report", IR 006. This is to be made when the casting is poured the first time, and whenever changes are made in the pattern, or when there are questions concerning the casting dimensions.
- 4.0) MAGNETIC INSPECTION
  - 4.1) Each heat of castings that requires a second quadrant hysteresis curve plotted by the permeameter. This plot will be made for each heat of castings as required, or whenever there is concern about the characteristics of the alloy used, and will be included in the file (Paragraph 3.3)
    - 4.1.1) The test bar furnished will be used for plotting the second quadrant hysteresis curve whenever the configuration of the casting is not suitable for the permeameter.

- 4.2) When testing suggests that there is a question about magnetic quality, a suitable material sample will be furnished to the analytical laboratory for spectrographic analysis. The results of this analysis will be included in this file (Paragraph 3.3).
- 4.3) A suitable magnetic standard will be established for each different casting. Inspection of the castings from each heat to this magnetic standard will be in accordance with MIL-STD-105, single sampling, level II. A record of the result of this magnetic inspection will be maintained on green form IR-2. This record will be included in the file (Paragraph 3.3) with the most recent copy first in the file. A "Reference" magnet, with acceptable magnetic characteristics, will be permanently retained in the Quality Control department.
- 4.4) When the magnetic inspection indicates that a heat is satisfactory, it may be mingled with other approved heats of the same casting for further processing, unless the order requires lot control be maintained.
- 4.5) When the magnetic inspection suggests a non-conforming heat, one of the following actions will be taken.
  - a. Entire heat will be scrapped.
  - b. Entire heat will be re-heat treated and then returned to the Quality Control department for re-inspection.
  - c. Entire heat will be 100% magnetic tested and non-conforming magnets will either be scrapped or re-heat treated and returned for inspection.
  - d. Entire heat will be kept separated from other in-process parts, and 100% magnetically tested before shipment (non-conforming magnets will be scrapped).
- 4.6) Only Quality Control department personnel shall transfer material from the Quality Control department to the appropriate area for further processing or shipment.

#### 5.0) SINTERED ALNICO MAGNETS

- 5.1) Visual and physical inspection of the magnets will be conducted during all production steps to assure that mechanical specifications are consistently maintained.
- 5.2) A file will be maintained in the Quality Control department on each sintered part number. It is intended that this file provide a complete record of all activities concerning this part number. This file will include a copy of the tooling drawing and a "Tooling Inspection Record", STIR 001. Additional copies of this form are to be completed when changes are made to the tooling.
- 5.3) This file also will include a completed "First Article Inspection Report", IR 006. This is to be made when the part is produced the first time, and whenever changes are made in the tooling or there are questions about the part dimensions.
- 5.4) Magnet inspection similar to the provisions of paragraph 4.1 through 4.6 will be conducted before further processing of sintered parts.

#### 6.0) RARE-EARTH MAGNETS

- 6.1) The provisions of paragraph 5.1 through 5.4 for SINTERED ALNICO MAGNETS, above, will apply to rare-earth magnets