

# Quantitative Quality Indicators (QQIs)

## Test Piece Shims

QQIs are artificial flaw (notched) shims that are attached to example parts, commonly used to demonstrate both field strength and direction within a part.

Available in several different configurations, QQIs are thin steel shims with etched patterns in circular and cross shapes to provide indications in all directions.

The steel alloy and notch dimensions, as specified in AS 5371, are designed to provide indications when the base part is magnetized to at least 30 gauss. The thin shims can conform to curved part surfaces, and they are typically affixed to a part using permanent adhesives.

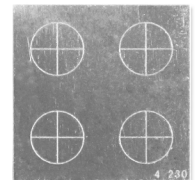
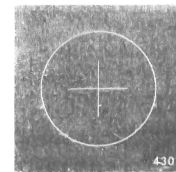
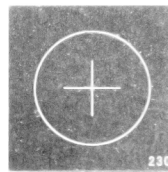
QQIs are useful for setting up the magnetization parameters for part-specific techniques, and can be used to create an example part for the daily system performance check of the magnetizing equipment.

They are very important for the setup and balance of multi-directional fields, since they have circular flaws that show indications in all directions simultaneously.

### INSTRUCTIONS

Leave the hermetically-sealed package intact until ready to use. Shims are manufactured of low carbon steel and must be protected from corrosion when not in use. To prevent corrosion, the QQIs are coated with a refined mineral base oil and stored in the protective plastic packaging.

Prior to use, the protective coating shall be removed from both faces of the QQI using SKC-S, acetone, or a suitable solvent.



The part and shim must be clean and dry before application. Place the QQI flawside-down in intimate contact with the part being investigated and securely fasten it down on all four sides. To attach the QQIs, use non-fluorescent tape (for example, Scotch brand 191, 471 or 600 series), a strong permanent adhesive such as cyanoacrylate (Super Glue or equivalent), or the Magnaflux supplied test shim stickers. The latter may be removed by soaking in acetone.

Be sure that the surface opposite the flaw is not covered and that no air gap exists between the indicator and the part. When using the indicator as a process control part, ensure that there is no adhesive covering the indicator itself. This method is also applicable when the indicator is left in place in preventative maintenance applications.

Store the QQIs in solvent after use. For more details, please refer to ASTM E1444.

### MULTI-DIRECTIONAL FIELDS

Multi-directional applications are determined by setting the amperage of each direction individually, then balancing the fields when applied together.

- For each field direction, slowly increase the amperage until a visible indication is achieved.
- Demagnetize the part and clean the QQIs between each field direction.
- In multi-directional mode, begin with the amperage settings determined individually. To balance the fields, adjust the amperage of each direction as needed until the entire circle of the QQI is visible.

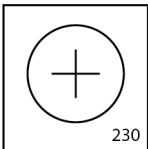
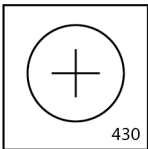
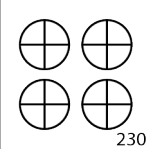
NOTE: QQIs do not hold residual fields. Continuous magnetization methods will produce the best results.

### SPECIFICATIONS

- AS 5371
- ASME BPVC Section V Article 7
- ASTM E709
- ASTM E1444
- ASTM E3024

### PART NUMBERS

- |        |                   |
|--------|-------------------|
| 631590 | CX-230, set of 5  |
| 631591 | CX-430, set of 5  |
| 631592 | CX4-230, set of 5 |

<p>CX-230</p> 	<p>0.75 inch (19 mm) square shim with circle-cross notch pattern, 0.002 inch (0.05 mm) thickness with a notch depth of 30% of shim thickness.</p>
<p>CX-430</p> 	<p>0.75 inch (19 mm) square shim with circle-cross notch pattern, 0.004 inch (0.10 mm) thickness with a notch depth of 30% of shim thickness.</p>
<p>CX4-230</p> 	<p>0.79 inch (20 mm) square shim with four circle-cross notch patterns, to be cut by user into four separate shims. 0.002 inch (0.05 mm) thickness with a notch depth of 30% of shim thickness.</p>