

**PLYMOUTH TUBE CO****MATERIAL TEST REPORT**

572 W. State Road 14 Winamac, IN 46996

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QS-9000: 1998 and ISO 9002: 1994 & ANSI/ASQC Q9002-1994 Quality Management System  
Registered by RVC & ANSI-RAB ABS-QE ISO 9000 Certificate # 30296 (Jul/22/93)

|                                                                                                                                                |                           |                                                               |                                            |                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date: 08/20/01                                                                                                                                 | Customer P.O.: 4500063620 | Order No: 22-34997                                            | Signature: <i>[Signature]</i> Sr. Lab Tech | Page: 1 of 1                                                                                                                                          |
| Customer:<br><br>REMINGTON ARMS COMPANY<br>RESEARCH & DEVELOPMENT<br><br>ELIZABETHTOWN KY 42701                                                |                           | Specification(s):<br>ASTM A-519-96 GR:1010<br><br>Grade: 1010 |                                            | Melt Source:<br>KOPPEL STEEL<br><br>Method of Manufacture:<br>ELECTRIC ARC FURNACE MELTED<br>CONTINUOUS CAST<br>SILICON KILLED<br>COLD DRAWN SEAMLESS |
| Product Description:<br>1.442" OD X .321" NOM WA<br>REMINGTON DRAWING B-EXP7483<br>REF: PO# 399002<br>TRIAL ORDER- TRI-LOBE TUBE PER OFFER "B" |                           | UNANNEALED                                                    |                                            | NDE & Other Tests:                                                                                                                                    |

**CHEMICAL COMPOSITION (% WT.)**

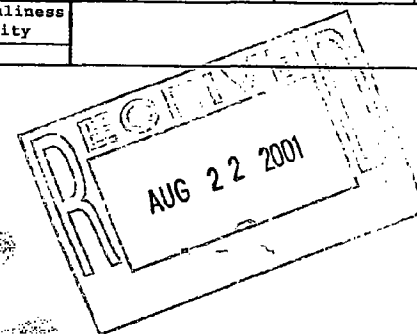
| Heat No. | Sample | C   | Mn  | P    | S    | Si  | Al   | Cr  | Mo  | Ni  | Pb | Cu  | V    | Ti | Sn   | Zn | Ca | O | N     |
|----------|--------|-----|-----|------|------|-----|------|-----|-----|-----|----|-----|------|----|------|----|----|---|-------|
| 431051   | Ladle  | .09 | .46 | .007 | .010 | .19 | .018 | .11 | .02 | .09 |    | .16 | .003 |    | .009 |    |    |   | .0090 |
|          | Check  | .10 | .46 | .007 | .010 | .19 | .016 | .11 | .02 | .09 |    | .16 | .003 |    | .009 |    |    |   | .0089 |

**MECHANICAL PROPERTIES**

| Heat No. | Tensile (ksi) | Yield (ksi) | %Elong (in 2") | %R/A | Tensile (ksi) | Yield (ksi) | %Elong (in 2") | %R/A | Hardness (Rb) | Flat | Rev. Flat | Flare | Flange | Expand | Bend | Crush |
|----------|---------------|-------------|----------------|------|---------------|-------------|----------------|------|---------------|------|-----------|-------|--------|--------|------|-------|
| 431051   |               |             |                |      |               |             |                |      | 90 90         |      |           |       |        |        |      |       |

**METALLURGICAL PROPERTIES**

| Heat No. | Jominy Hardenability Results |    |    |    |    |    |    |    |             |        | MacroEtch Results         |          |   | Grain Size | Decarburization |    |
|----------|------------------------------|----|----|----|----|----|----|----|-------------|--------|---------------------------|----------|---|------------|-----------------|----|
|          | J1                           | J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9          | J10    | S                         | R        | C | 7          | OD              | ID |
| 431051   |                              |    |    |    |    |    |    |    |             |        |                           |          |   |            |                 |    |
| Heat No. | Microcleanliness Ratings     |    |    |    |    |    |    |    | SAM Ratings |        | Mag. Particle Cleanliness |          |   |            |                 |    |
|          | AT                           | AK | BT | BH | CT | CH | DT | DH | B-Type      | D-Type | Frequency                 | Severity |   |            |                 |    |
| 431051   |                              |    |    |    |    |    |    |    |             |        |                           |          |   |            |                 |    |



Material was manufactured in accordance with the Winamac Quality System Manual Revision 1, dated 9/1/00. We hereby certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

Confidential - Subject to Protective Order  
Williams V. Remington

ET35125