TYCOONS TYCOONS WORLDWIDE GROUP (THAILAND) PUBLIC CO.,LTD
99 Moo 1, Sai-Ek Rd., Tumbon Nikompattana Amphur Nikompattana, Rayong 21180 Thailand

# INSPECTION REPORT

**NO. : 131218063**

**CUSTOMER :** ENGINEERED COMPONENTS COMPANY
**ADDRESS :** 1100 Davis Road
Elgin, IL 60123, USA
TEL :+ 847-841-7000
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**INVOICE NO. :** T13110163
**ORDER NO. :** AH102113
**P.I. NO. :** TH3110231
**PART NO. :**

**PRODUCT DESCRIPTION :** HEX HEAD CAP SCREWS ASME B18.2.1 NONE RECESS INCH HEX HEAD (G5) WASHER FACE NC COARSE THREAD 13 TPI (FULL THREAD) ,HEAT TREAT PER SAE J429,BLACK PLAIN WITH ANTI-RUST OIL

**SIZE :** 1/2-13x1-1/2 **LOT NO. :** B812HP273A **SAMPLING PLAN :** ANSI/ASME B18.18.2M
**HEAT NO. :** 07204971 **MATERIAL :** 10B33 **TEST DATE :** 22/11/2008
**LOT SIZE :** 110,584 **PCS** **SHIP QTY. :** 32,400 **PCS** **MANUFACTURING DATE :** 15/10/2008
**MANUFACTURER. :** TYCOONS WORLDWIDE GROUP (THAILAND) PUBLIC CO.,LTD.

**DIMENSIONAL INSPECTIONS PER :** ASME B18.2.1 **INSPECTOR :** MS.VIMOL SAIMO

| INSPECTION ITEM | SAMPLE SIZE | SPECIFIED | ACTUAL RESULT | PASS |
|---|---|---|---|---|
| HEAD MARK | 100 PCS | TY G5 | TY G5 | OK |
| APPEARANCE | 100 PCS | ASTM F788 | OK | OK |
| THREAD | 32 PCS | ANSI B1.1 NC2A | OK | OK |
| WIDTH ACROSS FLAT | 32 PCS | .736 ~ .750 | .740 ~ .741 | OK |
| WIDTH ACROSS CORNER | 8 PCS | .840 ~ .866 | .847 ~ .848 | OK |
| HEAD HEIGHT | 8 PCS | .302 ~ .323 | .312 ~ .313 | OK |
| MAJOR DIAMETER | 32 PCS | .488 ~ .498 | .495 ~ .496 | OK |
| LENGTH | 32 PCS | 1.440 ~ 1.500 | 1.463 ~ 1.464 | OK |

**MECHANICAL PROPERTIES PER :** SAE J429 **INSPECTOR :** MS.NANTAKA CHAIYA

| INSPECTION ITEM | SAMPLE SIZE | TEST METHOD | SPECIFIED | TEST VALUE | PASS |
|---|---|---|---|---|---|
| TENSILE STRENGTH | 4 PCS | ASTM F606 | min. 120,000 psi | 136,696 ~ 141,425 | OK |
| SURFACE HARDNESS | 8 PCS | ASTM F606 | max. 54 HR30N | 51.0 ~ 53.4 | OK |
| CORE HARDNESS | 8 PCS | ASTM F606 | 25 ~ 34 HRC | 29.6 ~ 31.7 | OK |

**REMARK :**
1. CERTIFICATES OF REPORTS SHOULD NOT BE PARTIALLY COPIED UNLESS OBTAIN WRITTEN PERMIT FROM LABORTORY FULL COPY IS NOT INCLUDED.
2. ALL DIMENSIONS IN THIS CERTIFICATE ARE IN inch , UNLESS STATED OTHERWISE.
3. ABOVE SAMPLES TESTED CONFORM TO THE FASTENER SPECIFICATION OR STANDARDS.
4. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

**LAB. DIRECTOR (SIGNATURE) :** Moses

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(RM1230R)

# Certificate of Material

| Customer / Address | SCREW & WIRE PLANT<br>TYCOONS WORLDWIDE GROUP (THAILAND) PUBLIC CO., LTD. | Customer No. | Certificate No | Issue Date |
|---|---|---|---|---|
| Products | Carbon Steel Wire Rod | 404 | S0807141 | 14-07-2008 |

| S/L No. | Order No-Item | Specification | Steel Grade | Dia (mm.) | Rolling No. | Heat No | Quantity (Coils) | Weight (Kgs) Net | Weight (Kgs) Gross | Process | Process Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | N08060011-1 | JIS G 3507 | SWRCH22A-C | 6.5 | 570377 | 08703256 | 1 | - | 2,069 | HR | HR Hot Rolled |
| 32 | N08060011-1 | JIS G 3507 | SWRCH22A-C | 6.5 | 570378 | 08703273 | 1 | - | 2,066 | HR | |
| 33 | N08060011-1 | JIS G 3507 | SWRCH22A-C | 6.5 | 570380 | 08703277 | 2 | - | 4,094 | HR | |
| 34 | N08070011-1 | ASTM A 510 | 10B33 | 12.0 | 842706 | 07608773 | 1 | - | 1,594 | HR | |
| 35 | N08070011-1 | ASTM A 510 | 10B33 | 12.0 | 872808 | 07204971 | 21 | - | 35,550 | HR | |
| 36 | N08060039-1 | ASTM A 510 | 1541 | 12.0 | 872815 | 462717 | 21 | - | 43,354 | HR | |
| 37 | N08070001-2 | ASTM A 510 | 1541 | 12.0 | 872815 | 462717 | 22 | - | 45,402 | HR | |
| 38 | A08070006-2 | JIS G 3507 | SWRCH12A | 12.0 | 872806 | 08704004 | 10 | - | 14,666 | HR | |
| 39 | A08070002-1 | JIS G 3505 | SWRM8K | 7.0 | 821810 | S70809 | 1 | - | 1,628 | HR | |
| 40 | A08070002-1 | JIS G 3505 | SWRM8K | 7.0 | 860701 | 10156 | 14 | - | 21,734 | HR | |
| | | | | | | Total : | 185 | | 355,152 | | |

## Mechanical Properties

| S/L No. | Tensile Strength (N/mm²) Min | Avg | Max | Elongation (%) Min | Avg | Max | Reduction of Area (%) Min | Avg | Max |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | 490.00 | | | | | | 62.50 | |
| 32 | | 515.00 | | | | | | 65.00 | |
| 33 | | 475.00 | | | | | | 66.00 | |
| 34 | | 641.83 | | | 23.24 | | | 58.00 | |
| 35 | | 603.01 | | | 23.21 | | | 60.25 | |
| 36 | | 786.31 | | | 19.78 | | | 57.75 | |
| 37 | | 788.31 | | | 19.79 | | | 57.75 | |
| 38 | | 363.07 | | | 32.50 | | | 74.00 | |
| 39 | | 472.62 | | | 31.79 | | | 70.00 | |
| 40 | | 459.59 | | | 31.69 | | | 72.80 | |

## Chemical Composition (%)

| C | Si | Mn | P | S | Al | Cr | B |
|---|---|---|---|---|---|---|---|
| 0.190 | 0.050 | 0.810 | 0.021 | 0.010 | 0.034 | | |
| 0.180 | 0.040 | 0.760 | 0.014 | 0.006 | 0.053 | | |
| 0.190 | 0.050 | 0.840 | 0.010 | 0.011 | 0.024 | | |
| 0.350 | 0.220 | 0.750 | 0.011 | 0.016 | | | 0.002 |
| 0.330 | 0.240 | 0.820 | 0.012 | 0.005 | | | 0.002 |
| 0.368 | 0.210 | 1.420 | 0.019 | 0.011 | | | |
| 0.368 | 0.210 | 1.420 | 0.019 | 0.011 | | | |
| 0.130 | 0.040 | 0.380 | 0.007 | 0.010 | 0.037 | | |
| 0.100 | 0.180 | 0.500 | 0.020 | 0.026 | | | |
| 0.100 | 0.190 | 0.530 | 0.016 | 0.044 | | | |

ROLLING MILL

We hereby certify that the material described herein have been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification.

**Remark**

Manager of Quality Assurance

**Checked By :**

**Issued By :**