

Materials Testing

Report No: EAKLMT-00006681

Page 1 of 10

Monday, 28 August 2017

REPORT

TITLE: Tensile Bullet pull Test.

CLIENT'S DETAILS: Amp Annealing.

CLIENT'S REFERENCE: S/O: 5048521 0010, P/O: AMP220517

TEST SPECIFICATION: N/A

RESULTS SUMMARY: To be evaluated by Amp annealing.

INTRODUCTION

Seven batches of five samples were presented for Tensile Testing, as requested by Amp Annealing. The samples were identified as follows:

Brass: Norma 308W. Lot# 100019603. Neck wall: 0.0132" +/-0.0003" (no turn)
All case mouths chamfered. All cases stainless steel tumbled 4 hours prior to preparation.
Lube: As specified.
Projectile: Hornady 178gr ELD-X Lot# 2162027 COAL:2.81"

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 2 of 10

Monday, 28 August 2017

The sample batches were identified as follows:

Pack 1: Shot x 1 / anneal x 1 / dry lube / neck die

Pack 2: Shot x 2 / anneal x 2 / spray lube / neck die

Pack 3: Shot x 2 / anneal x 2 / dry lube / bushing die (2)

Pack 4: Shot x 4 / anneal x 3 (no anneal this cycle) / dry lube / bushing die (2)

Pack 5: Shot x 11 / annealed x 11 / dry lube / bushing die (2)

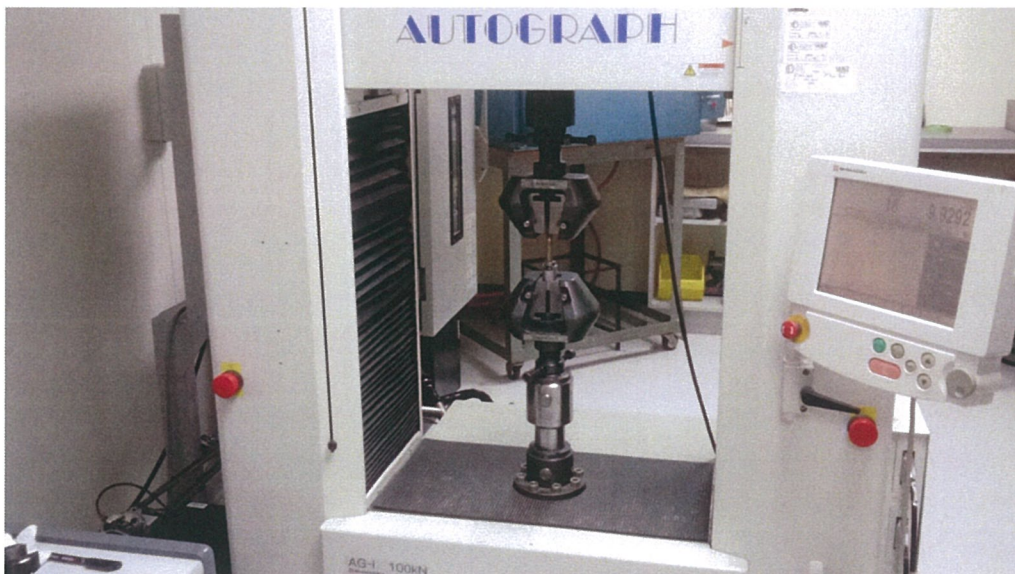
Pack 6: Shot x 2 / dry lube / neck die / anneal x 2

Pack 7: Shot x 2 / spray lube / neck die / anneal x 2

METHOD

The samples were tested individually on a Shimadzu AG-I universal testing machine, Equipment No: 40026389 using a locally manufactured holding fixture.

The results were collated and presented to Amp Annealing for evaluation.



Sample set up in Tensile testing machine

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 3 of 10

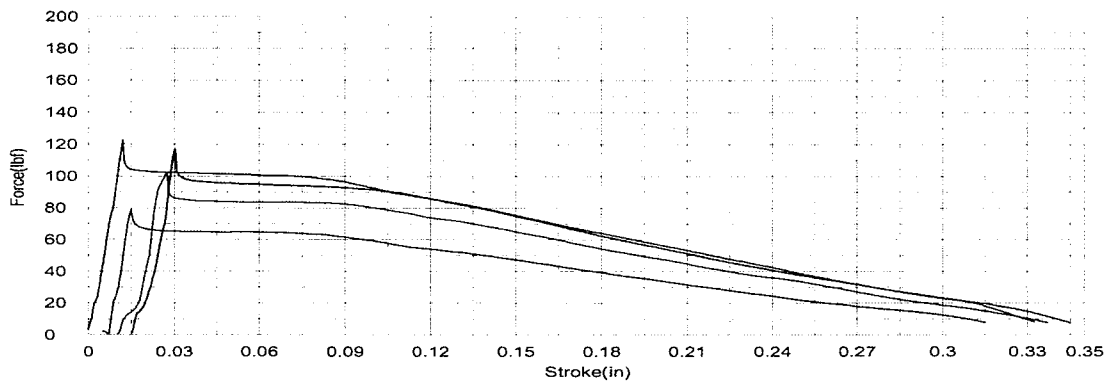
Monday, 28 August 2017

RESULTS

Cartridge Tensile Test

| Shape: Rod | | |
|------------|----------------|--------------------|
| Units | Diameter in | Gauge Length in |
| Pack 1-1 | 1.0000 | 100.0000 |
| Pack 1-2 | 1.0000 | 100.0000 |
| Pack 1-3 | 1.0000 | 100.0000 |
| Pack 1-4 | 1.0000 | 100.0000 |

| Name Units | Max_Force lbf |
|---------------|------------------|
| Pack 1-1 | 122.827 |
| Pack 1-2 | 79.2204 |
| Pack 1-3 | 102.288 |
| Pack 1-4 | 116.983 |
| Mean | 105.330 |
| Total Mean | 105.330 |



Comment
Pack 1: Shot x 1 / anneal x 1 / dry lube / neck die

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 4 of 10

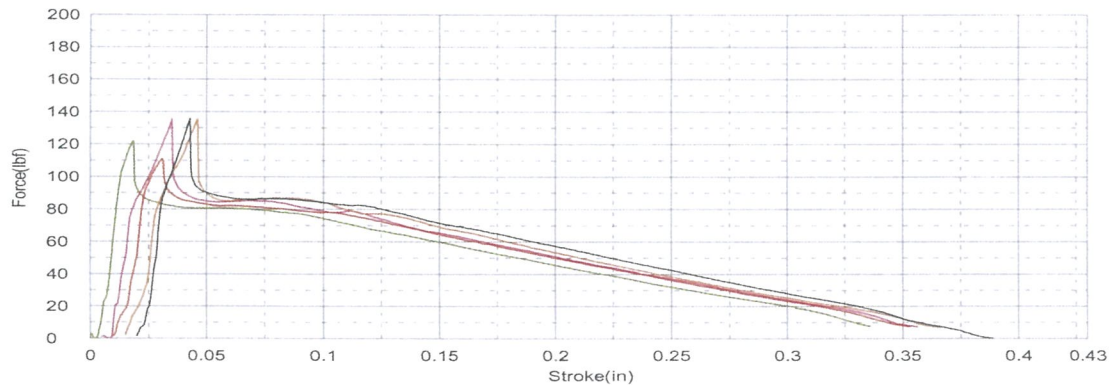
Monday, 28 August 2017

Cartridge Tensile Test

Shape: Rod

| Units | Diameter in | Gauge Length in |
|----------|----------------|--------------------|
| Pack 2-1 | 1.0000 | 100.0000 |
| Pack 2-2 | 1.0000 | 100.0000 |
| Pack 2-3 | 1.0000 | 100.0000 |
| Pack 2-4 | 1.0000 | 100.0000 |
| Pack 2-5 | 1.0000 | 100.0000 |

| Name Units | Max_Force lbf |
|---------------|------------------|
| Pack 2-1 | 121.858 |
| Pack 2-2 | 135.865 |
| Pack 2-3 | 111.055 |
| Pack 2-4 | 135.893 |
| Pack 2-5 | 135.879 |
| Mean | 128.110 |
| Total Mean | 128.110 |



Comment

Pack 2: Shot x 2 / anneal x 2 / spray lube / neck die

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 5 of 10

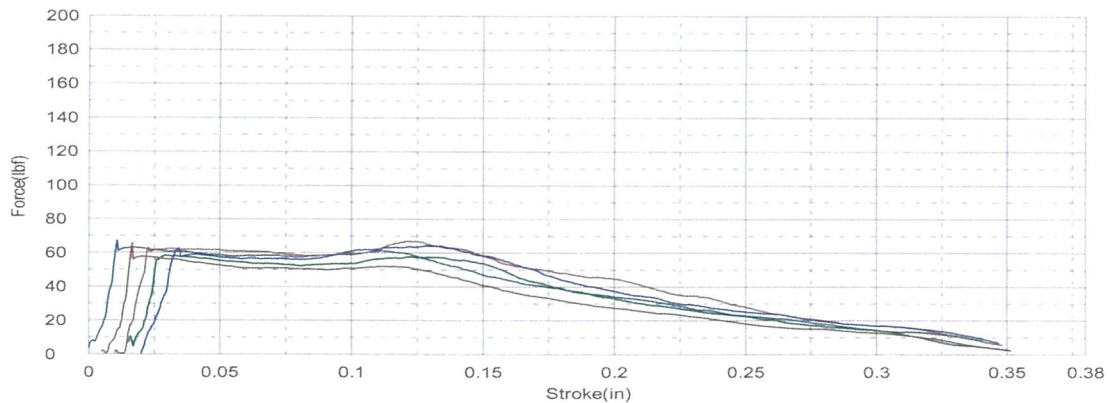
Monday, 28 August 2017

Cartridge Tensile Test

Shape: Rod

| Units | Diameter in | Gauge Length in |
|----------|----------------|--------------------|
| Pack 3-1 | 1.0000 | 100.0000 |
| Pack 3-2 | 1.0000 | 100.0000 |
| Pack 3-3 | 1.0000 | 100.0000 |
| Pack 3-4 | 1.0000 | 100.0000 |
| Pack 3-5 | 1.0000 | 100.0000 |

| Name | Max_Force lbf |
|------------|------------------|
| Pack 3-1 | 67.2510 |
| Pack 3-2 | 66.0849 |
| Pack 3-3 | 67.1386 |
| Pack 3-4 | 58.4846 |
| Pack 3-5 | 64.2445 |
| Mean | 64.6407 |
| Total Mean | 64.6407 |



Comment

Pack 3: Shot x 2 / anneal x 2 / dry lube / bushing die (2)

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 6 of 10

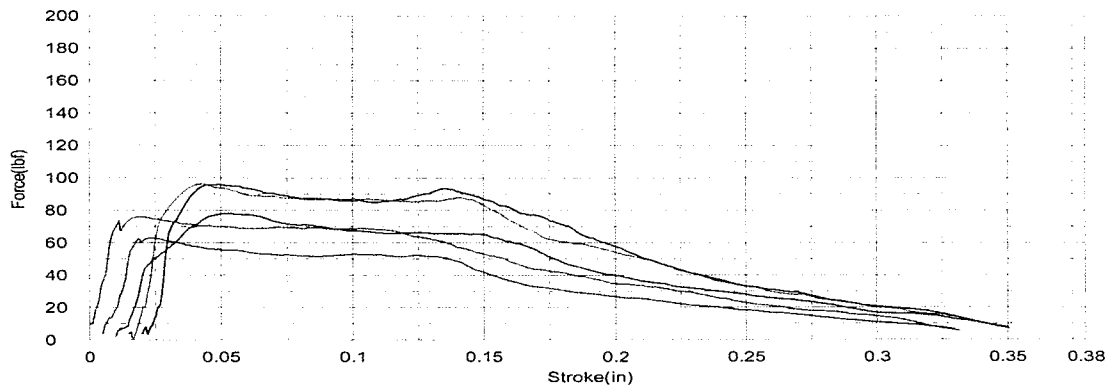
Monday, 28 August 2017

Cartridge Tensile Test

Shape: Rod

| Units | Diameter in | Gauge Length in |
|----------|----------------|--------------------|
| Pack 4-1 | 1.0000 | 100.0000 |
| Pack 4-2 | 1.0000 | 100.0000 |
| Pack 4-3 | 1.0000 | 100.0000 |
| Pack 4-4 | 1.0000 | 100.0000 |
| Pack 4-5 | 1.0000 | 100.0000 |

| Name Units | Max_Force lbf |
|---------------|------------------|
| Pack 4-1 | 76.1157 |
| Pack 4-2 | 62.9942 |
| Pack 4-3 | 78.0684 |
| Pack 4-4 | 96.3317 |
| Pack 4-5 | 96.0929 |
| Mean | 81.9206 |
| Total Mean | 81.9206 |



Comment

Pack 4: Shot x 4 / anneal x 3 (no anneal this cycle) / dry lube / bushing die (2)

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 7 of 10

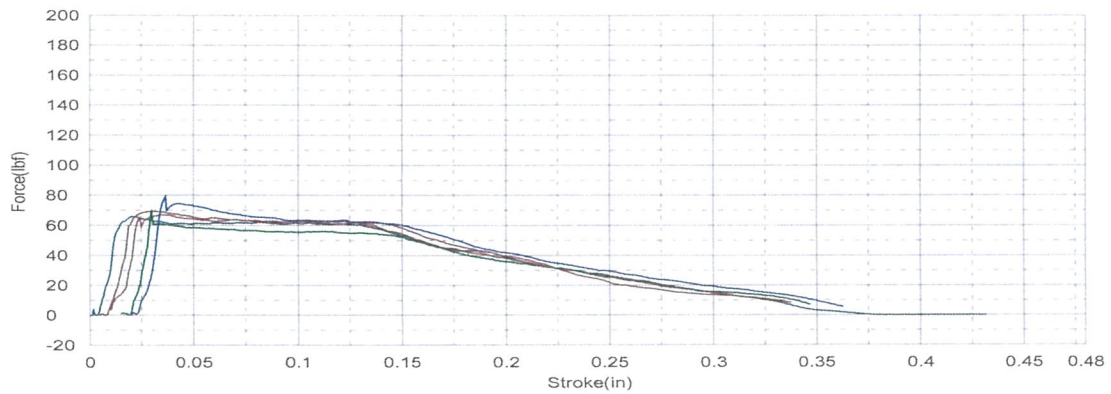
Monday, 28 August 2017

Cartridge Tensile Test

Shape: Rod

| Units | Diameter in | Gauge Length in |
|----------|----------------|--------------------|
| Pack 5-1 | 1.0000 | 100.0000 |
| Pack 5-2 | 1.0000 | 100.0000 |
| Pack 5-3 | 1.0000 | 100.0000 |
| Pack 5-4 | 1.0000 | 100.0000 |
| Pack 5-5 | 1.0000 | 100.0000 |

| Name | Max_Force lbf |
|------------|------------------|
| Pack 5-1 | 66.0568 |
| Pack 5-2 | 69.4847 |
| Pack 5-3 | 67.0683 |
| Pack 5-4 | 70.2012 |
| Pack 5-5 | 79.6138 |
| Mean | 70.4850 |
| Total Mean | 70.4850 |



Comment

Pack 5: Shot x 11 / anneal x 11 / dry lube / bushing die (2)

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

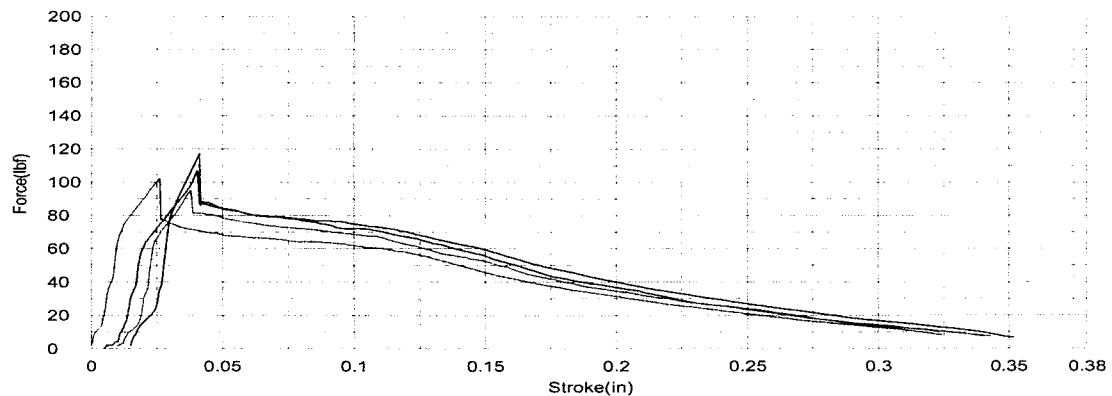
Page 8 of 10

Monday, 28 August 2017

Cartridge Tensile Test

| Shape: Rod | | |
|------------|----------------|--------------------|
| Units | Diameter in | Gauge Length in |
| Pack 6-1 | 1.0000 | 100.0000 |
| Pack 6-3 | 1.0000 | 100.0000 |
| Pack 6-4 | 1.0000 | 100.0000 |
| Pack 6-5 | 1.0000 | 100.0000 |

| Name Units | Max_Force lbf |
|---------------|------------------|
| Pack 6-1 | 102.148 |
| Pack 6-3 | 107.149 |
| Pack 6-4 | 95.3623 |
| Pack 6-5 | 117.363 |
| Mean | 105.506 |
| Total Mean | 105.506 |



Comment
Pack 6: Shot x 2 / dry lube / neck die / anneal x 2

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 9 of 10

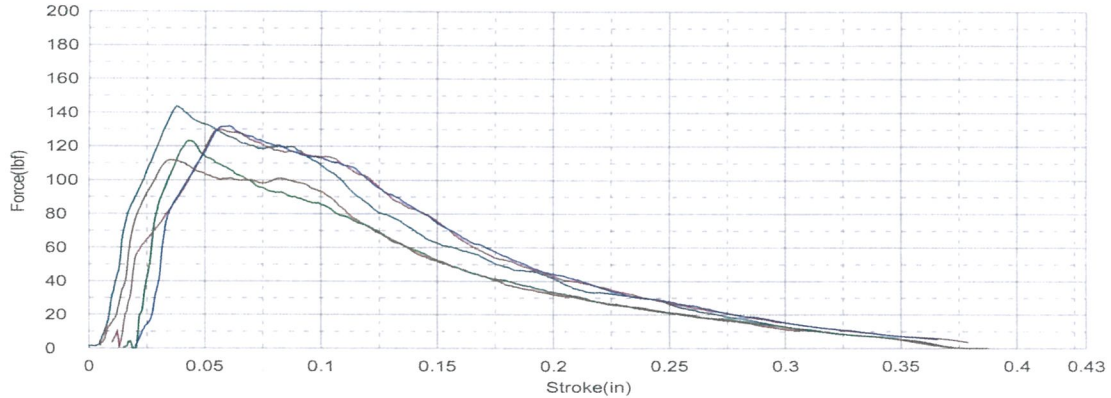
Monday, 28 August 2017

Cartridge Tensile Test

Shape: Rod

| Units | Diameter in | Gauge Length in |
|----------|----------------|--------------------|
| Pack 7-1 | 1.0000 | 100.0000 |
| Pack 7-2 | 1.0000 | 100.0000 |
| Pack 7-3 | 1.0000 | 100.0000 |
| Pack 7-4 | 1.0000 | 100.0000 |
| Pack 7-5 | 1.0000 | 100.0000 |

| Name Units | Max_Force lbf |
|---------------|------------------|
| Pack 7-1 | 143.634 |
| Pack 7-2 | 111.912 |
| Pack 7-3 | 130.147 |
| Pack 7-4 | 123.277 |
| Pack 7-5 | 131.945 |
| Mean | 128.183 |
| Total Mean | 128.183 |



Comment

Pack 7: Shot x 2 / spray lube / neck die / anneal x 2

This Report must not be quoted except in full.

Materials Testing

Report No: EAKLMT-00006681

Page 1 of 10

Monday, 28 August 2017

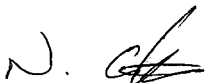
Notes: Pack 1, sample #5 and Pack 6, sample #2 results were omitted due to error during processing.

CONCLUSION

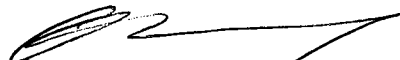
All relevant data collated and presented to Amp Annealing for evaluation

Prepared By:

Checked By:



Nick Casterton
Materials Testing Engineer
Authority No: 46684



Owen Bradley
Materials Testing Technician
Authority No: 49923

This Report must not be quoted except in full.