

ROC Naval Academy Ship Material Laboratory  
Construction Project(2020.10.30)

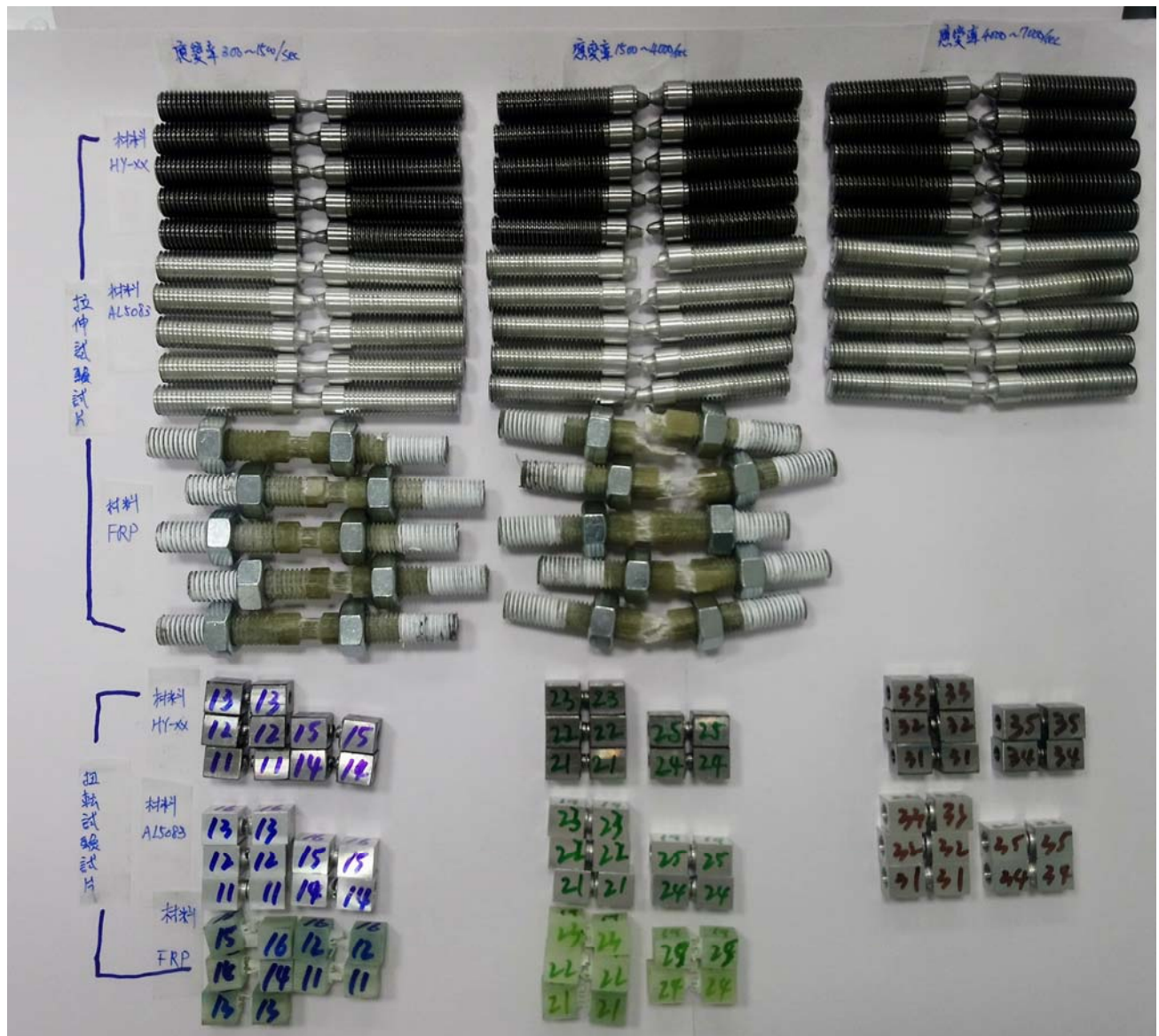
Item 1、Material high strain rate dynamic  
property test unit

Test Data (1/6)

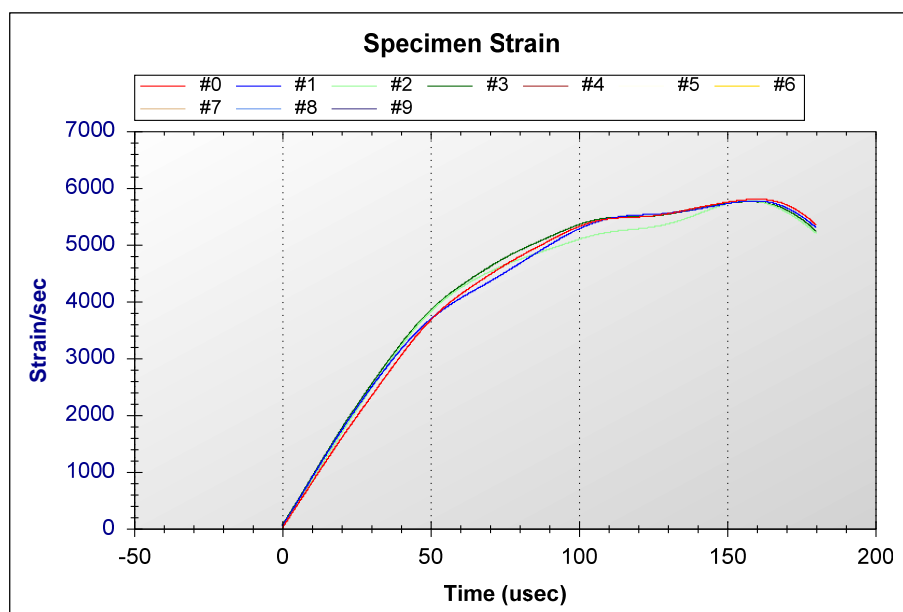
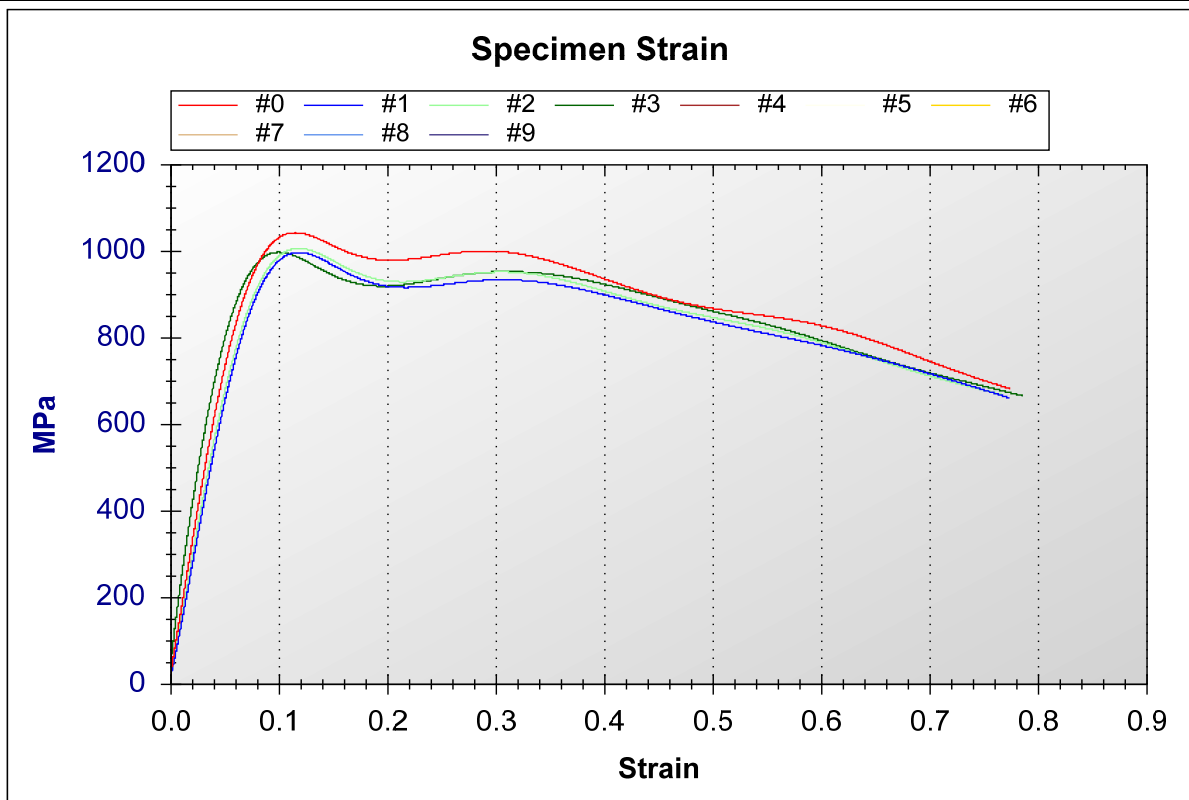


|             |   |                           |
|-------------|---|---------------------------|
| Project     | ROC Naval Academy Ship Material Laboratory<br>Construction Project (PS08040P) | Report Mo : 0804P_Tensile |
| Depiction   | Performance Test Standard<br>Material High Strain Rate performance test unit  | Date : 2020/10/06~08      |
| Test Item   | Tensile   | Report SN : (1/3)         |
| Material    | Metal high-strength steel for submarine HY-80                                 |                           |
| Strain Rate | 300~1500/sec , 1500~4000/sec , 4000~7000/sec                                  |                           |
| Apparatus   | Tensile Split Hopkinson Bar Tester  | Tester : Nelson/Edward    |

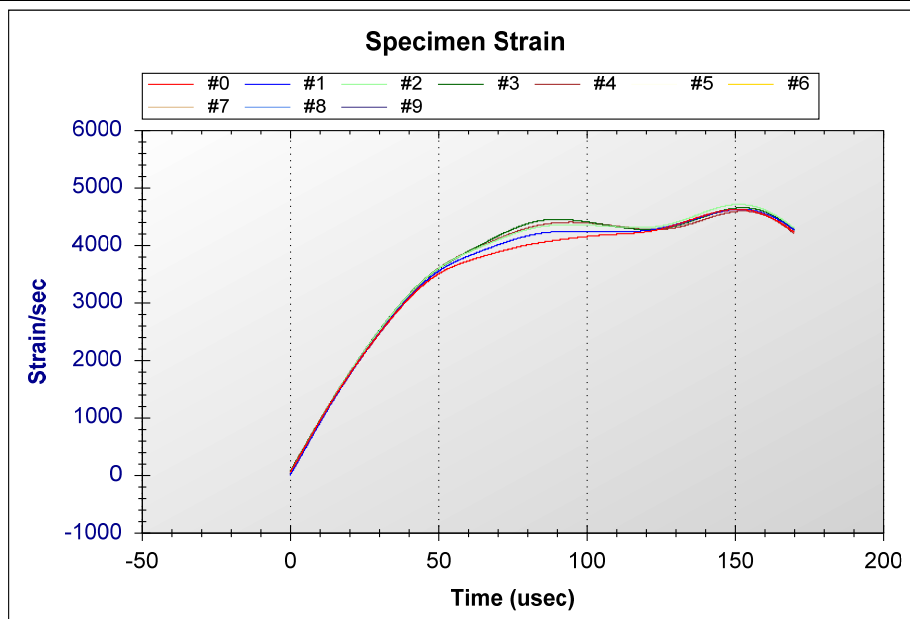
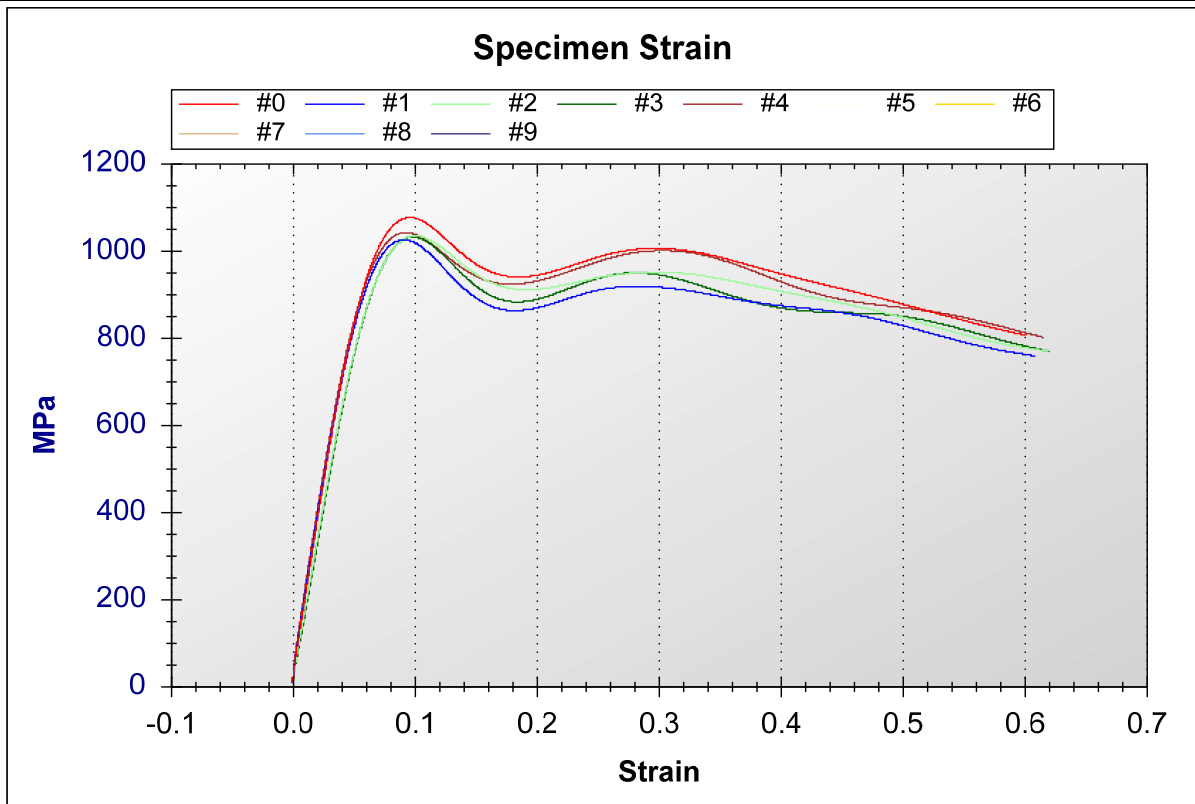
### Tets Piece



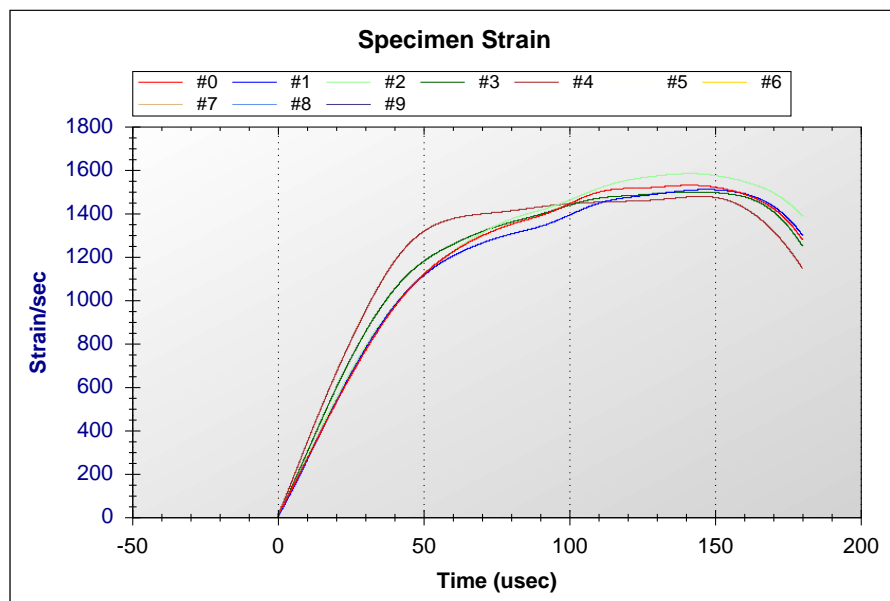
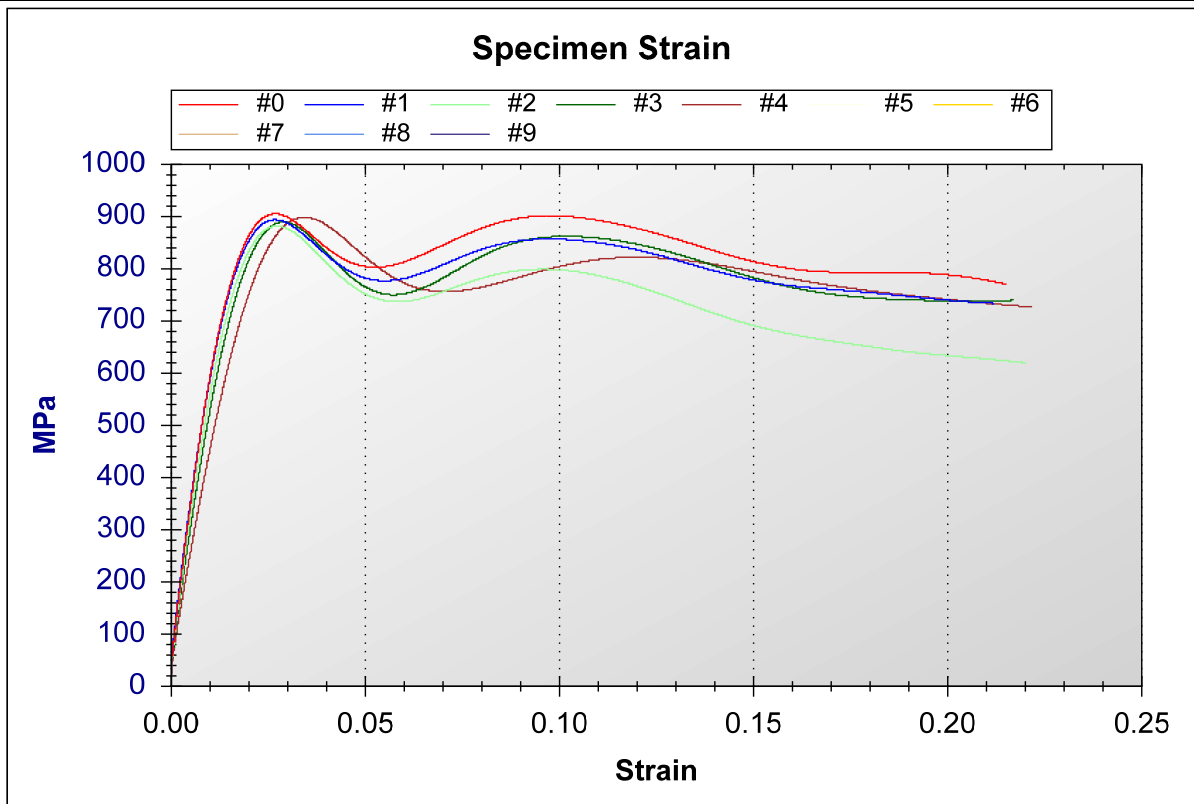
| Test Piece No. | Dimension<br>(D*L mm) |   | Gun Press.<br>(kg/cm <sup>2</sup> ) | Strain Rate<br>(Strain/sec) | UTS (MPa) | UE (%) |
|----------------|-----------------------|---|-------------------------------------|-----------------------------|-----------|--------|
| #1             | 7                     | 3 | 3.3                                 | 4234                        | 1020      | 72     |
| #3             |                       |   | 3.3                                 | 4200                        | 1029      | 74     |
| #4             |                       |   | 3.3                                 | 4316                        | 1029      | 73     |
| #5             |                       |   | 3.3                                 | 4306                        | 1021      | 74     |
| #6             |                       |   | 3.3                                 | 4234                        | 1020      | 72     |
| Average        | 7                     | 3 | 3.3                                 | 4258                        | 1023.8    | 73     |
| Repeatability  |                       |   |                                     | 1.4%                        | 0.4%      | 1.4%   |



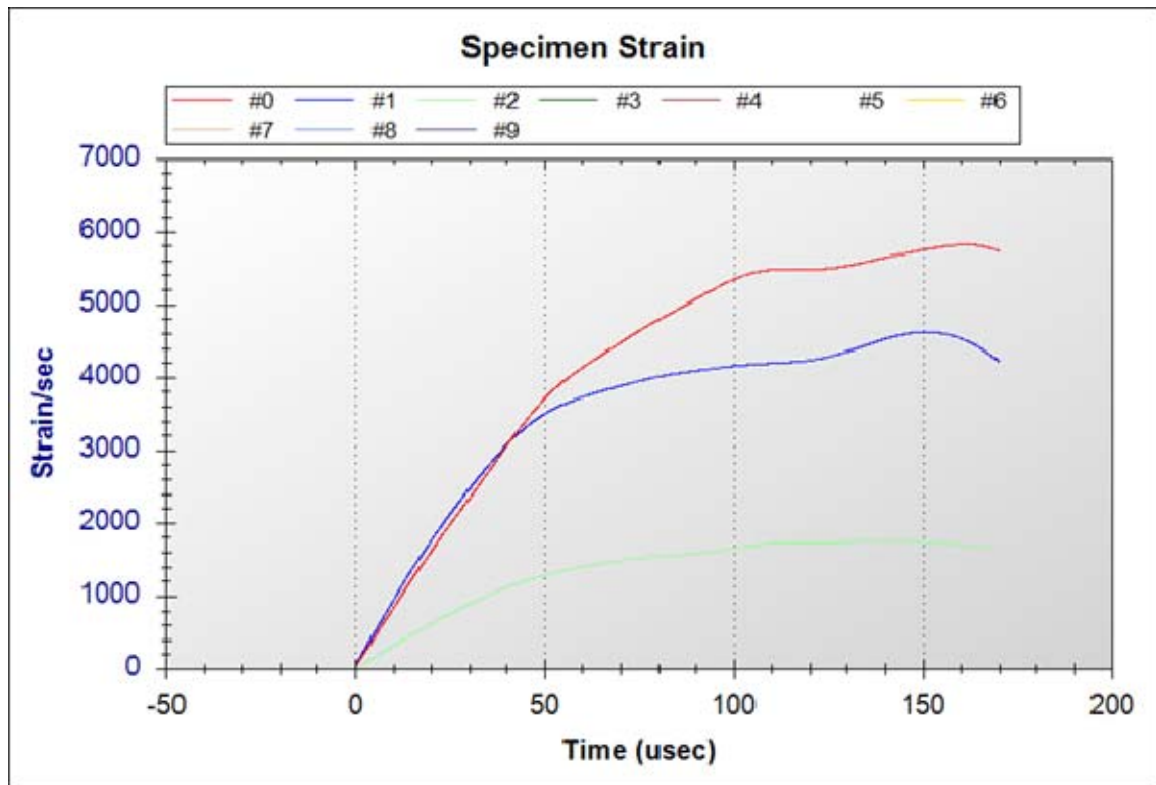
| Test Piece No. | Dimension<br>(D*L mm) |   | Gun Press.<br>(kg/cm <sup>2</sup> ) | Strain Rate<br>(Strain/sec) | UTS (MPa) | UE (%) |
|----------------|-----------------------|---|-------------------------------------|-----------------------------|-----------|--------|
| #10            | 7                     | 3 | 2.5                                 | 3541                        | 1075      | 60     |
| #11            |                       |   | 2.5                                 | 3583                        | 1025      | 61     |
| #12            |                       |   | 2.5                                 | 3649                        | 1033      | 62     |
| #13            |                       |   | 2.5                                 | 3653                        | 1031      | 62     |
| #14            |                       |   | 2.5                                 | 3622                        | 1041      | 62     |
| Average        | 7                     | 3 | 2.5                                 | 3610                        | 1041      | 61.4   |
| Repeatability  |                       |   |                                     | 1.6%                        | 0.4%      | 1.4%   |



| Test Piece No. | Dimension<br>(D*L mm) |   | Gun Press.<br>(kg/cm <sup>2</sup> ) | Strain Rate<br>(Strain/sec) | UTS (MPa) | UE (%) |
|----------------|-----------------------|---|-------------------------------------|-----------------------------|-----------|--------|
| #20            | 5.5                   | 5 | 1.5                                 | 1357                        | 934       | 23     |
| #21            |                       |   | 1.5                                 | 1333                        | 922       | 22     |
| #22            |                       |   | 1.5                                 | 1386                        | 911       | 24     |
| #23            |                       |   | 1.5                                 | 1372                        | 923       | 23     |
| #24            |                       |   | 1.5                                 | 1410                        | 929       | 24     |
| Average        | 5.5                   | 5 | 1.5                                 | 1371                        | 923.8     | 23.2   |
| Repeatability  |                       |   |                                     | 2.5%                        | 1.2%      | 4.3%   |



## HY-80 Test (Strain Rate vs Time)



## HY-80 Test (Strain vs Stress) (Strain Rate 4260/3610/1370)

