

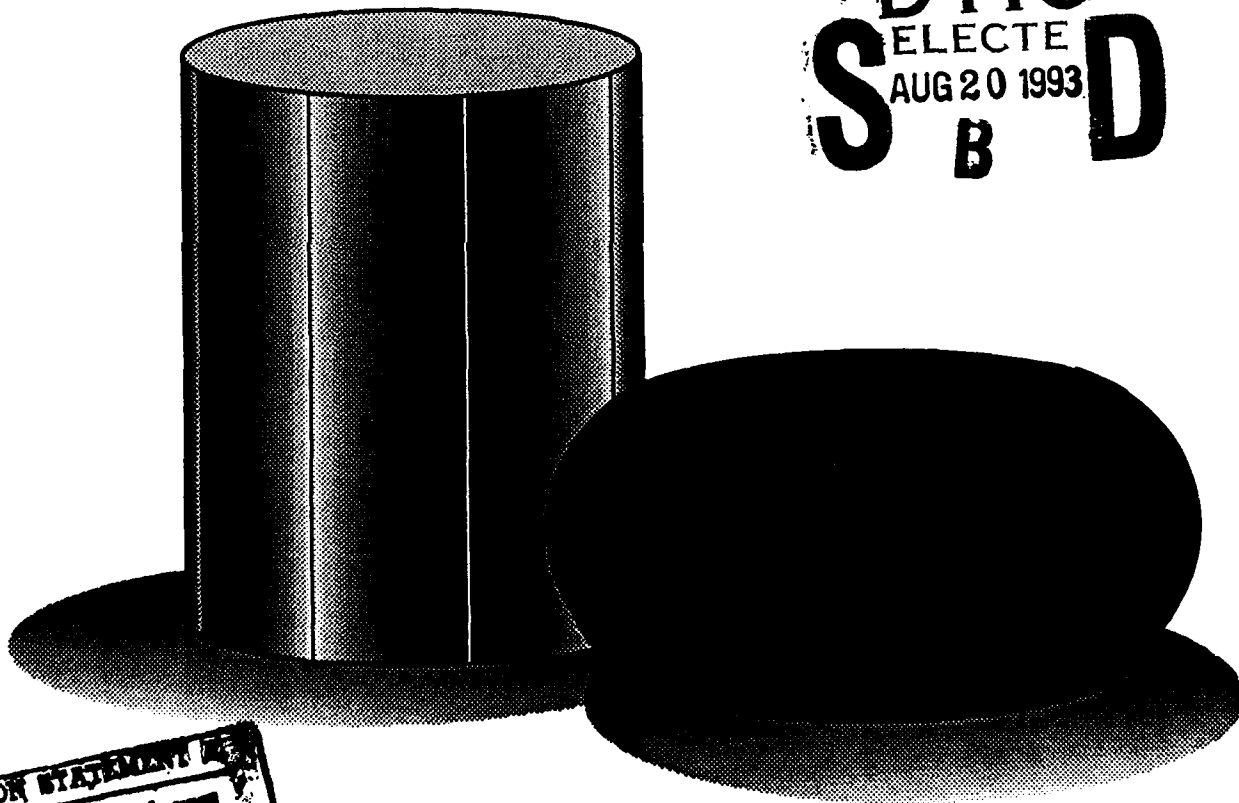
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# Atlas of Formability,

Permalloy - 80  
Flow Stress Curves,



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**ATLAS OF FORMABILITY**

**PERMALLOY - 80**

**by**

**Howard A. Kuhn**

**National Center for Excellence in Metalworking Technology  
1450 Scalp Avenue  
Johnstown, PA 15904**

**for**

**Naval Industrial Resource Support Activity  
Building 75-2, Naval Base  
Philadelphia, PA 19112-5078**

**February 25, 1991**

**The views, opinions, and/or findings contained in this report are those of the authors and should not be construed as an official Department of the Navy position, policy, or decision, unless so designated by other documentation**

# REPORT DOCUMENTATION PAGE

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |                                                            |                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------|
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| 13. ABSTRACT (Maximum 200 words)<br><br>In this investigation, flow behavior of Permalloy - 80 alloy was studied by conducting compression tests over a wide range of temperatures (1112 - 2192 F) at high strain rates ( $1 - 10 \text{ s}^{-1}$ ). The true stress-true strain flow curves are presented for each test condition. This report supplies ample mechanical property data on Permalloy - 80 alloy for mechanical and materials engineers in the field of metalworking process design. The data presented here are also very helpful in finite element analysis of metalworking processes. |                                                             |                                                            |                                                                          |
| 14. SUBJECT TERMS<br>Permalloy - 80, Deformation Processing, High Temperature Deformation, Processing Map, Metalworking, Microstructure                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                             |                                                            | 15. NUMBER OF PAGES<br>22                                                |
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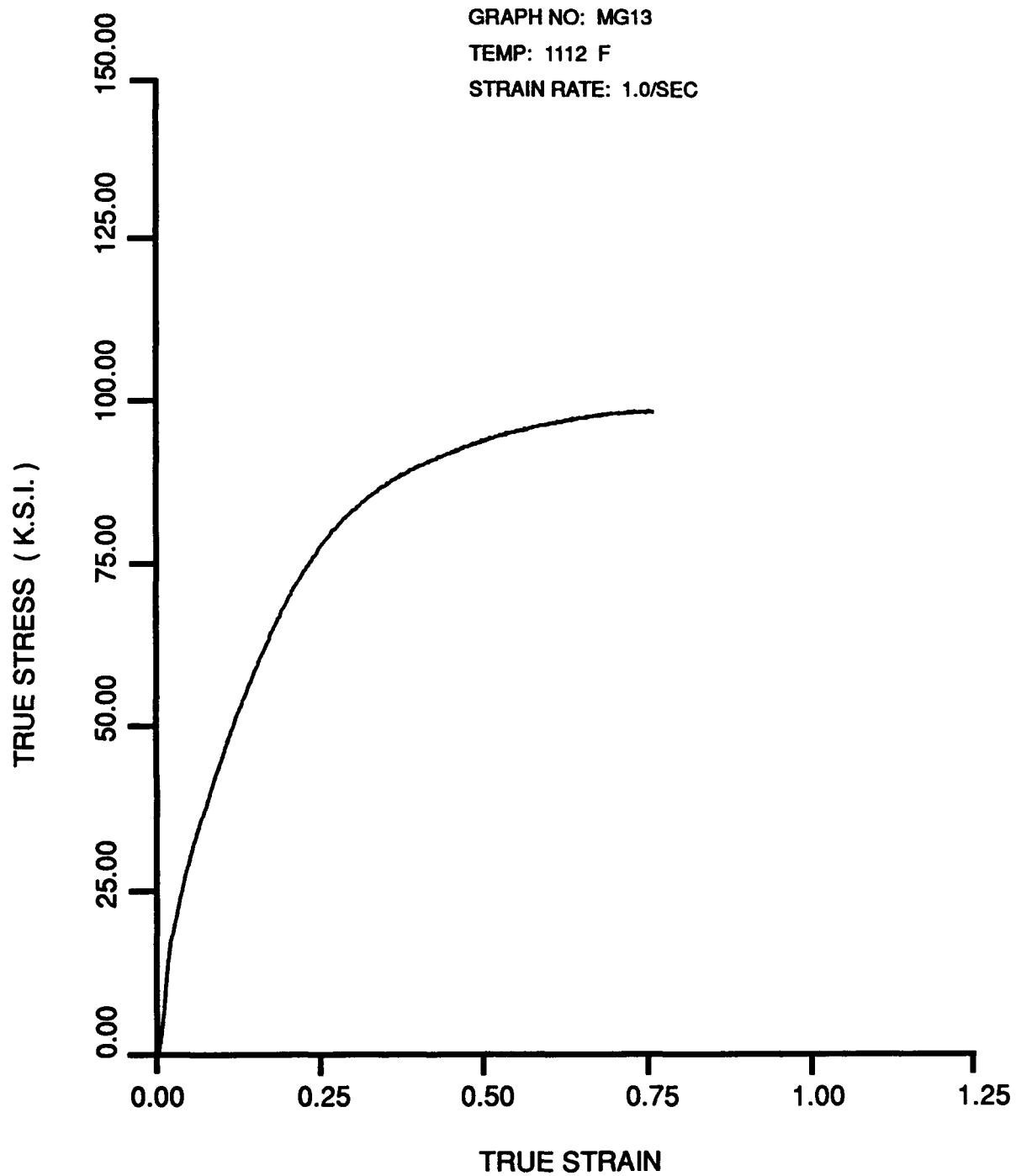
## Permalloy - 80

### Composition:

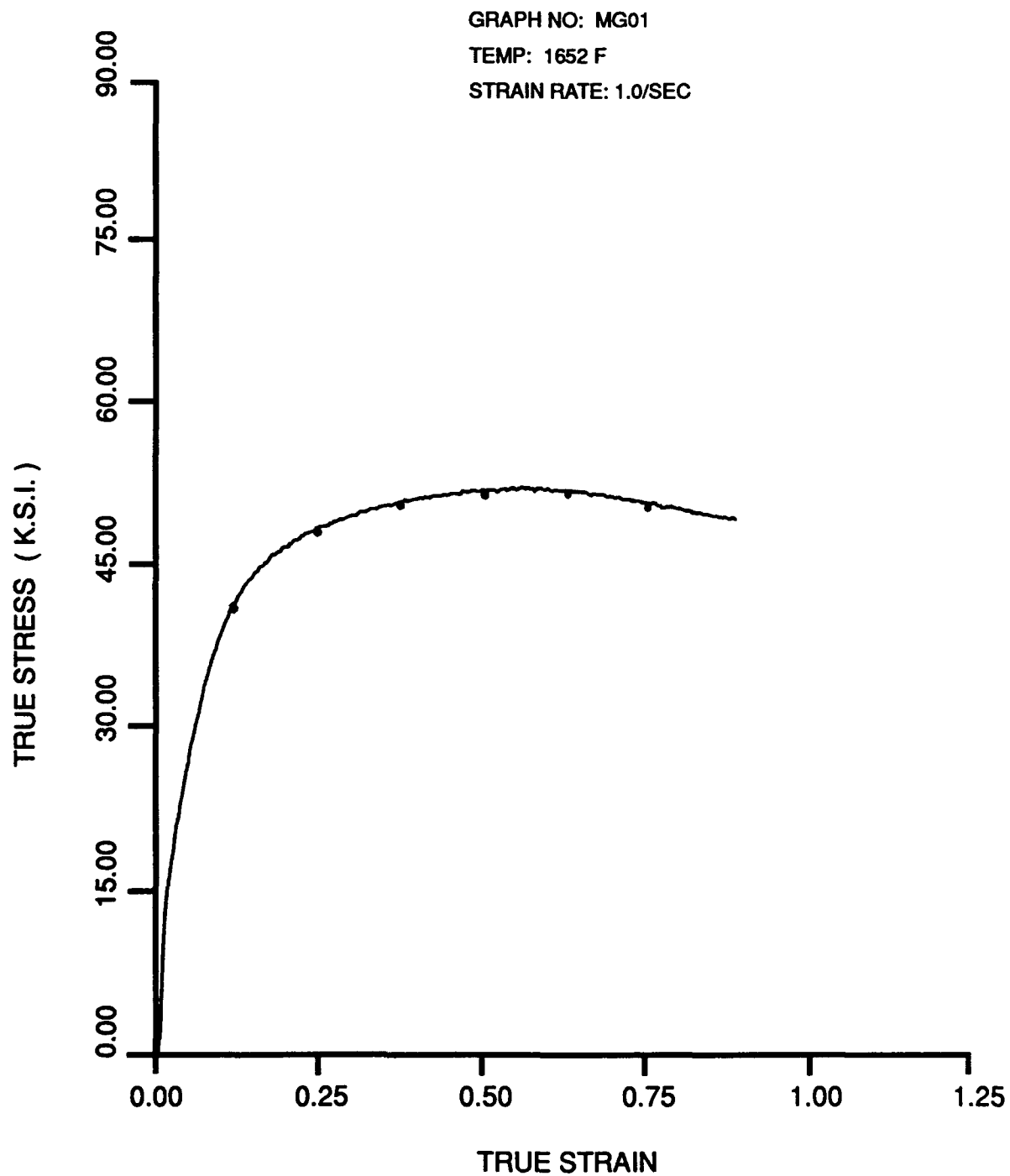
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|------|------|-----|-----|-----|
| Ni   | Fe   | Mo  | Mn  | Si  |
| 80.2 | 14.6 | 4.4 | 0.5 | 0.3 |

### Testing Parameters

| Strain Rate (1/sec.) | Temperature (deg. F) | Graph Number | Page Number |
|----------------------|----------------------|--------------|-------------|
| 1.0                  | 1112                 | MG13         | 2           |
| 1.0                  | 1652                 | MG01         | 3           |
| 1.0                  | 2192                 | MG26         | 4           |
| 2.3                  | 1270                 | MG14         | 5           |
| 2.3                  | 1652                 | MG02         | 6           |
| 2.3                  | 2034                 | MG18         | 7           |
| 2.4                  | 1270                 | MG15         | 8           |
| 2.4                  | 2034                 | MG20         | 9           |
| 5.0                  | 1652                 | MG03         | 10          |
| 5.5                  | 1112                 | MG09         | 11          |
| 5.5                  | 1652                 | MG30         | 12          |
| 5.5                  | 2192                 | MG25         | 13          |
| 8.6                  | 1270                 | MG16         | 14          |
| 8.6                  | 2034                 | MG17         | 15          |
| 10.0                 | 1112                 | MG22         | 16          |
| 10.0                 | 1652                 | MG10         | 17          |
| 10.0                 | 2192                 | MG23         | 18          |



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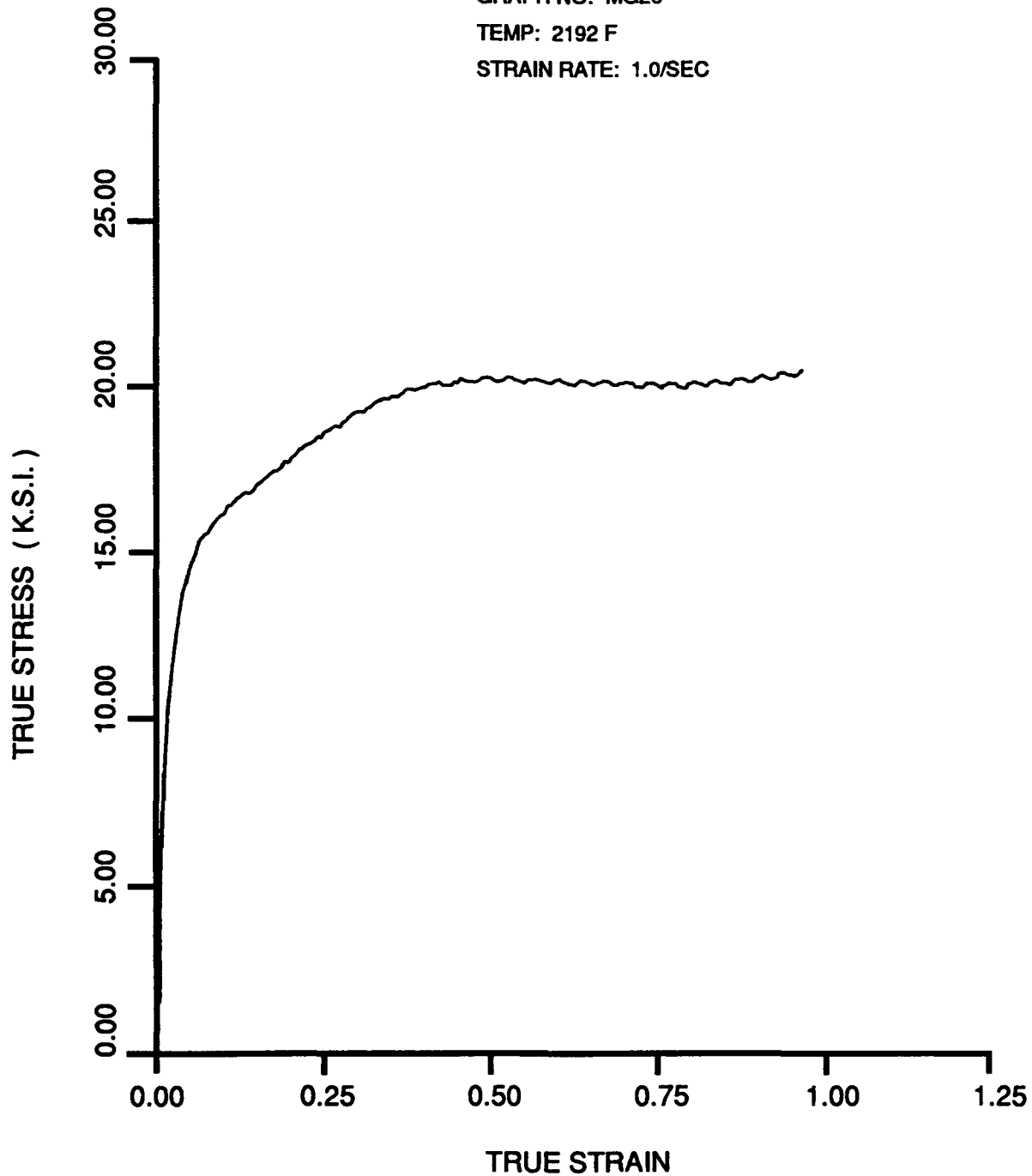


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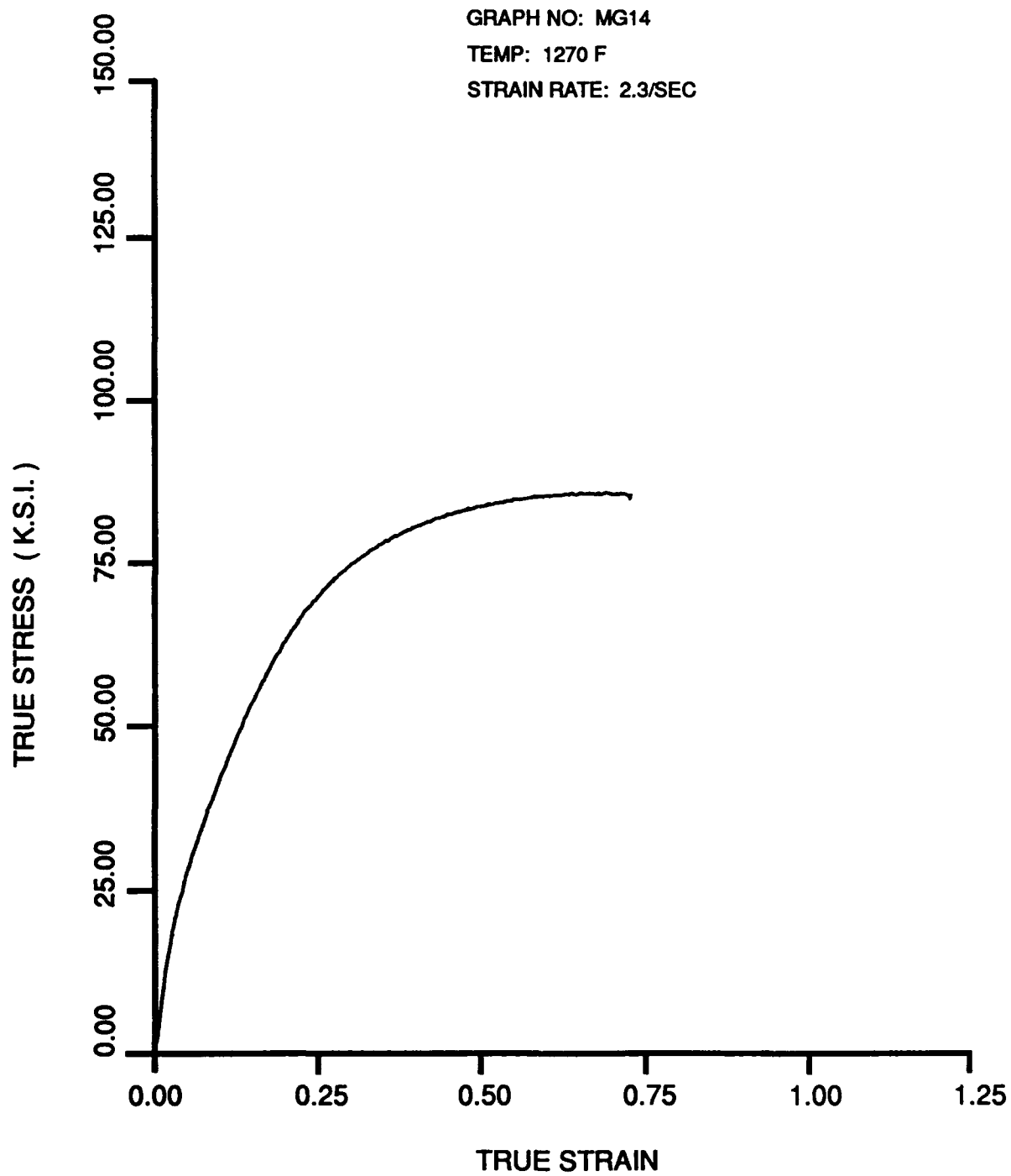
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TEMP: 2192 F

STRAIN RATE: 1.0/SEC



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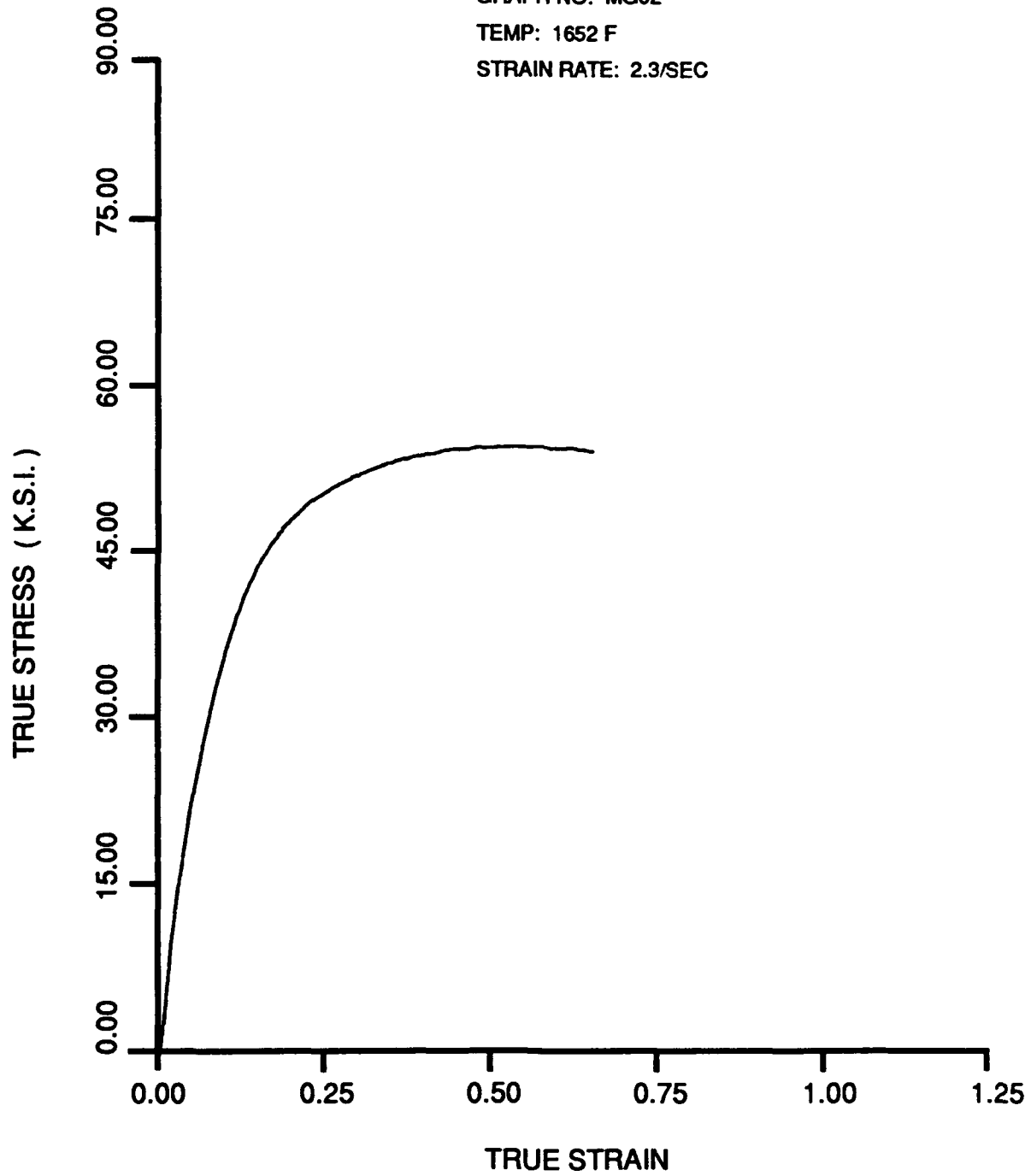


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GRAPH NO: MG02

TEMP: 1652 F

STRAIN RATE: 2.3/SEC

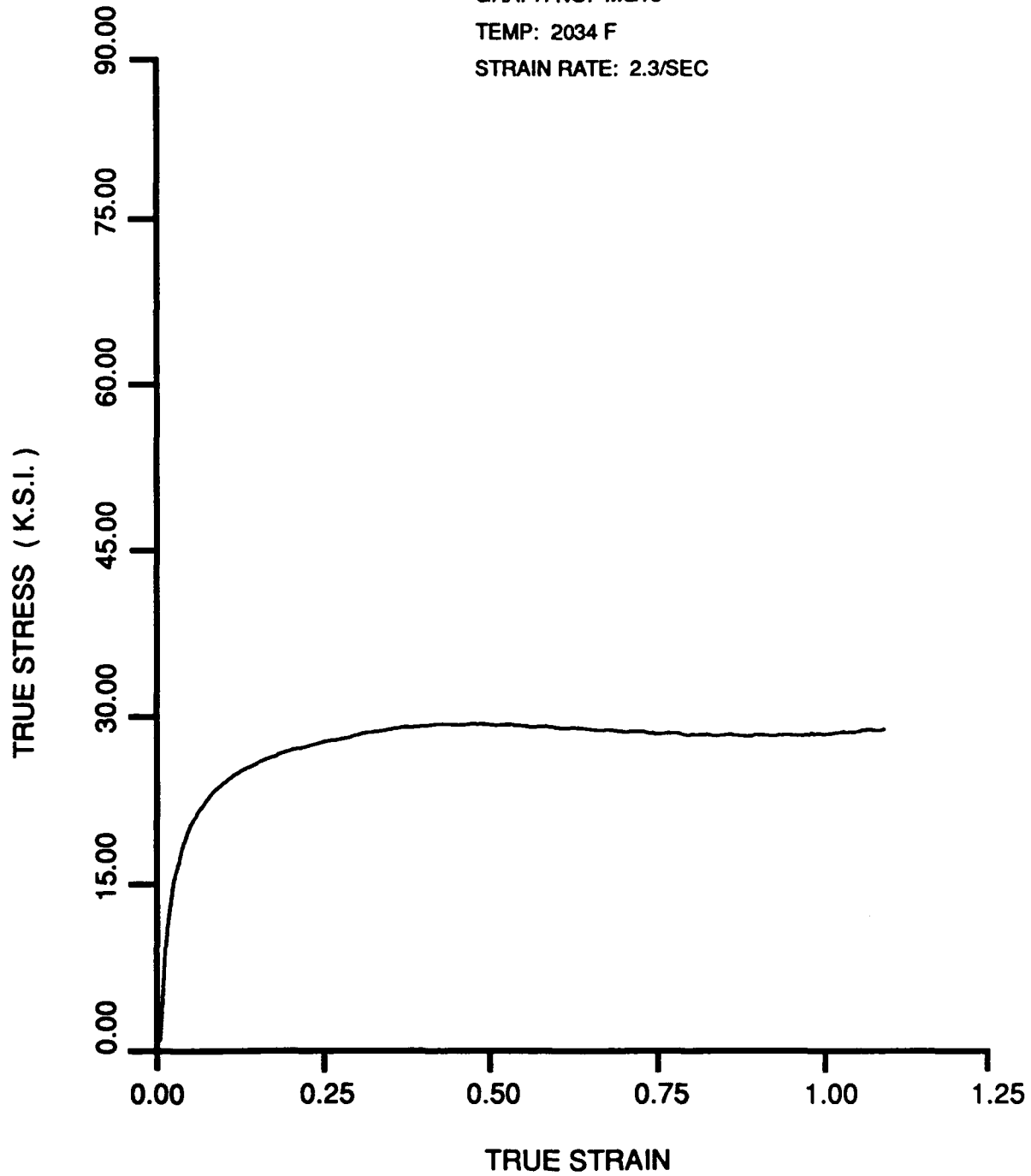


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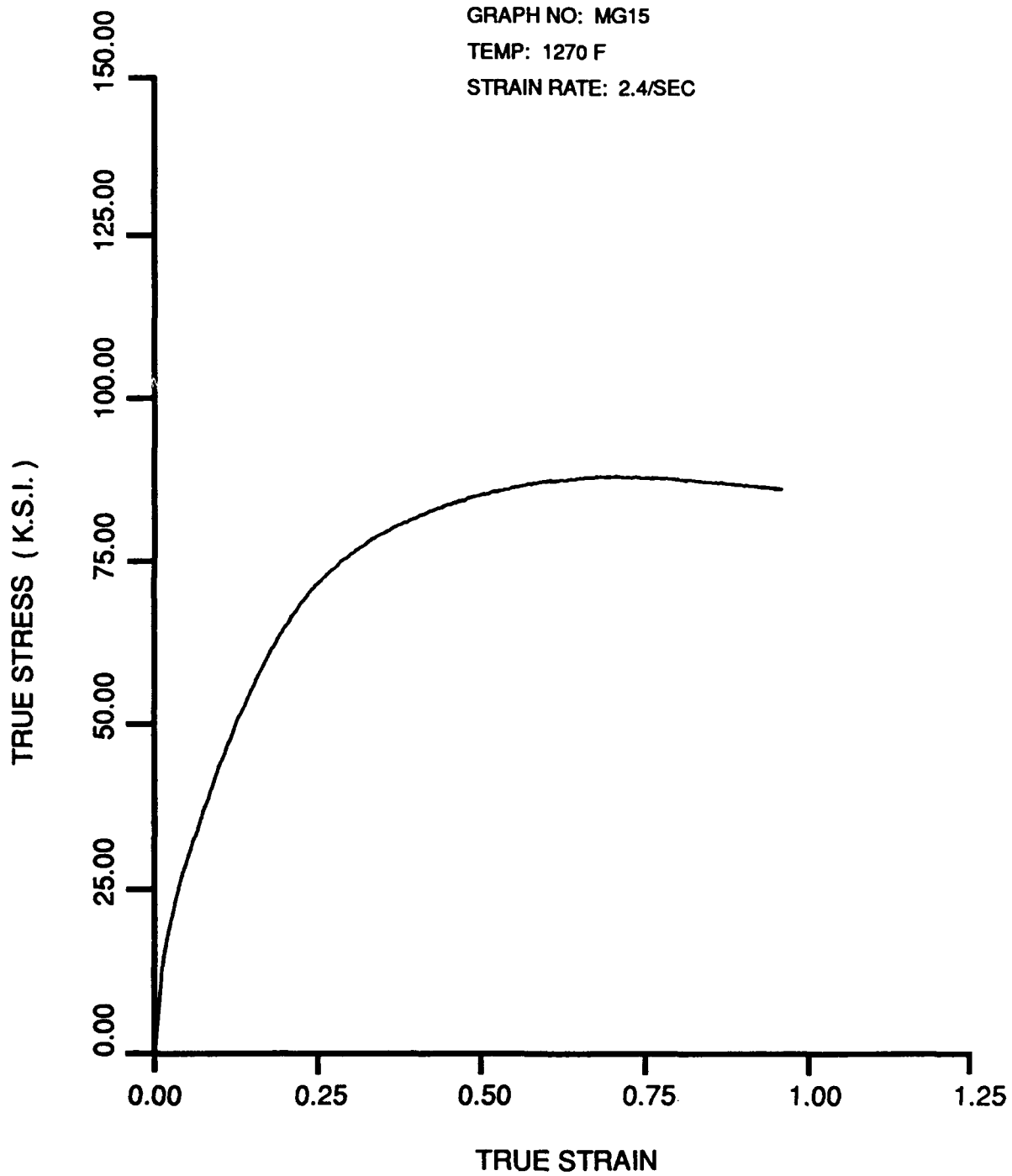
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STRAIN RATE: 2.3/SEC



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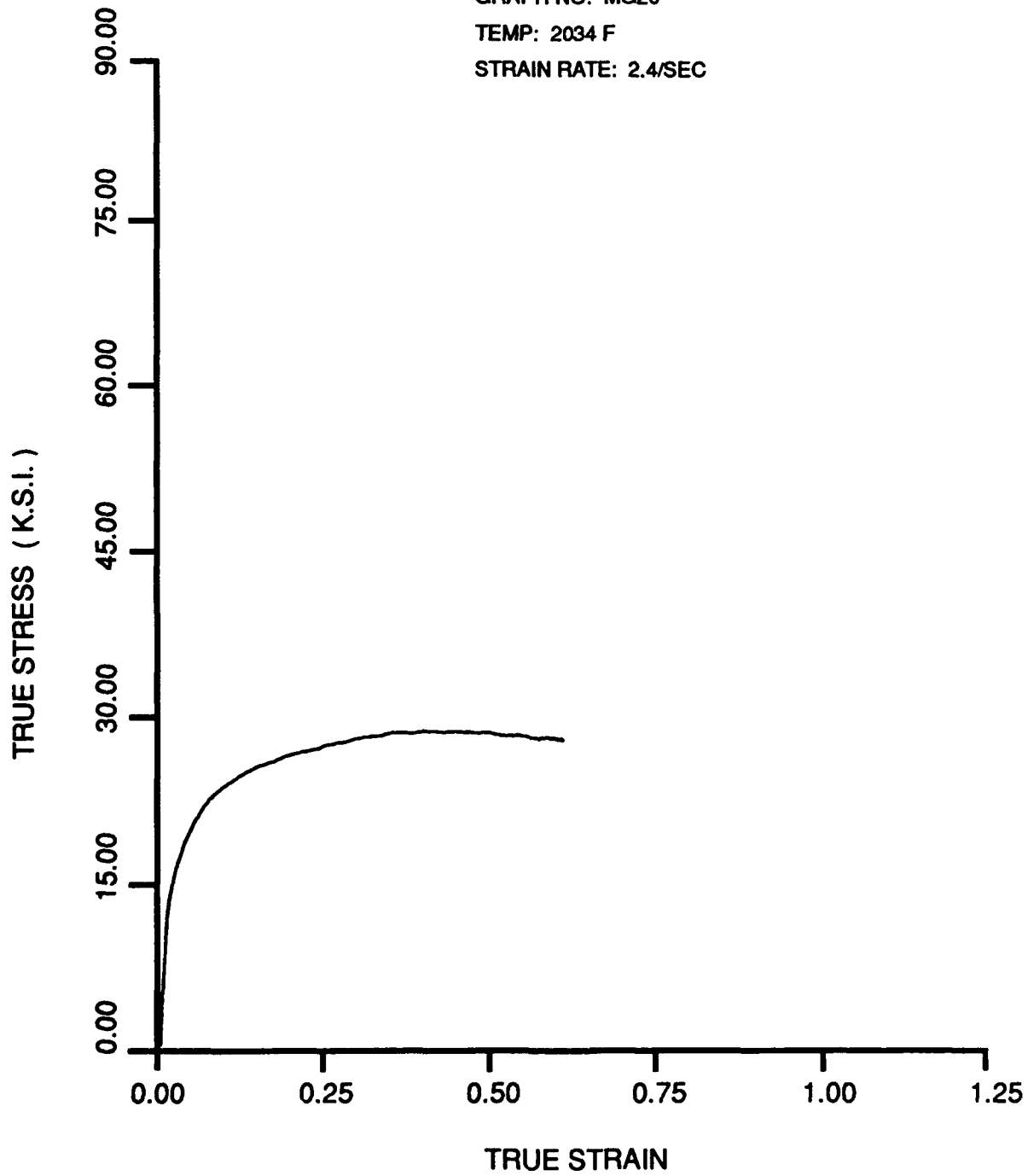


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TEMP: 2034 F

STRAIN RATE: 2.4/SEC

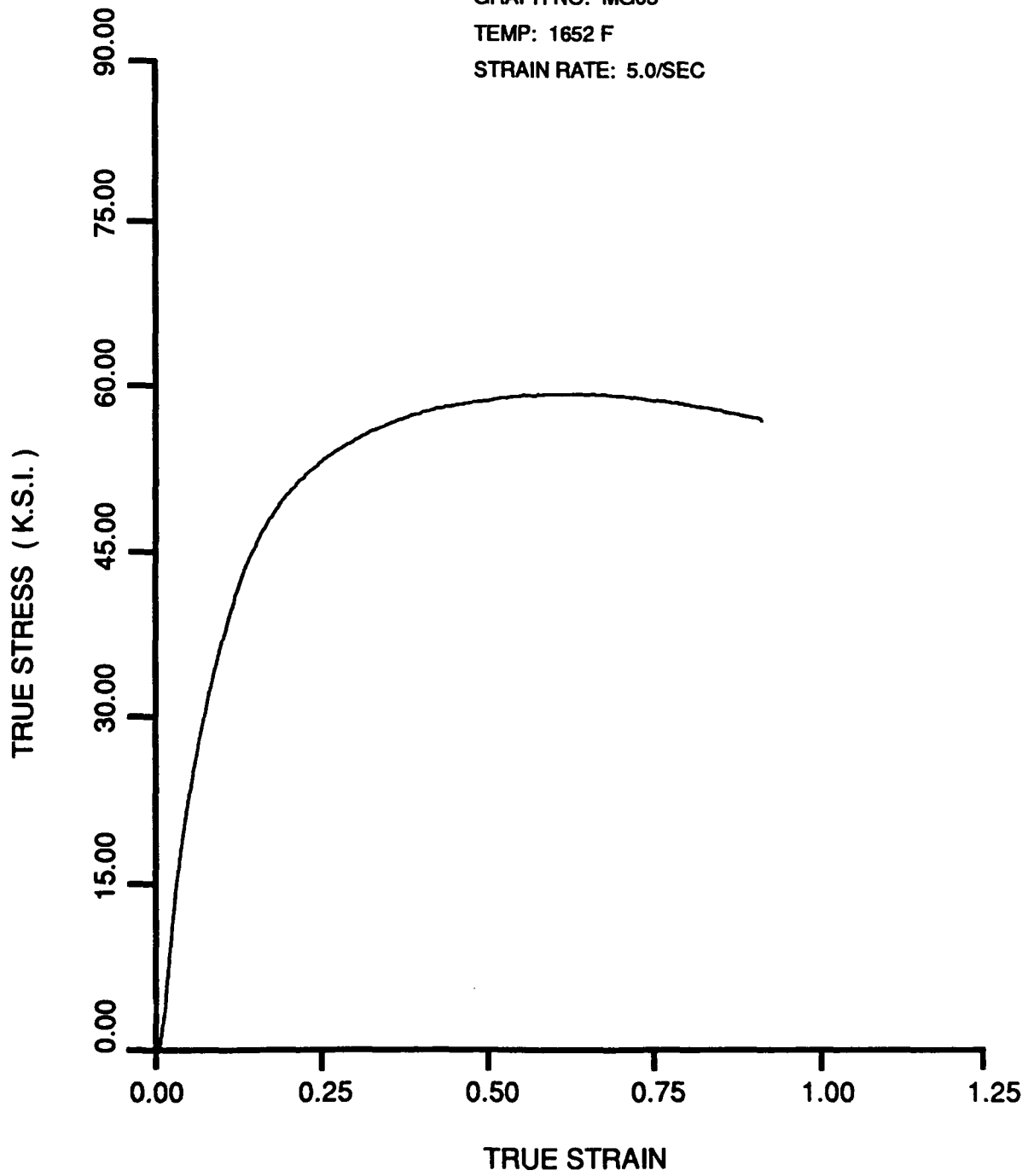


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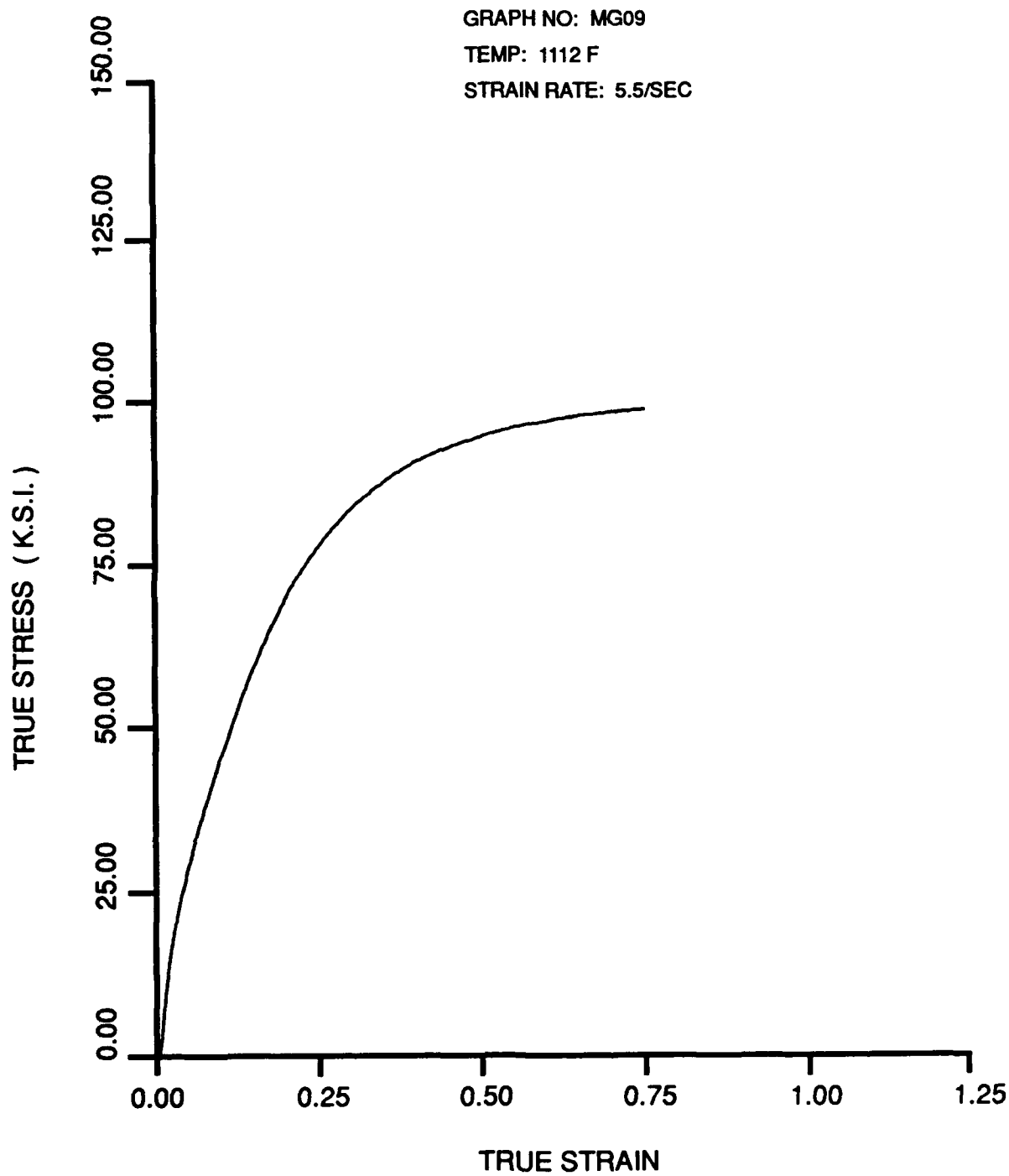
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STRAIN RATE: 5.0/SEC



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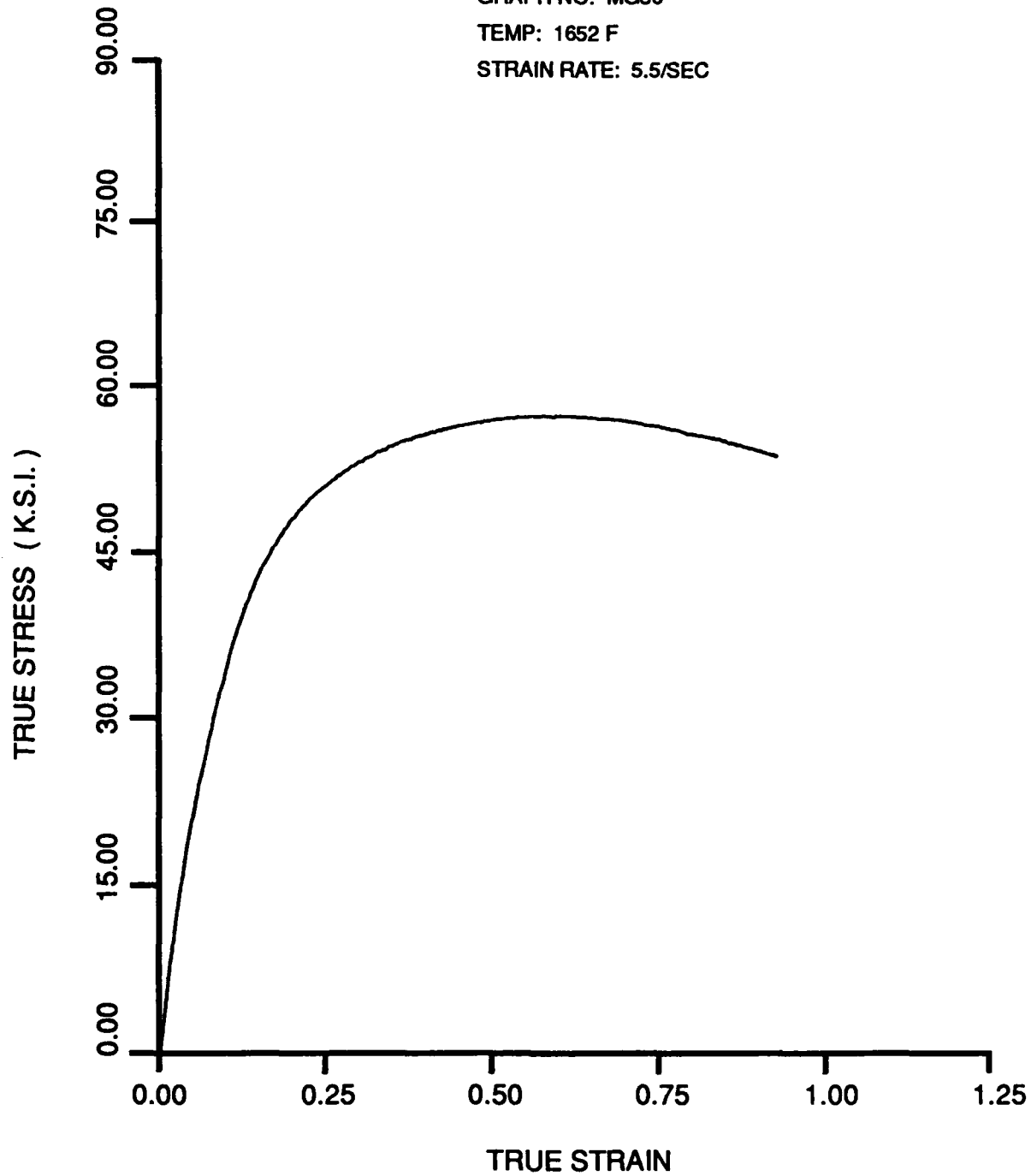


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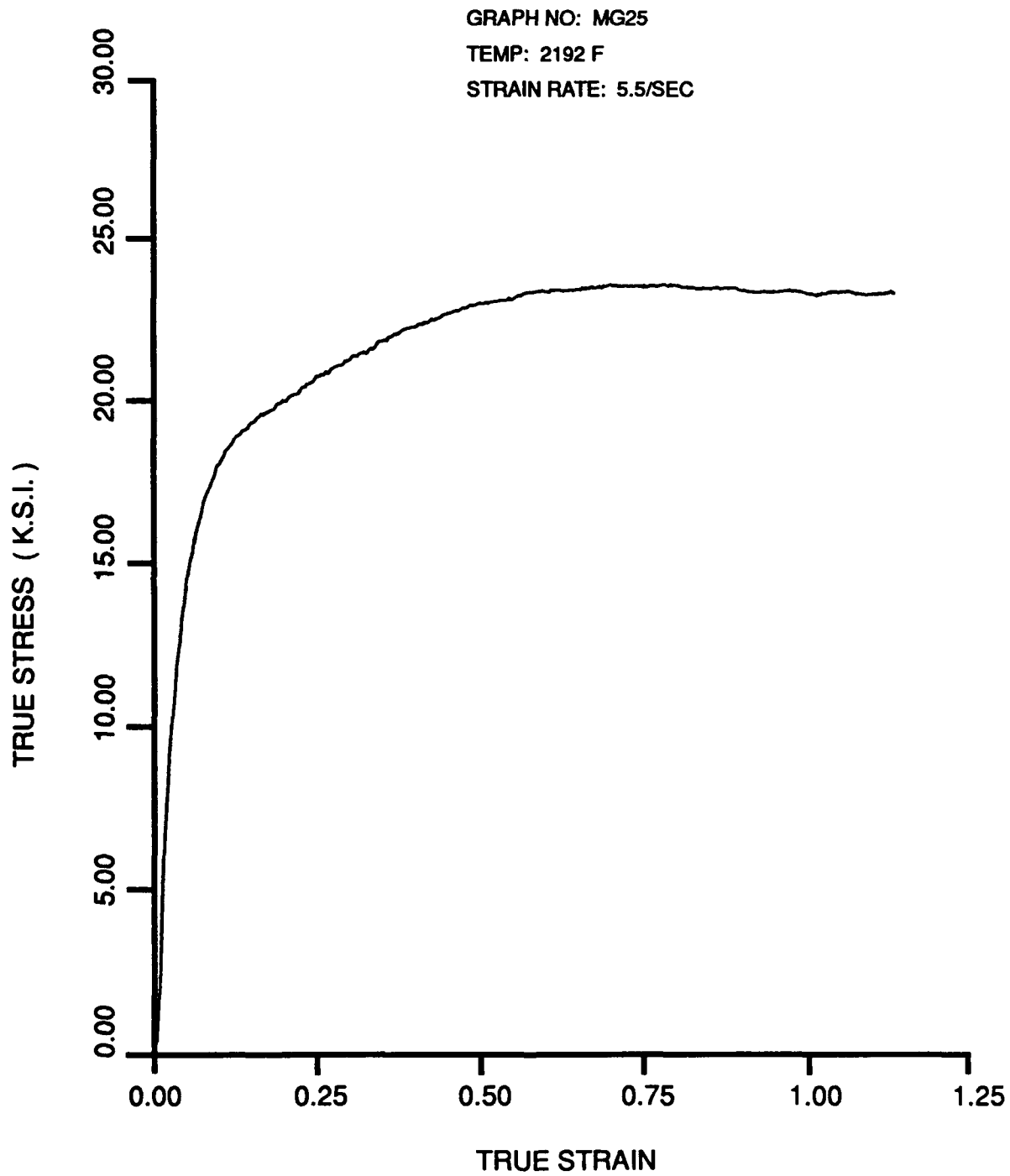
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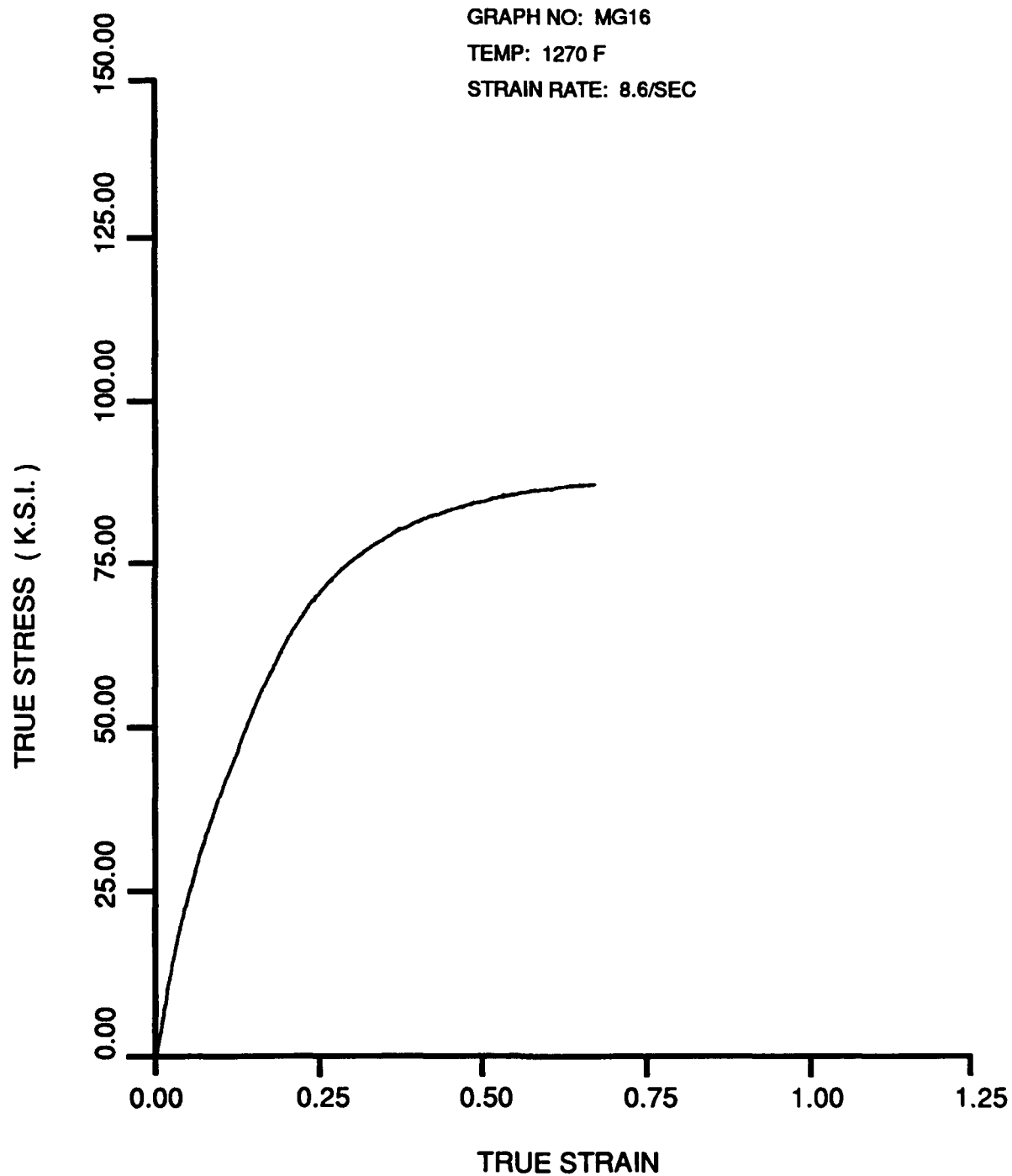
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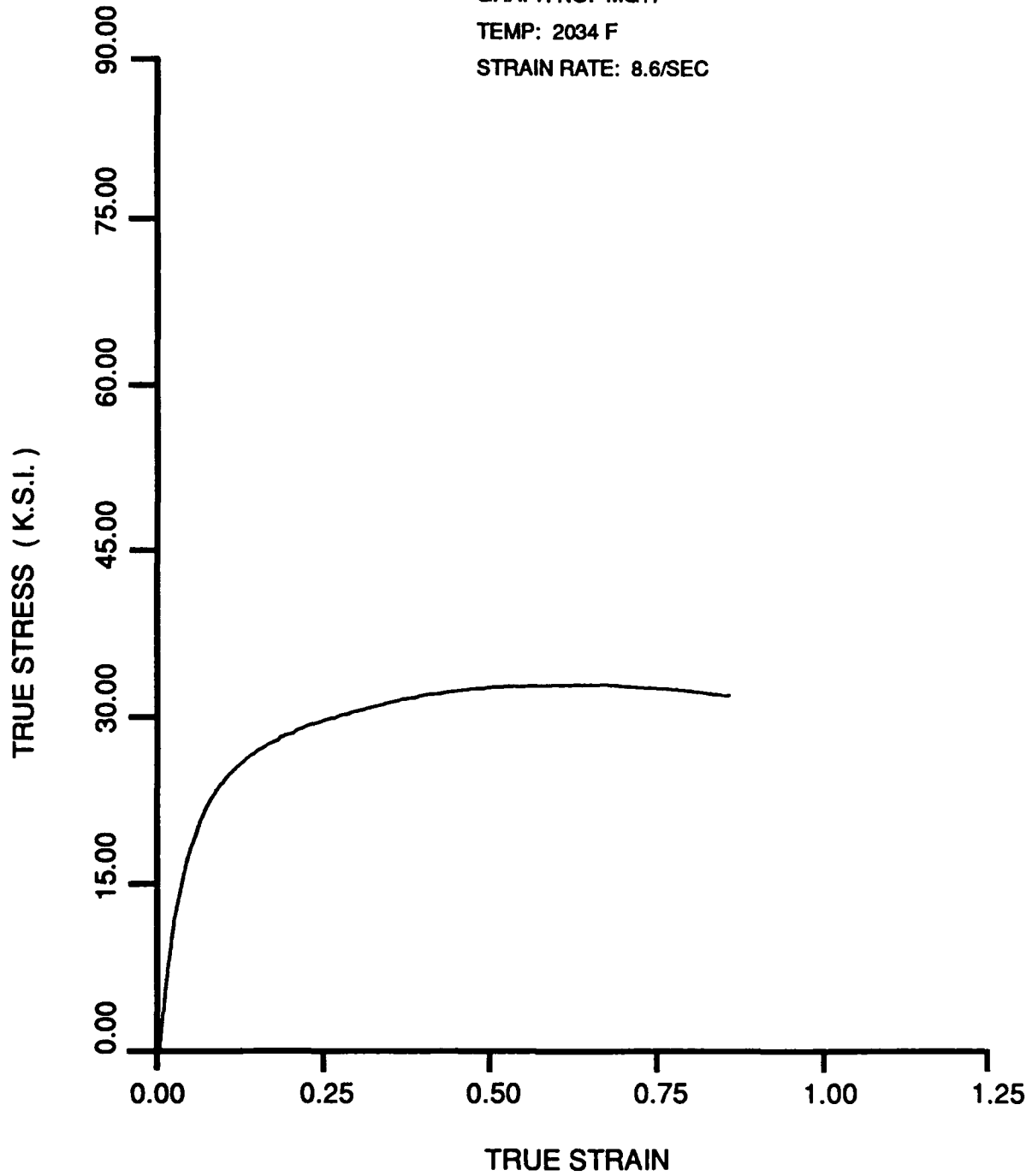


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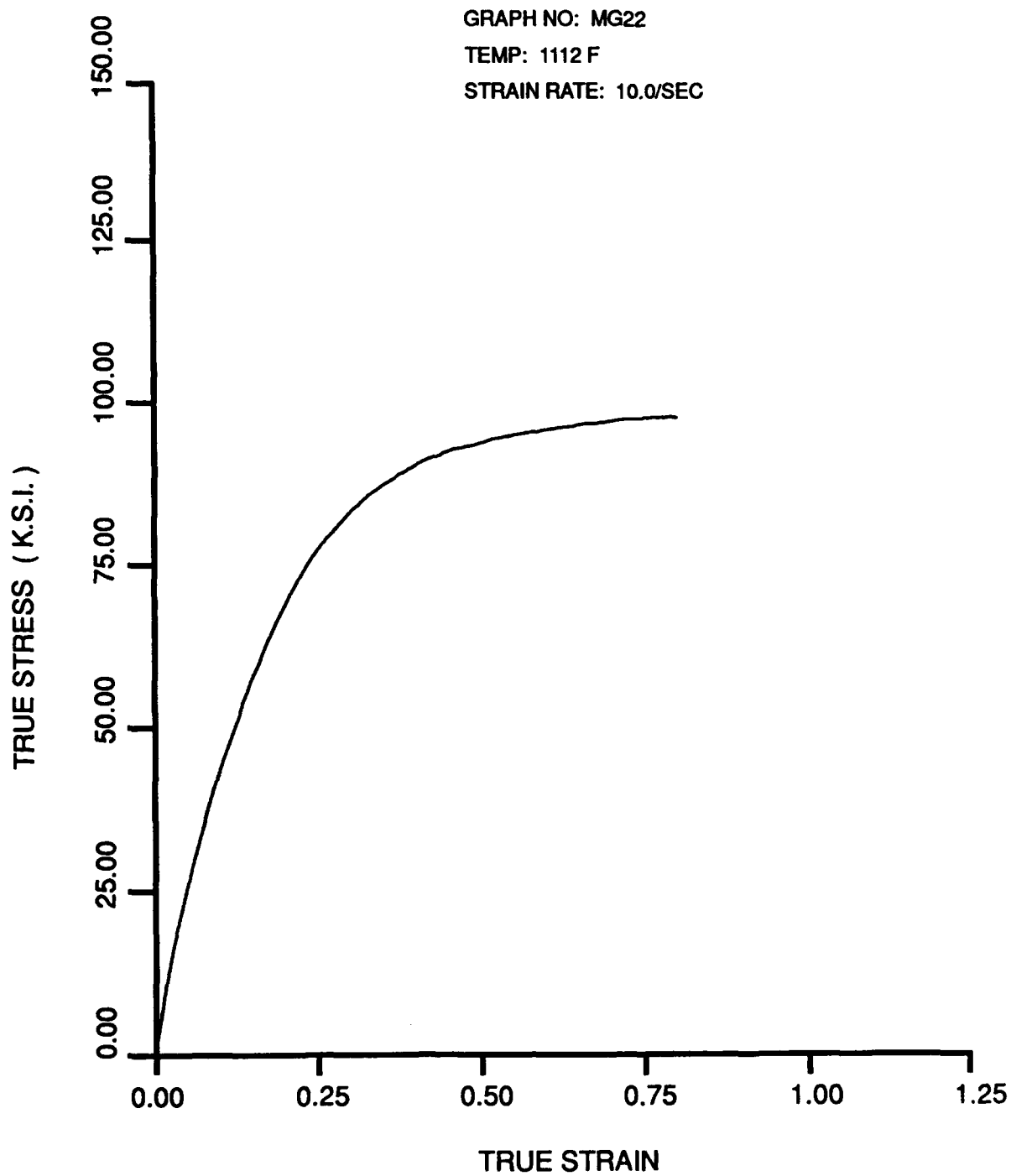
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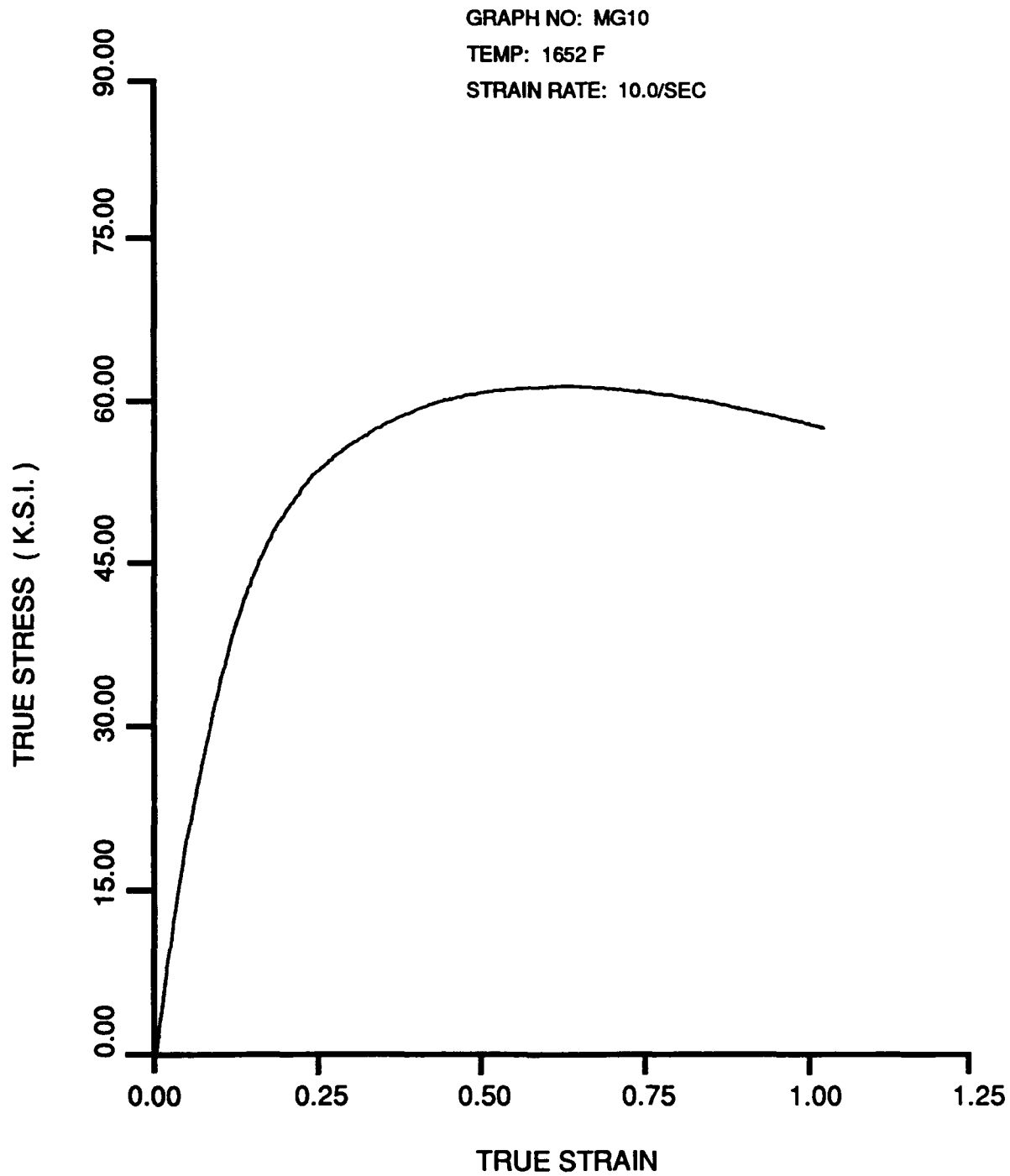
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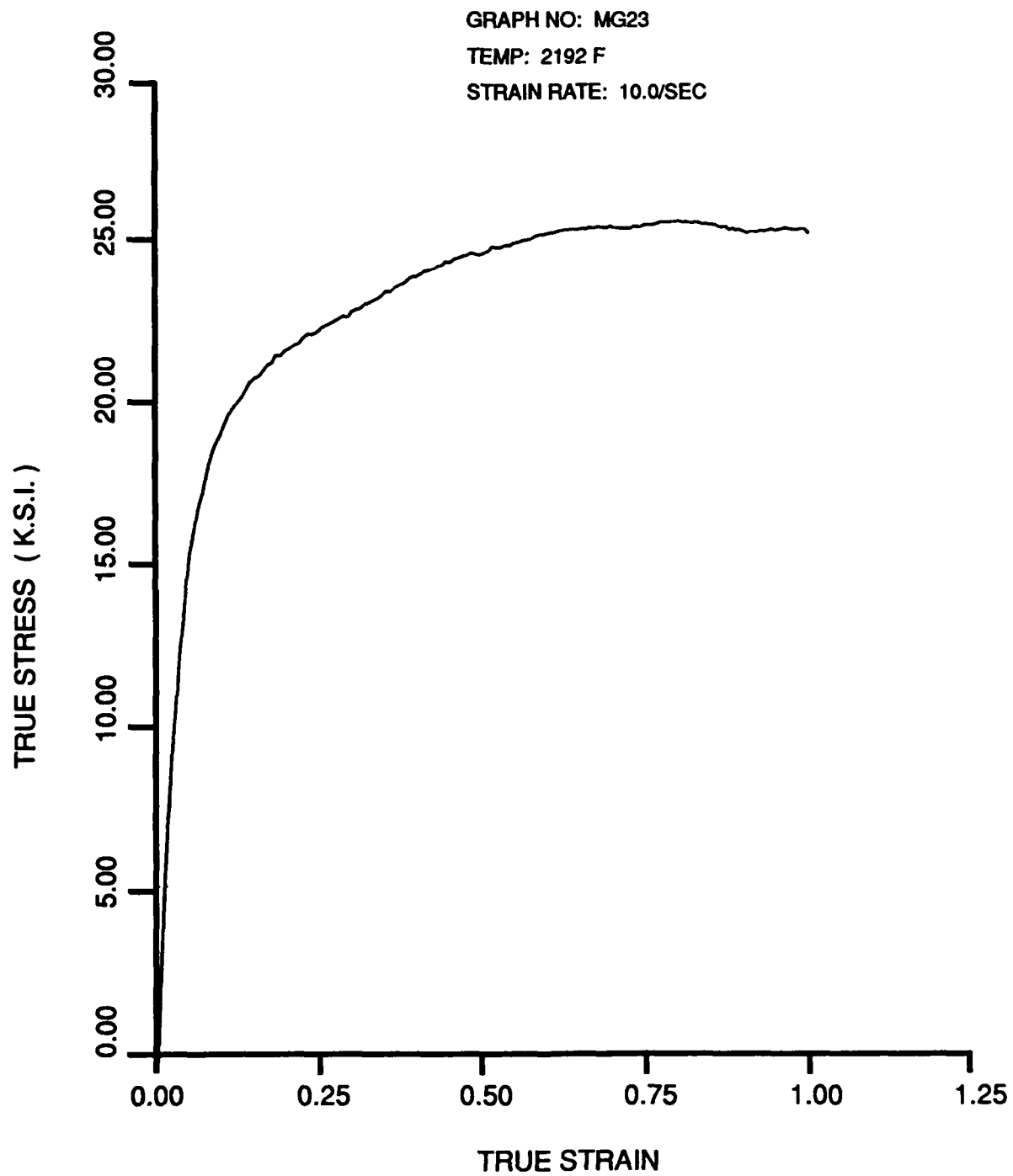
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