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MET Lab Report 24148



# METLAB.

Report 24148



May — 20 — 24



# PLS Met Lab Report 24148 Laser Welding

## Overview

Title Slide

### Objective

- Compare the results of the weld quality of each sample that were laser welded and tig welded

### Material

Base Material

- P20

Filler Metal

- P20

### Reference Documents

- None

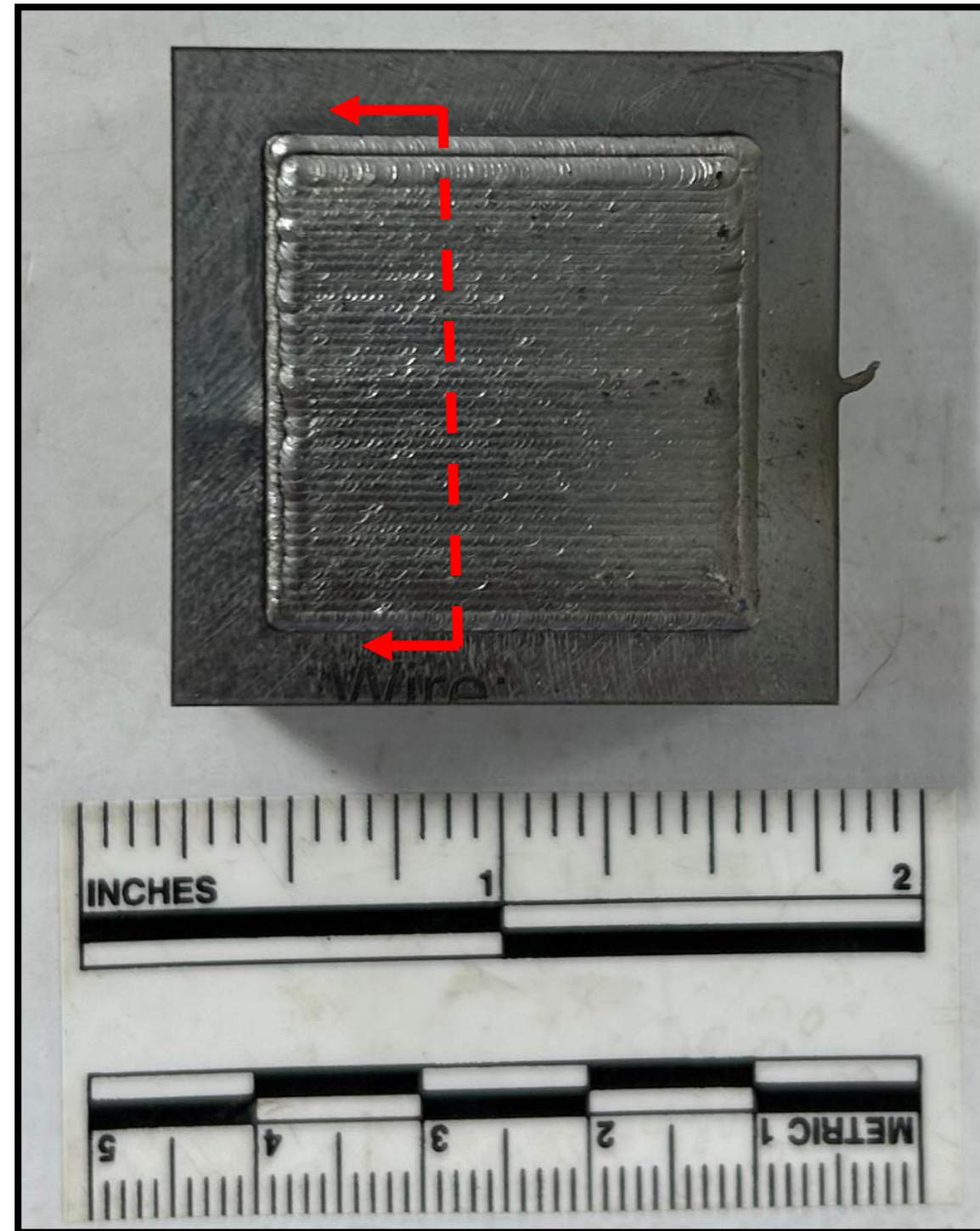
### Sample ID Notes

[D854 - Laser](#)

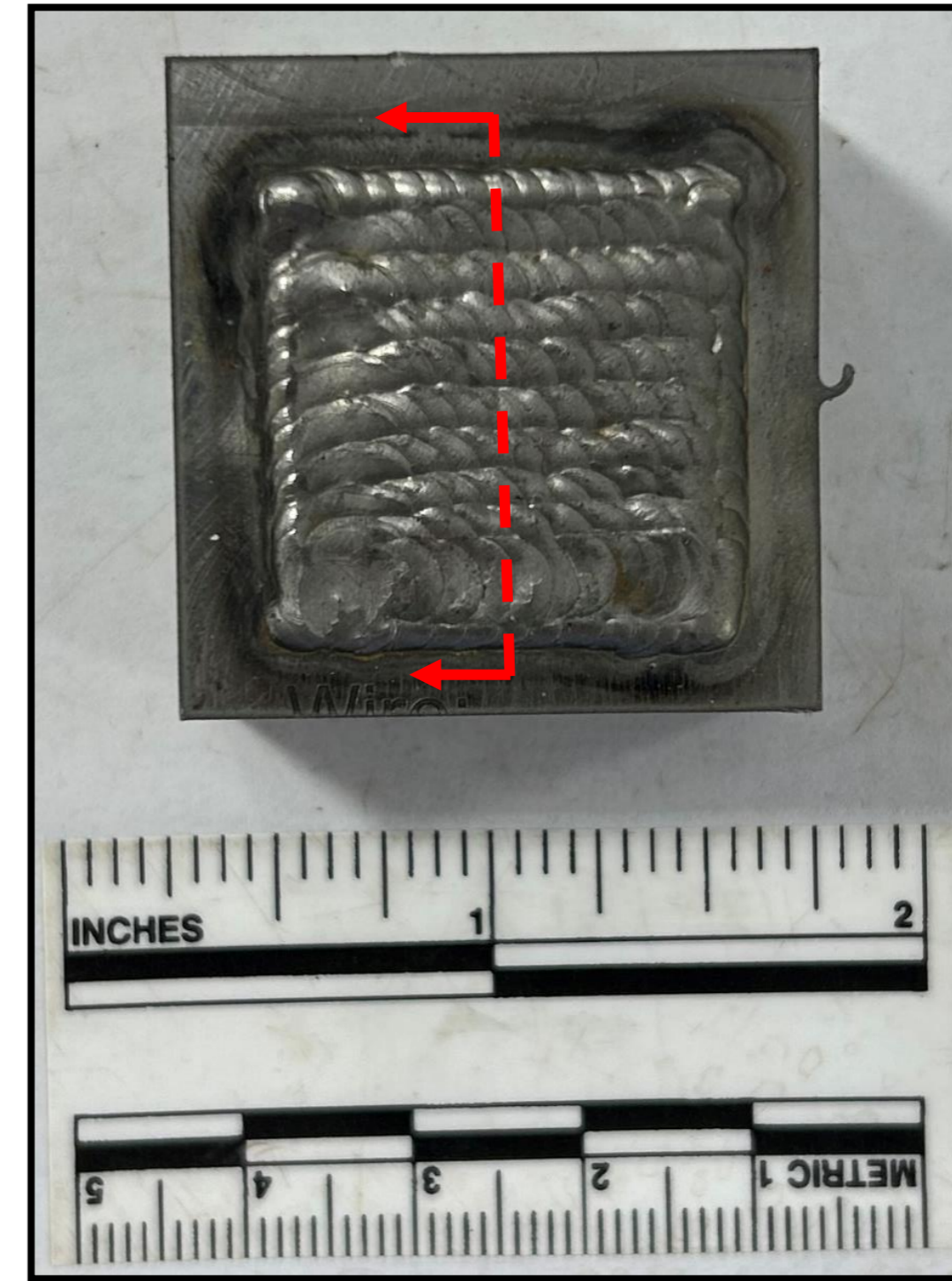
[D854 Core Hardness](#)

[D855 - Tig](#)

[D855 Core Hardness](#)



D854 - Laser



D855 - Tig

LASER WELDING & Tig



# PLS Met Lab Report 24148

## Overview D854

Title Slide

Laser Welding  
WO#26236-00

### Material

Base Material

- P20

Filler Metal

- P20

### Reference Documents

- None

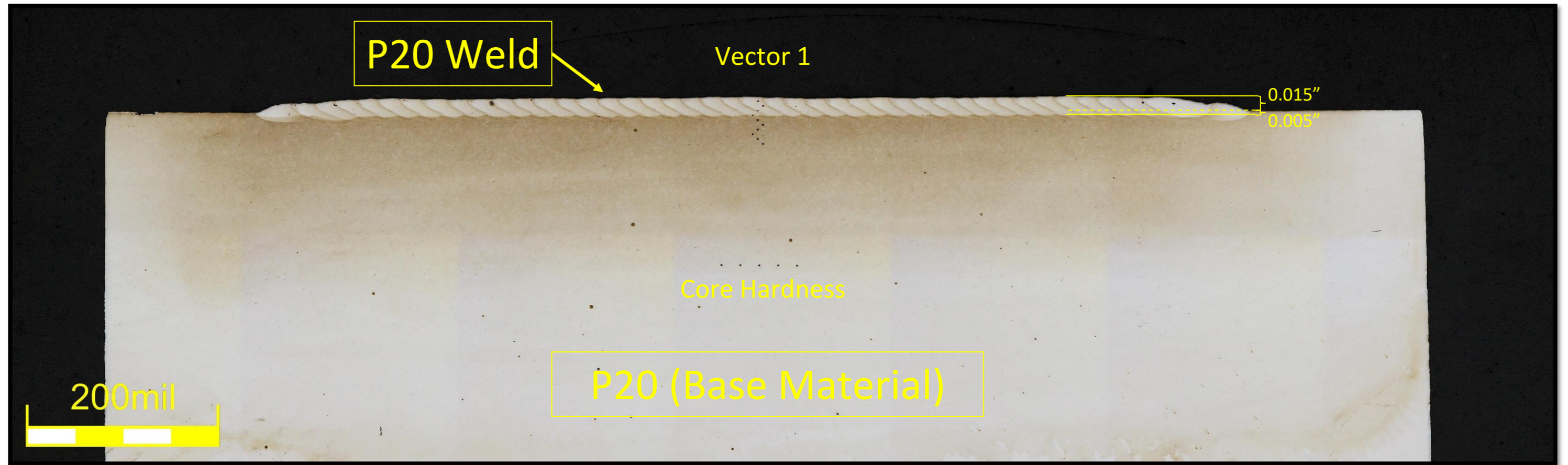
### Sample ID Notes

D854 - Laser

D854 Core Hardness

D855 - Tig

D855 Core Hardness



**Notes**  
Build up: 0.015"  
Penetration: 0.005"

LASER WELDING & Tig



# PLS Met Lab Report 24148

## D854 (Vector 1)

Title Slide

Laser Welding  
 WO#26236-00

Name	Description	Comment	Analysis Date
D854	P20 on P20 Laser Weld	500 gf at 8 sec dwell time	5/17/2024 10:53:19 AM

Indent #	Location	Distance	Hardness	HRC
1		0.005 in	414 HV	42 HRC
2		0.010 in	393 HV	40 HRC
3		0.015 in	473 HV	47 HRC
4		0.020 in	512 HV	50 HRC
5		0.025 in	305 HV	30 HRC
6		0.030 in	315 HV	32 HRC
7		0.036 in	307 HV	31 HRC
8		0.041 in	299 HV	30 HRC
9		0.045 in	304 HV	30 HRC
10		0.051 in	307 HV	31 HRC

Maximum	Minimum	Average
512 HV	299 HV	363 HV

### Material

Base Material

- P20

Filler Metal

- P20

### Reference Documents

- None

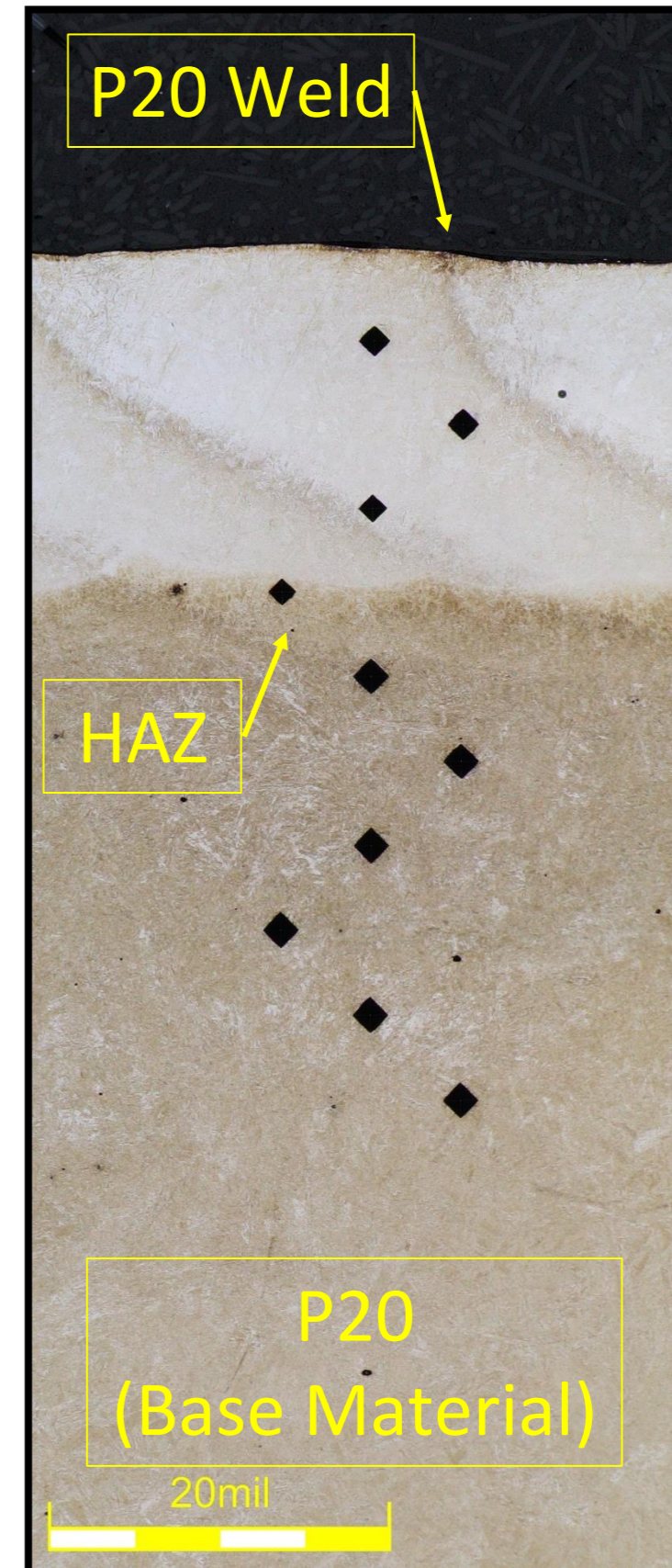
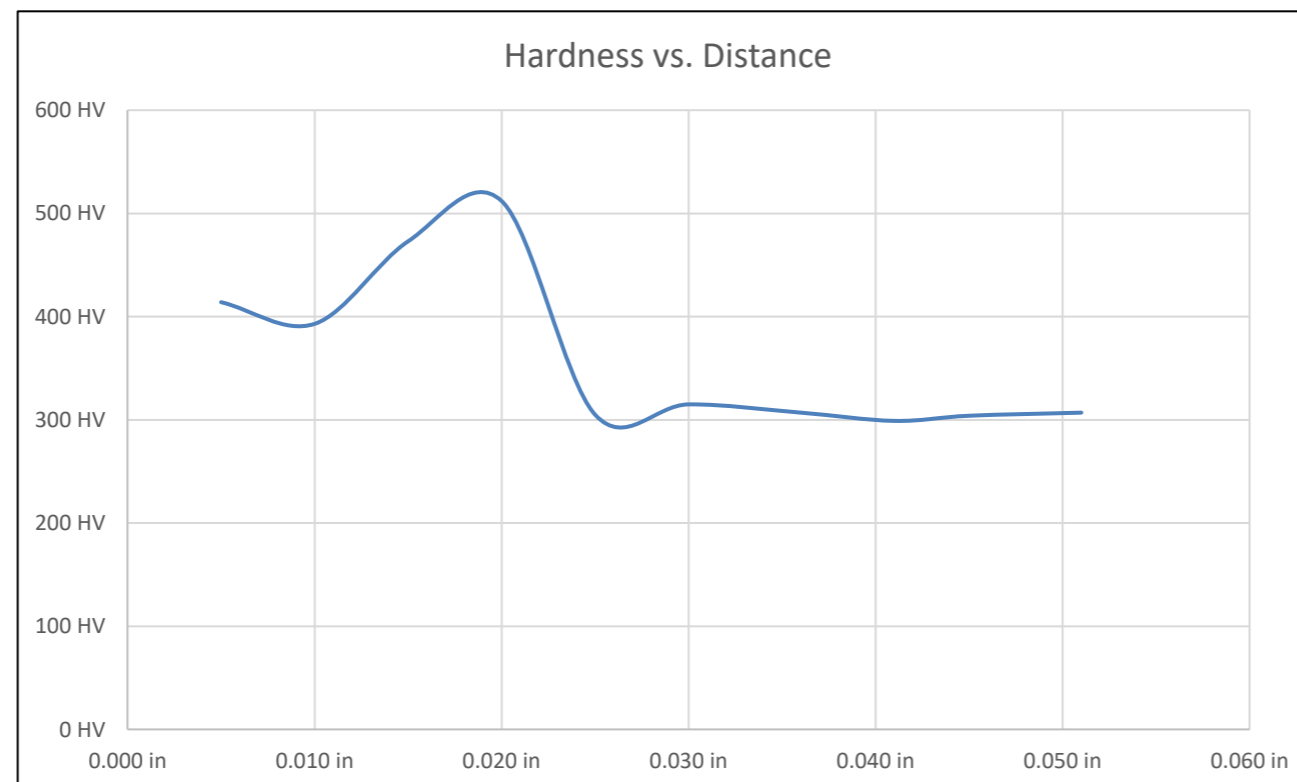
### Sample ID Notes

[D854 - Laser](#)

[D854 Core Hardness](#)

[D855 - Tig](#)

[D855 Core Hardness](#)



LASER WELDING & Tig



# PLS Met Lab Report 24148

## D854 (Core Hardness)

Title Slide

Laser Welding  
 WO#26236-00

Name	Description	Comment	Analysis Date
D854	P20 on P20 Laser Weld	500 gf at 8 sec dwell time	5/17/2024 10:53:19 AM

Indent #	Location	Distance	Hardness	HRC
1		0.020 in	309 HV	31 HRC
2		0.040 in	319 HV	32 HRC
3		0.060 in	315 HV	32 HRC
4		0.080 in	309 HV	31 HRC
5		0.100 in	308 HV	31 HRC

Maximum	Minimum	Average
319 HV	308 HV	312 HV

### Material

Base Material

- P20

Filler Metal

- P20

### Reference Documents

- None

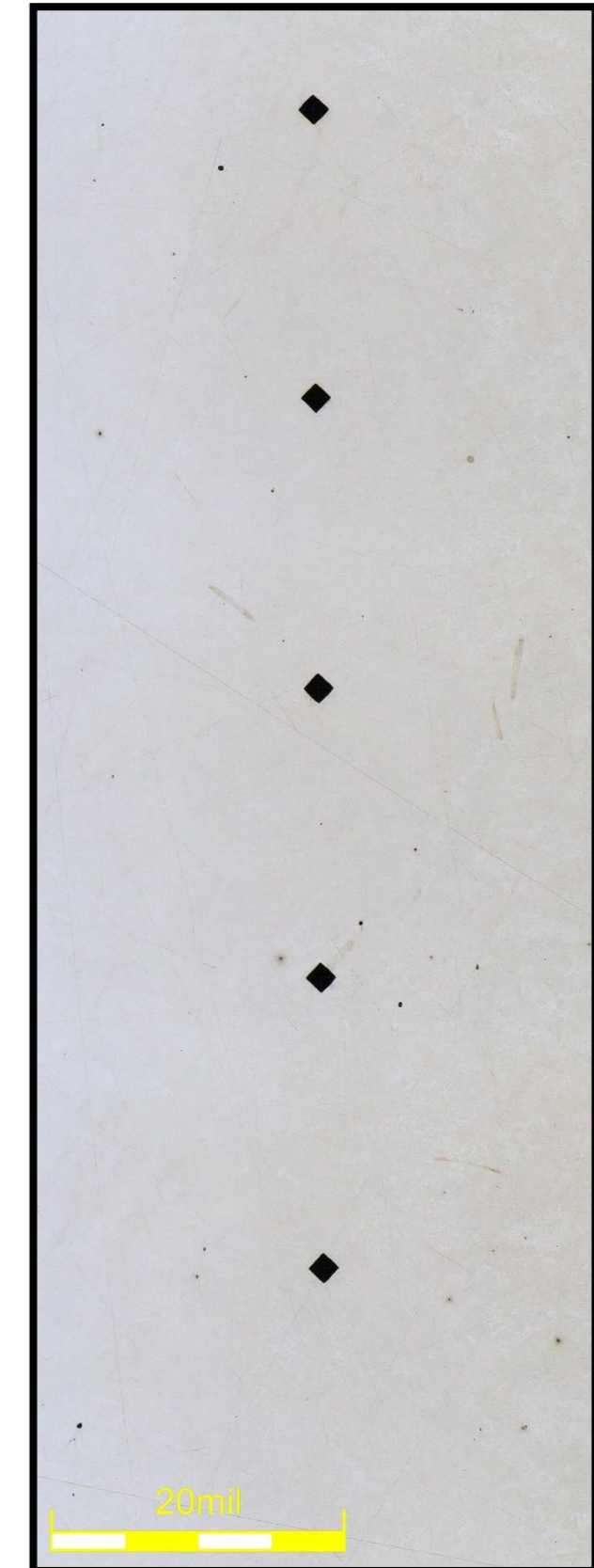
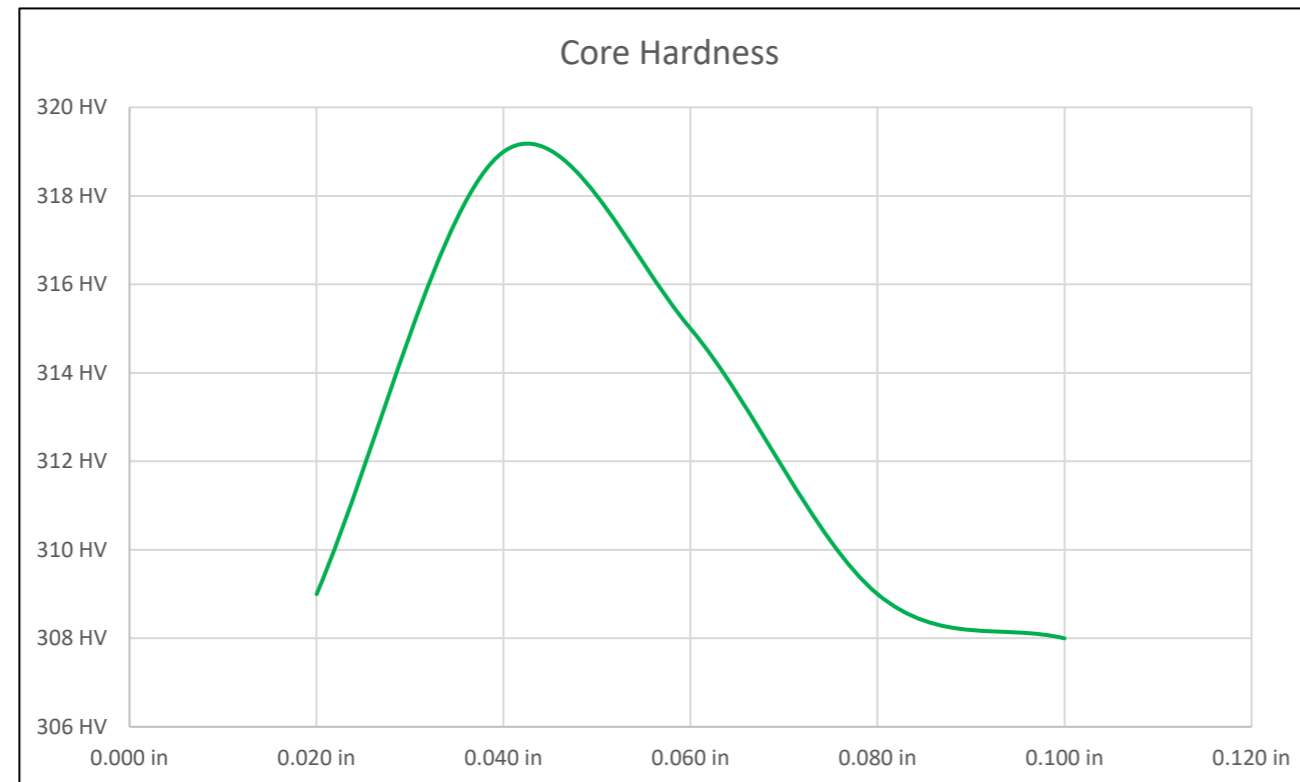
### Sample ID Notes

[D854 - Laser](#)

[D854 Core Hardness](#)

[D855 - Tig](#)

[D855 Core Hardness](#)



Etched with Nital 2%

LASER WELDING & Tig



# PLS Met Lab Report 24148

## Overview D855

Title Slide

Laser Welding  
WO#26236-00

### Material

Base Material

- P20

Filler Metal

- P20

### Reference Documents

- None

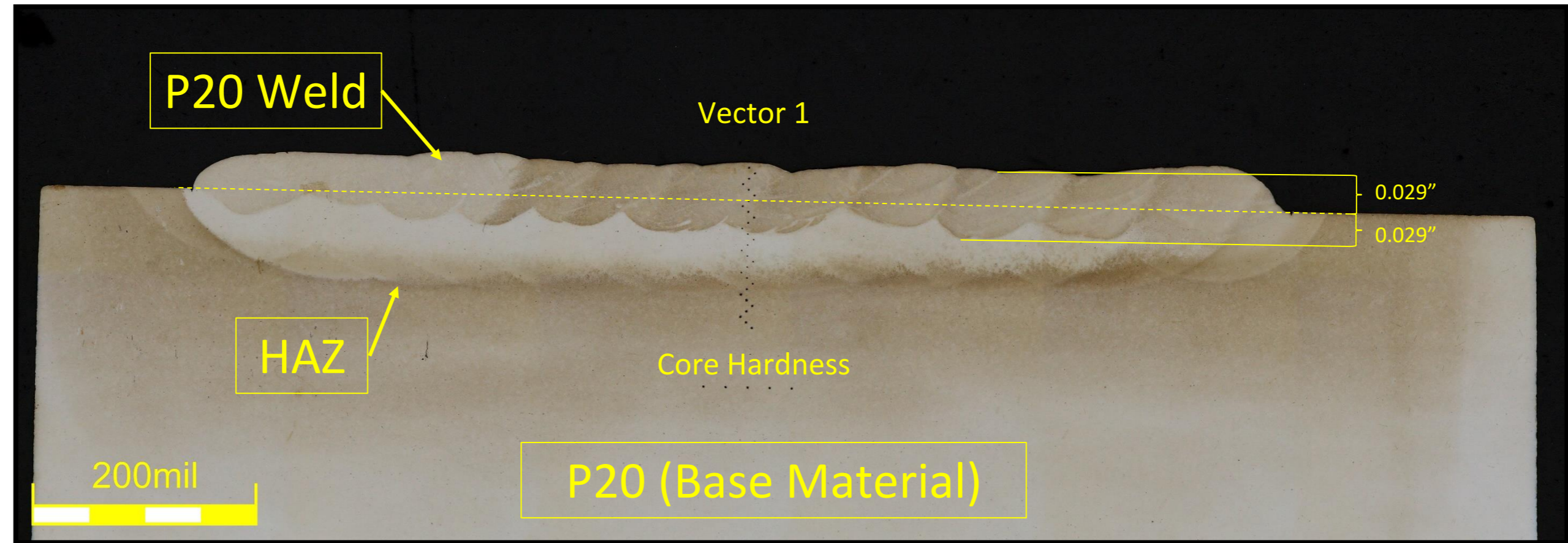
### Sample ID Notes

[D854 - Laser](#)

[D854 Core Hardness](#)

[D855 - Tig](#)

[D855 Core Hardness](#)



### Notes

Build up: 0.029"  
Penetration: 0.029"

LASER WELDING & Tig



# PLS Met Lab Report 24148

D855 (Vector 1)

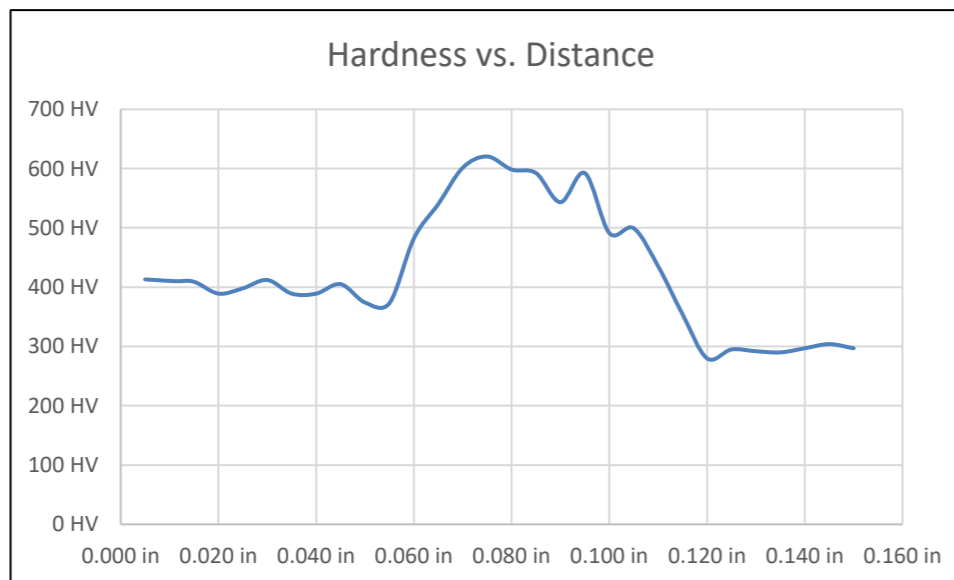
Title Slide

Laser Welding  
 WO#26236-00

Name	Description	Comment	Analysis Date
D855	P20 on P20 Tig Weld	500 gf at 8 sec dwell time	5/17/2024 10:57:56 AM

Indent #	Location	Distance	Hardness	HRC
1		0.005 in	413 HV	42 HRC
2		0.011 in	410 HV	42 HRC
3		0.015 in	409 HV	42 HRC
4		0.020 in	389 HV	40 HRC
5		0.025 in	398 HV	41 HRC
6		0.030 in	412 HV	42 HRC
7		0.035 in	389 HV	40 HRC
8		0.040 in	389 HV	40 HRC
9		0.045 in	405 HV	41 HRC
10		0.050 in	374 HV	38 HRC
11		0.055 in	373 HV	38 HRC
12		0.060 in	482 HV	48 HRC
13		0.065 in	540 HV	52 HRC
14		0.070 in	601 HV	55 HRC
15		0.075 in	620 HV	56 HRC
16		0.080 in	598 HV	55 HRC
17		0.085 in	592 HV	55 HRC
18		0.090 in	543 HV	52 HRC
19		0.095 in	592 HV	55 HRC
20		0.100 in	491 HV	48 HRC
21		0.105 in	499 HV	49 HRC
22		0.110 in	435 HV	44 HRC
23		0.115 in	354 HV	36 HRC
24		0.120 in	280 HV	27 HRC
25		0.125 in	295 HV	29 HRC
26		0.130 in	292 HV	29 HRC
27		0.135 in	290 HV	28 HRC
28		0.140 in	297 HV	29 HRC
29		0.145 in	304 HV	30 HRC
30		0.150 in	297 HV	29 HRC

Maximum	Minimum	Average
620 HV	280 HV	426 HV



**Material**

Base Material

- P20

Filler Metal

- P20

**Reference Documents**

- None

**Sample ID Notes**

[D854 - Laser](#)

[D854 Core Hardness](#)

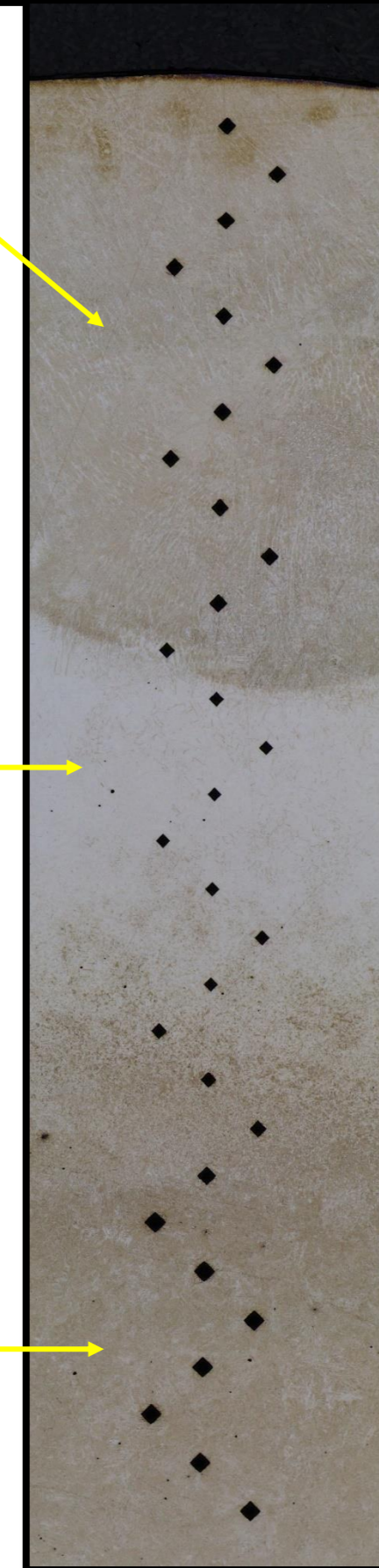
[D855 - Tig](#)

[D855 Core Hardness](#)

P20 Weld

HAZ

P20  
(Base Material)



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LASER WELDING & TIG



# PLS Met Lab Report 24148

## D855 (Core Hardness)

Title Slide

Laser Welding  
 WO#26236-00

Name	Description	Comment	Analysis Date
D855	P20 on P20 Tig Weld	500 gf at 8 sec dwell time	5/17/2024 10:57:56 AM

Indent #	Location	Distance	Hardness	HRC
1		0.020 in	313 HV	31 HRC
2		0.040 in	317 HV	32 HRC
3		0.060 in	316 HV	32 HRC
4		0.080 in	320 HV	32 HRC
5		0.100 in	311 HV	31 HRC

Maximum	Minimum	Average
320 HV	311 HV	315 HV

### Material

Base Material

- P20

Filler Metal

- P20

### Reference Documents

- None

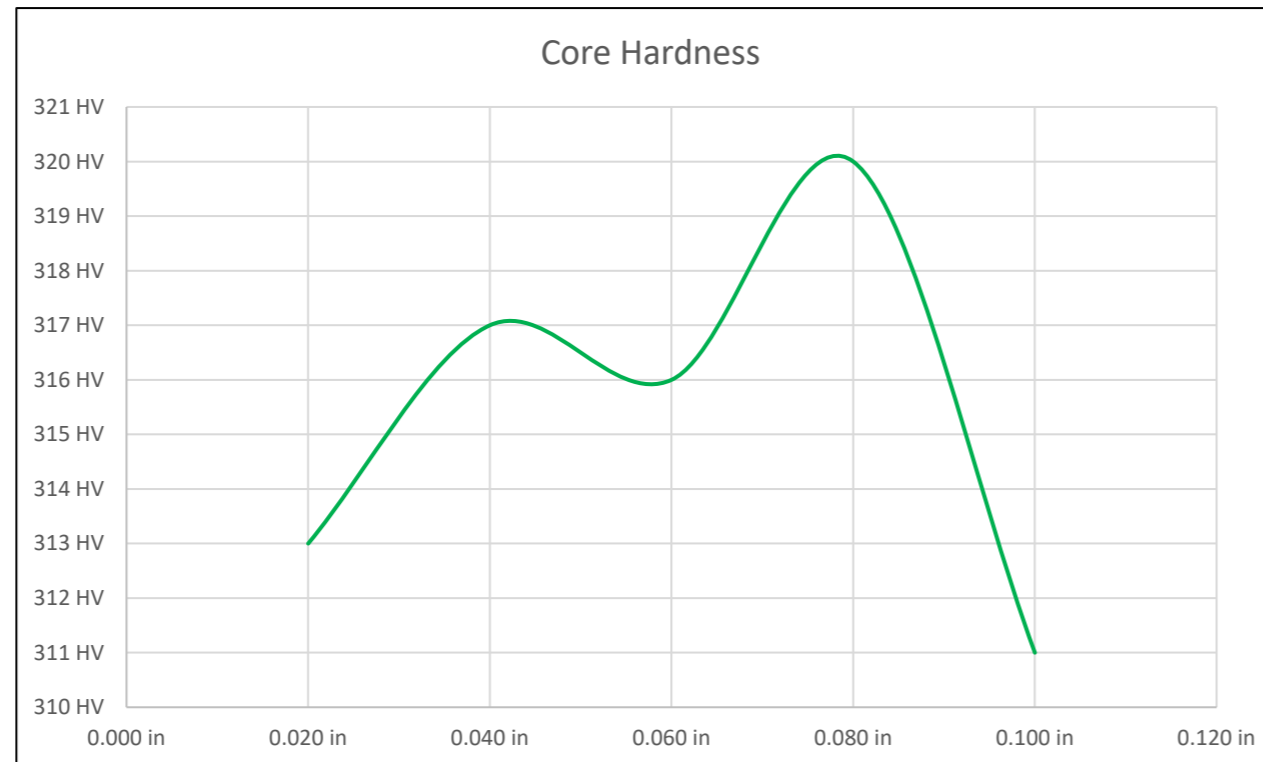
### Sample ID Notes

[D854 - Laser](#)

[D854 Core Hardness](#)

[D855 - Tig](#)

[D855 Core Hardness](#)



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LASER WELDING & Tig



MET Lab Report 24148



THANK  
YOU.

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