

UT Wedge and Material Frequency Filtering Study

By Jimmy Ellis, revised May 11, 2021

Data was recorded June 20, 2017 using the Olympus Omniscan phased array UT (ultrasonic testing) platform and it's FFT (Fast Fourier Transform) function.

Materials tested were:

- Steel
- Perspex
- PMMA
- Plexiglass
- Rexolite

Conclusions:

- There can be significant loss of the higher frequencies in different materials and thicknesses.
- Pitch-Catch was much more transmissive of the higher frequencies than Pulse-Echo.
- For steel in pulse-echo, more steel thickness resulted in more loss of higher frequencies.
- PMMA, Plexiglass, and Rexolite in Pitch-Catch a higher proportion of all frequencies was transmitted when the amount of wedge material in the sound path was less than 0.5" (12.7mm).

Special thanks to Emilie Peloquin of Olympus for guidance on use of the FFT function.

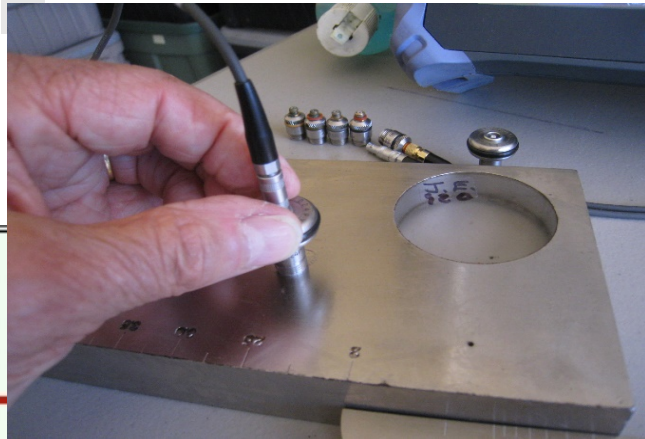
Excel Tab	Pulse-Echo	Pitch-Catch	1.0"thk steel	0.5" thk steel	0.92"thk perspex	0.5" thk Rexolite	0.5" thk Plexiglass	0.425" thk PMMA	0.555" soundpath Rexolite to Rexolite	0.34" soundpath Plexiglass to Plexiglass	0.355" soundpath PMMA to PMMA	2.25M Hz	5.0MH z	7.5MH z	10.0 MHz	15.0 MHz	A-gate threshold 25%	A-gate threshold 7%
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Excel Tab	Pulse-Echo	Pitch-Catch	1.0"thk steel	0.5" thk steel	0.92"thk perspex	0.5" thk Rexolite	0.5" thk Plexiglass	0.425" thk PMMA	0.555" soundpath Rexolite to Rexolite	0.34" soundpath Plexiglass to Plexiglass	0.355" soundpath PMMA to PMMA	2.25M Hz	5.0MH z	7.5MH z	10.0 MHz	15.0 MHz	A-gate threshold 25%	A-gate threshold 7%
36																		
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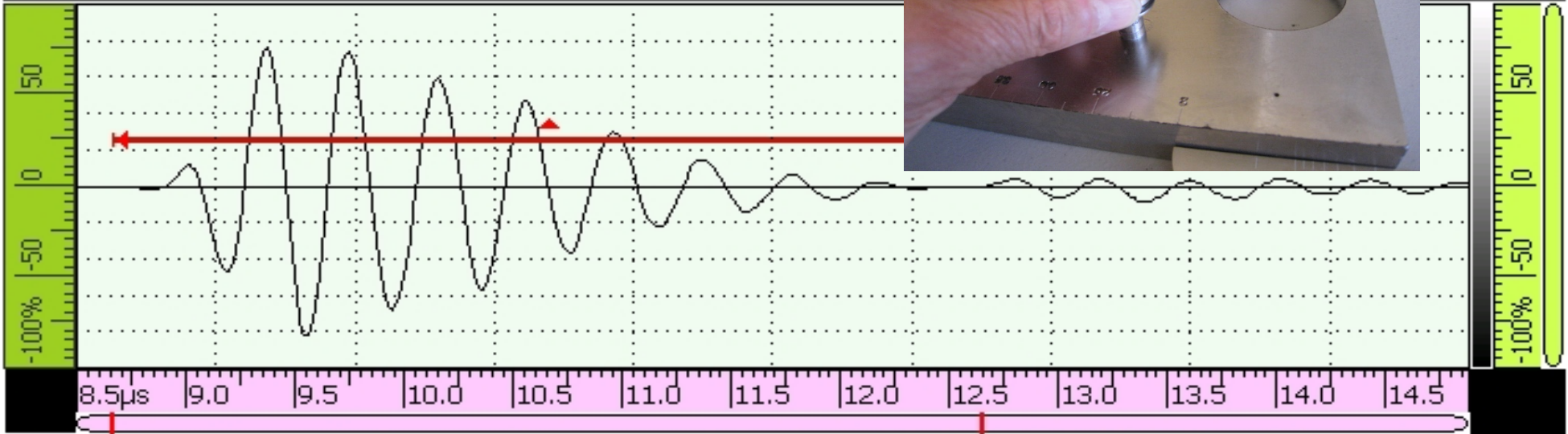
Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0007.jpg
 "Report Preview" as: File0008.htm
 Excel tab: 1

**2.25
 MHz**

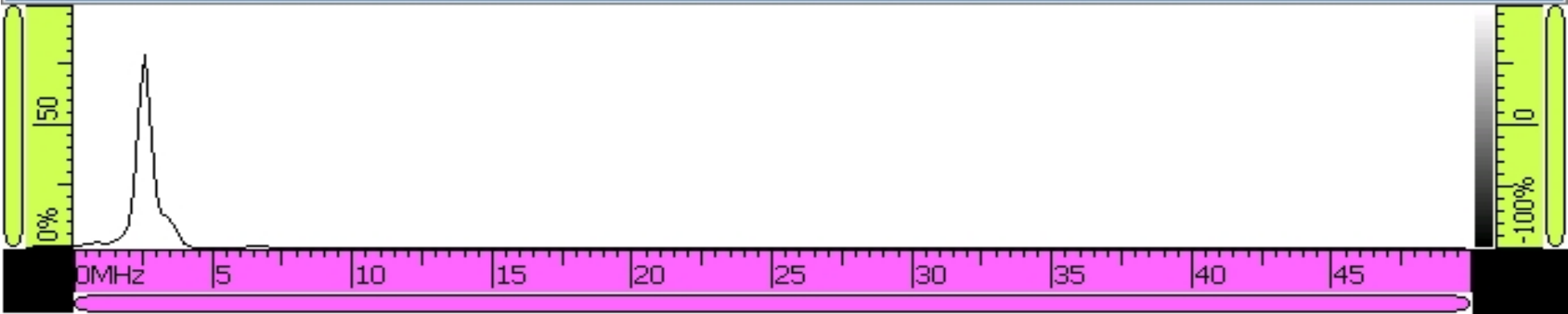
set-up photo:



gate
 threshold:
25%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.54 MHz
-6 dB	2.15 MHz	2.93 MHz	2.54 MHz	0.78 MHz	30.77 %		
-20 dB	1.76 MHz	3.71 MHz	2.73 MHz	1.95 MHz	71.43 %		



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0008.jpg
 "Report Preview" as: File0009.htm
 Excel tab: 2

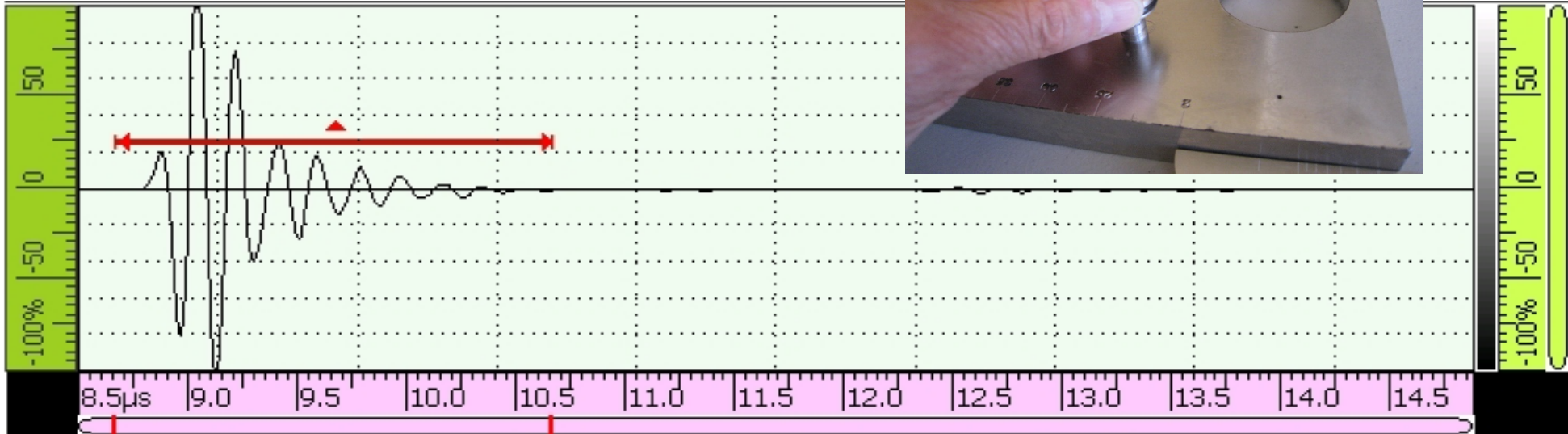
5.0 MHz

set-up photo:

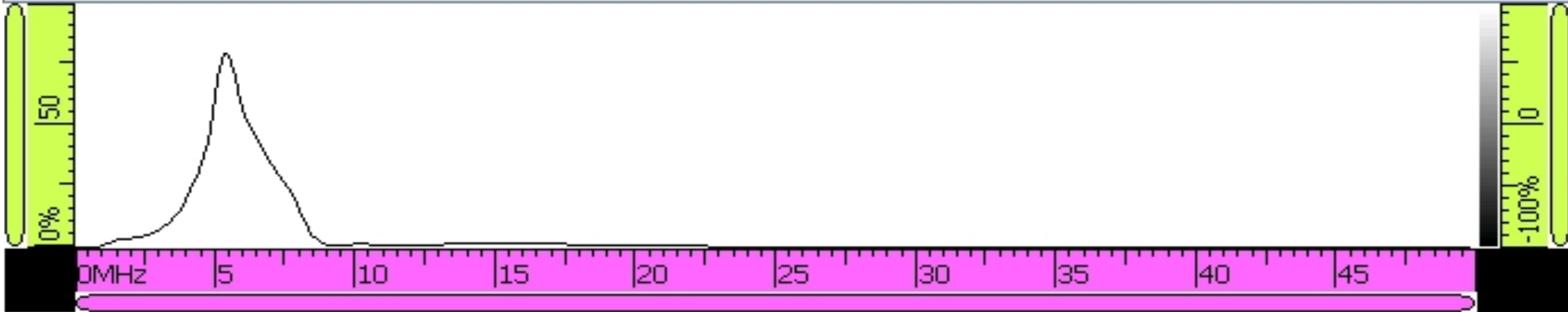


gate threshold:

25%



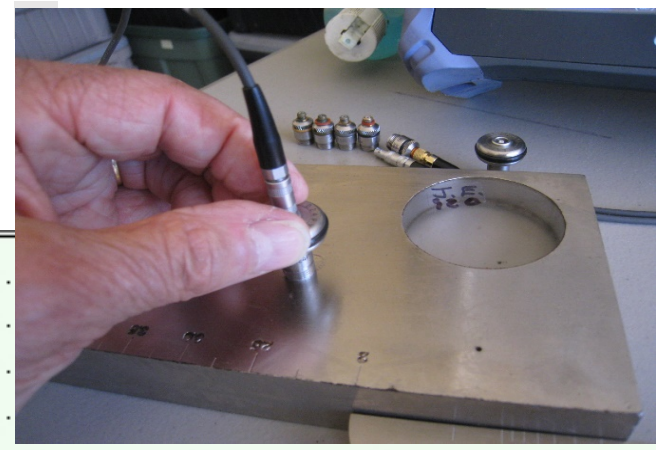
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.27 MHz
-6 dB	4.49 MHz	6.84 MHz	5.66 MHz	2.34 MHz	41.38 %		
-20 dB	2.93 MHz	8.40 MHz	5.66 MHz	5.47 MHz	96.55 %		



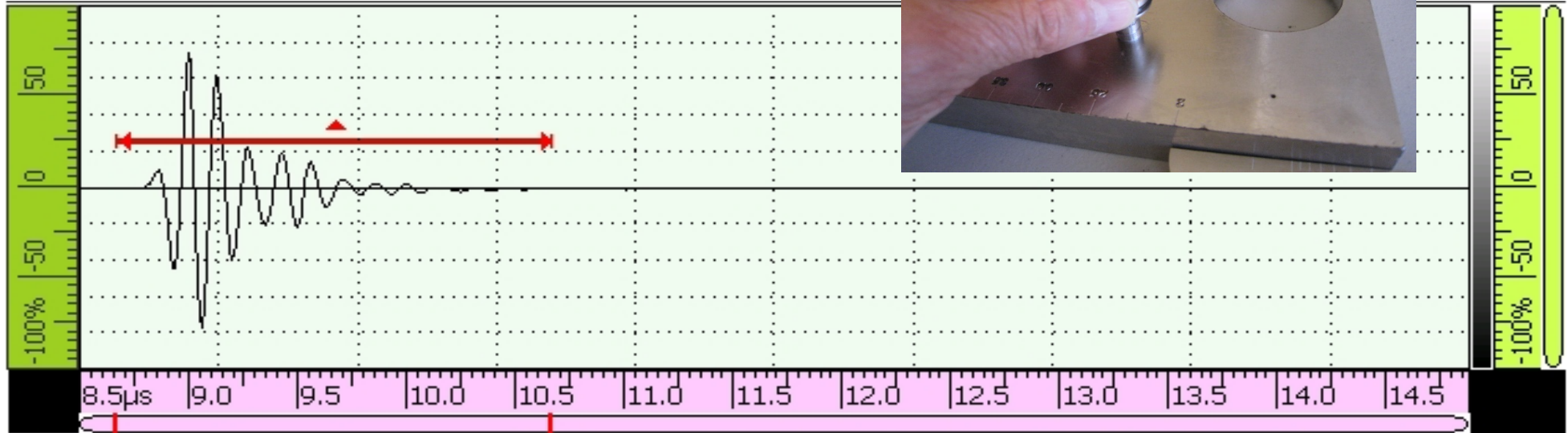
Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0009.jpg
 "Report Preview" as: File0010.htm
 Excel tab: 3

7.5 MHz

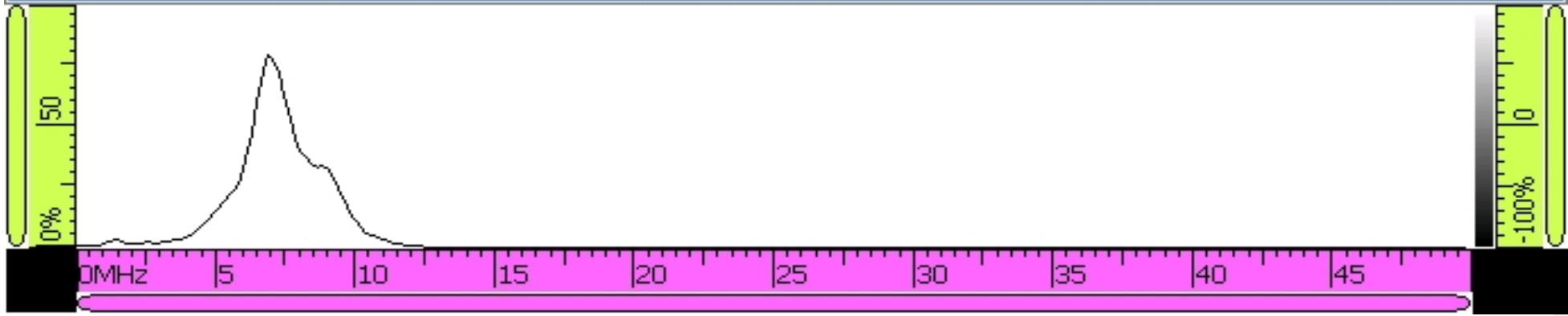
set-up photo:
 S/N:
 022W3N



gate
 threshold:
25%



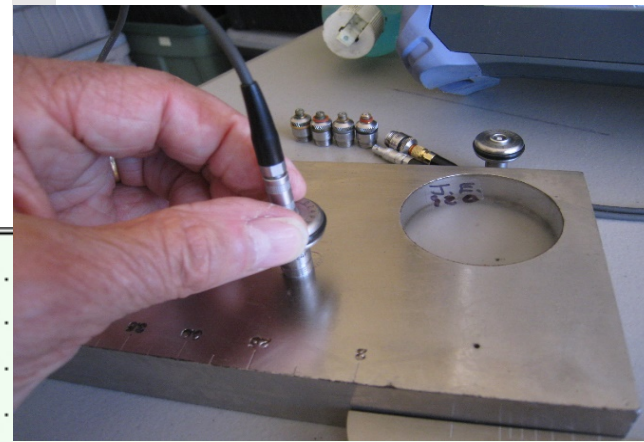
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	6.84 MHz
-6 dB	6.05 MHz	8.20 MHz	7.13 MHz	2.15 MHz	30.14 %		
-20 dB	4.30 MHz	10.35 MHz	7.32 MHz	6.05 MHz	82.67 %		



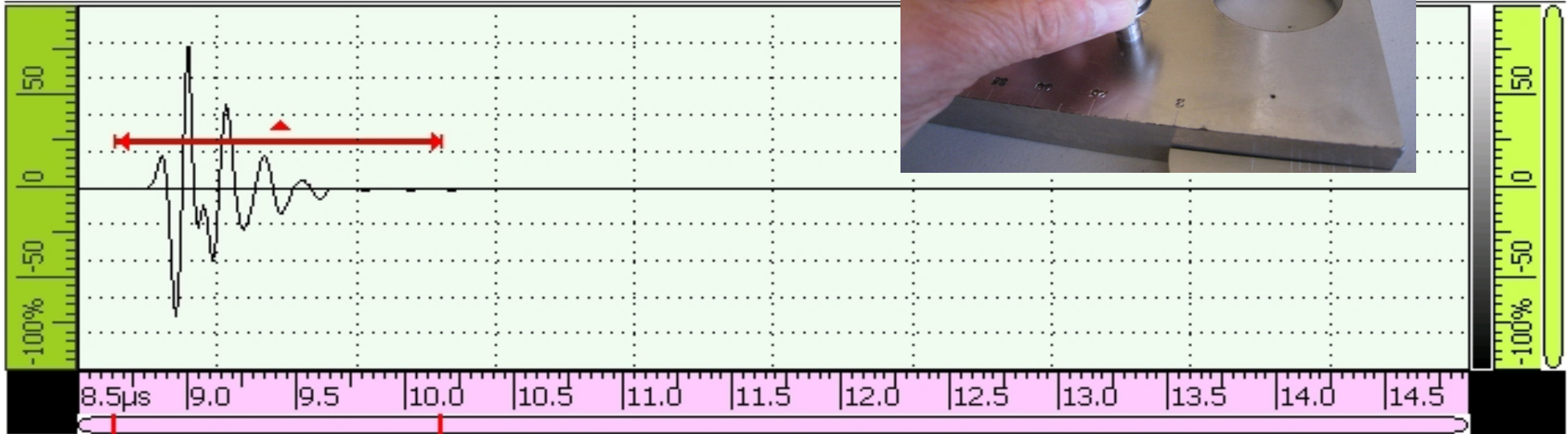
Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0012.jpg
 "Report Preview" as: File0013.htm
 Excel tab: 4

**10.0
MHz**

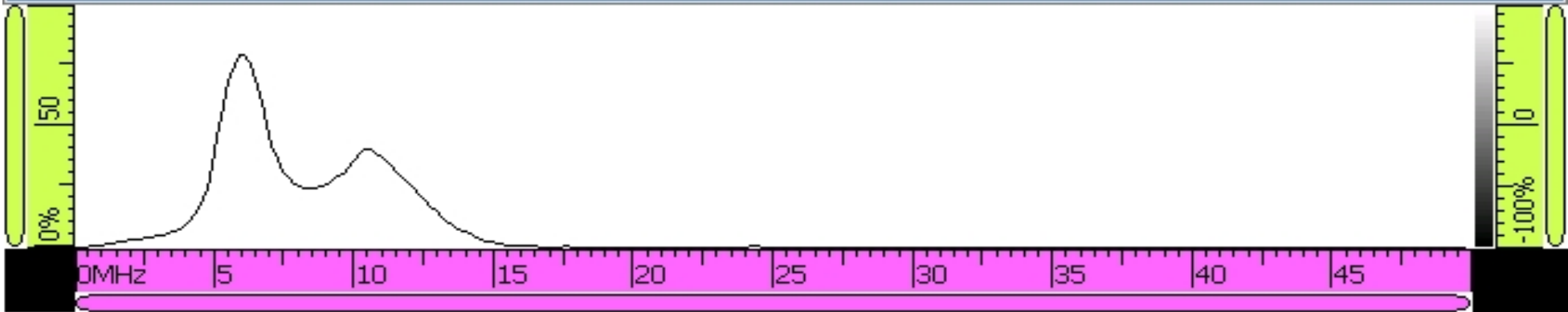
set-up photo:



gate
threshold:
25%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	6.05 MHz
-6 dB	4.88 MHz	7.23 MHz	6.05 MHz	2.34 MHz	38.71 %		
-20 dB	3.71 MHz	13.67 MHz	8.69 MHz	9.96 MHz	114.61 %		



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0013.jpg
 "Report Preview" as: File0014.htm
 Excel tab: 5

**10.0
MHz**

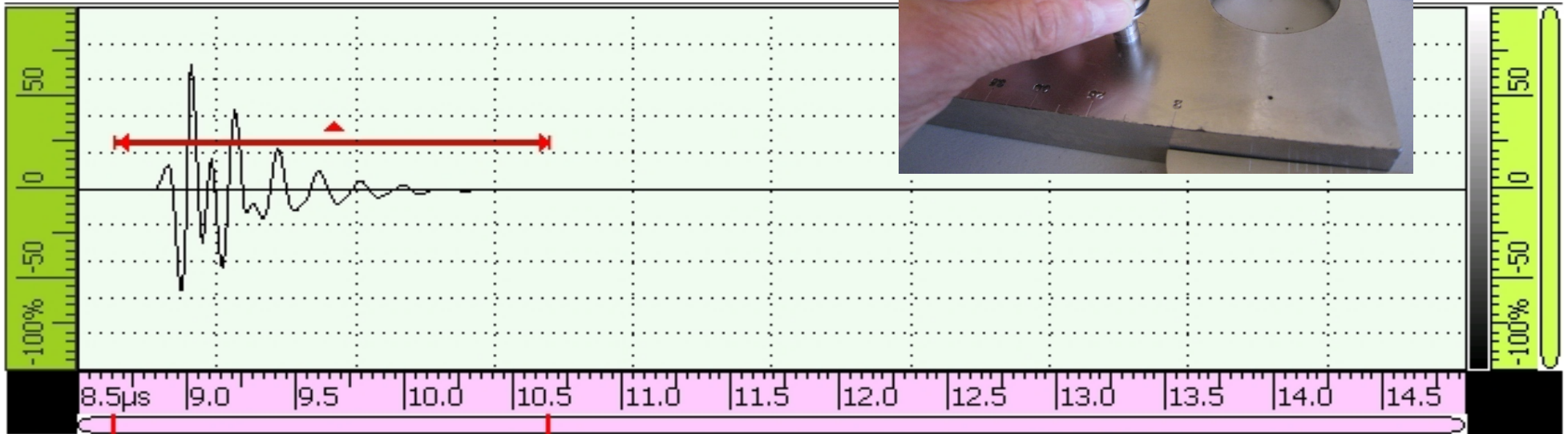
set-up photo:

S/N:
021TTM

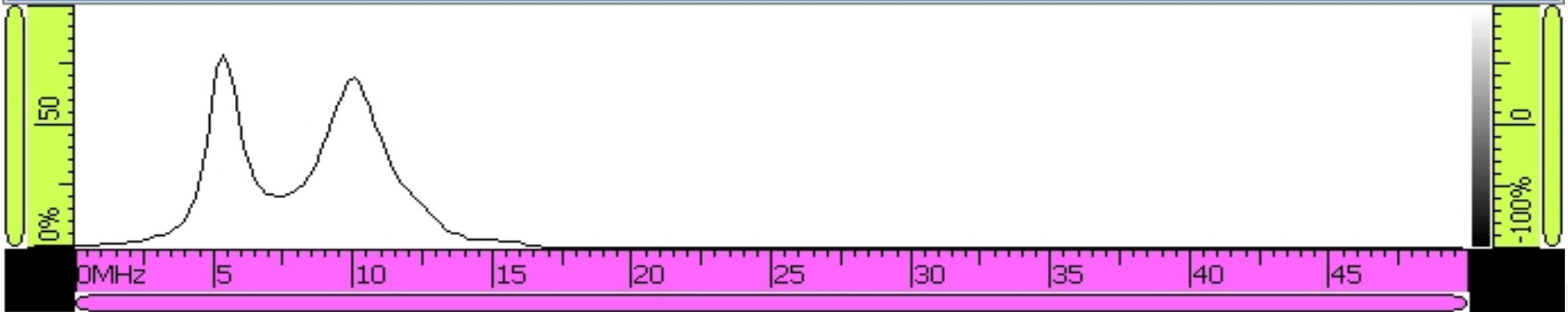


gate
threshold:

25%



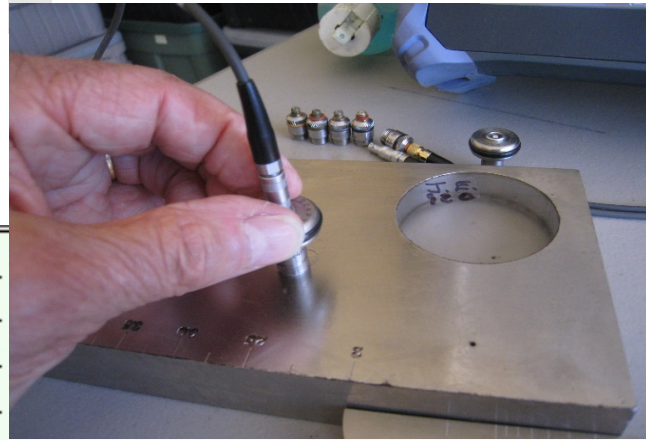
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.27 MHz
-6 dB	4.49 MHz	6.25 MHz	5.37 MHz	1.76 MHz	32.73 %		
-20 dB	3.52 MHz	13.28 MHz	8.40 MHz	9.77 MHz	116.28 %		



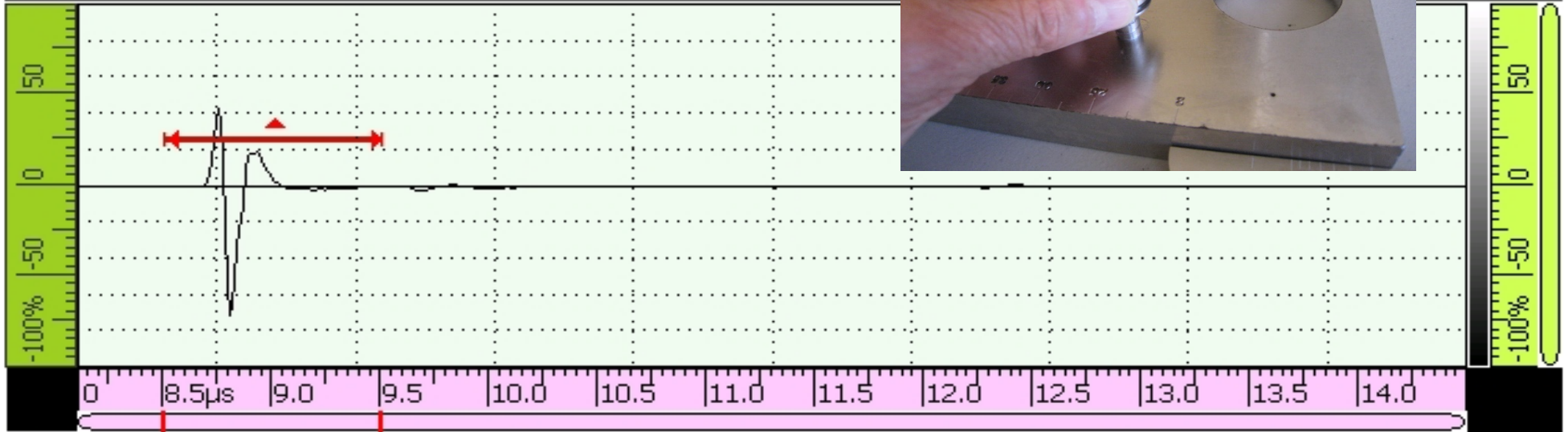
Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0015.jpg
 "Report Preview" as: File0016.htm
 Excel tab: 6

**15.0
 MHz**

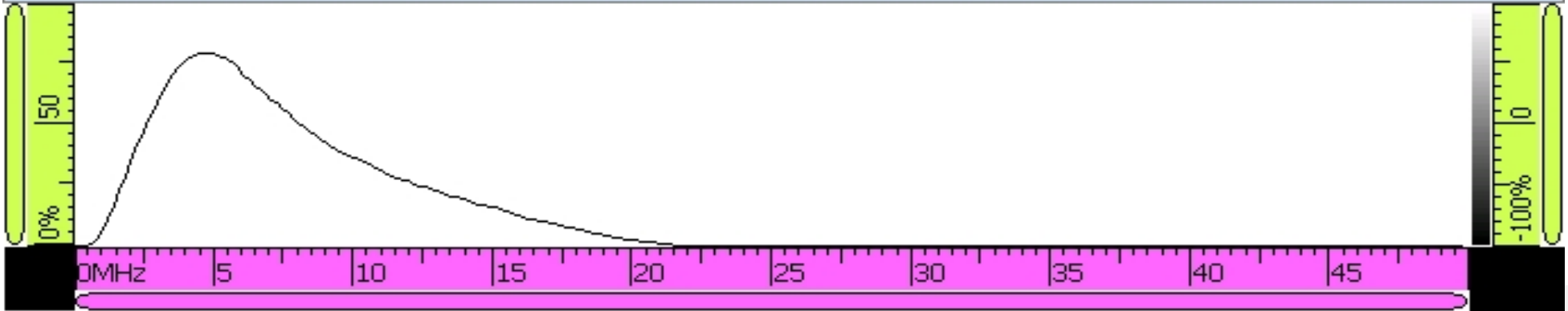
set-up photo:



gate
 threshold:
25%



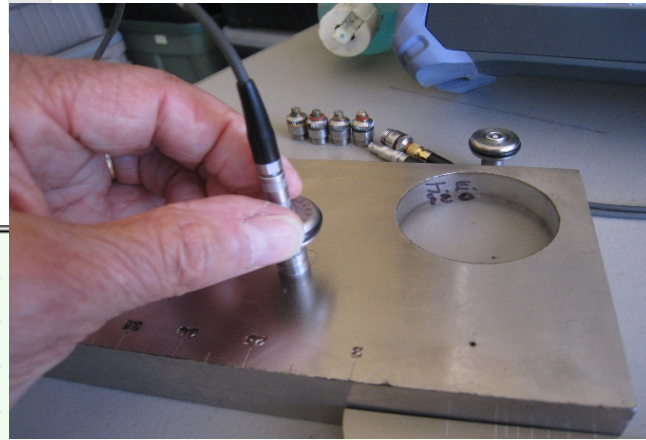
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.69 MHz
-6 dB	1.95 MHz	9.38 MHz	5.66 MHz	7.42 MHz	131.03 %		
-20 dB	0.98 MHz	17.58 MHz	9.28 MHz	16.60 MHz	178.95 %		



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0014.jpg
 "Report Preview" as: File0015.htm
 Excel tab: 7

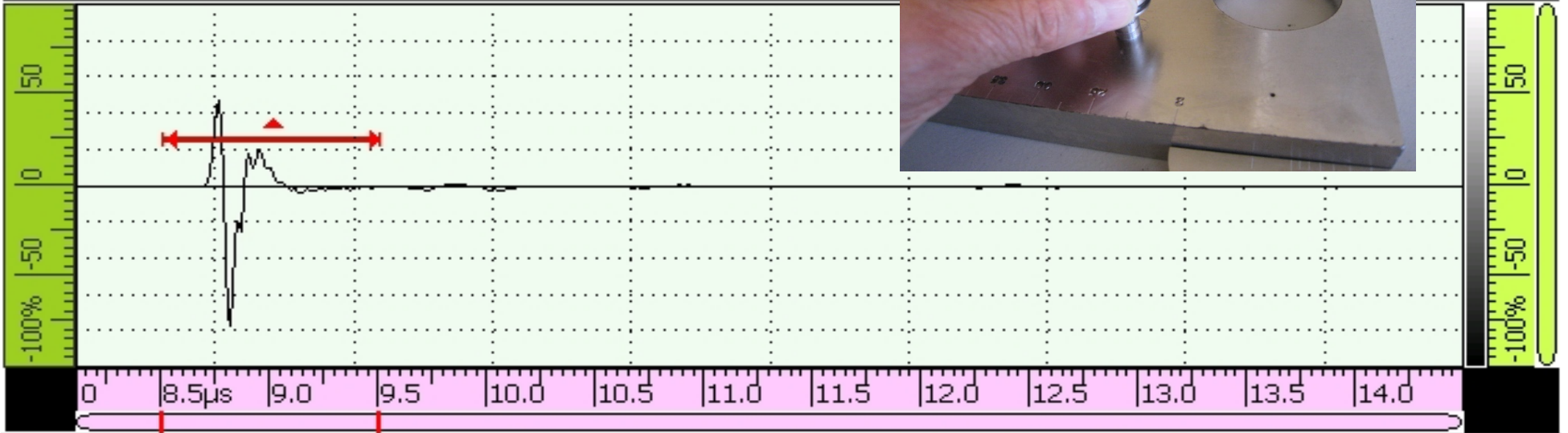
**15.0
MHz**

set-up photo:

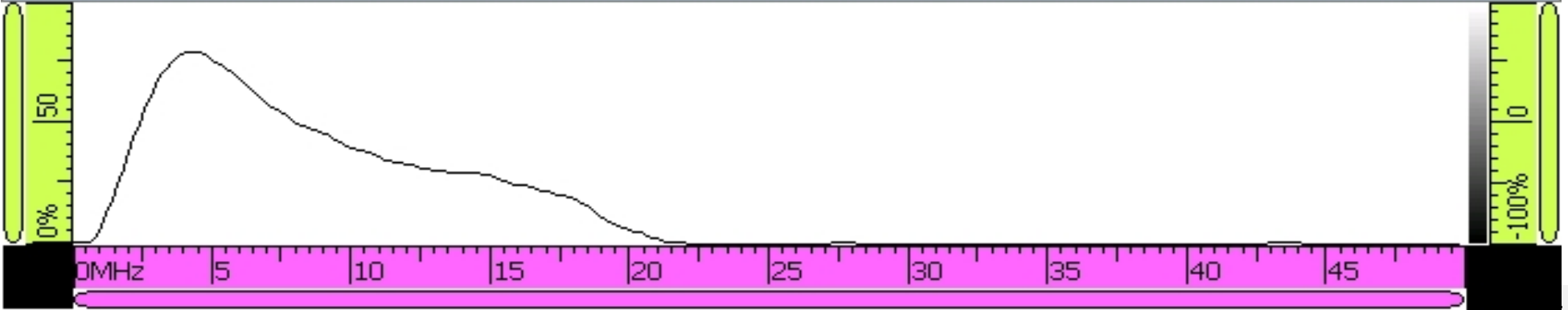


gate
threshold:

25%



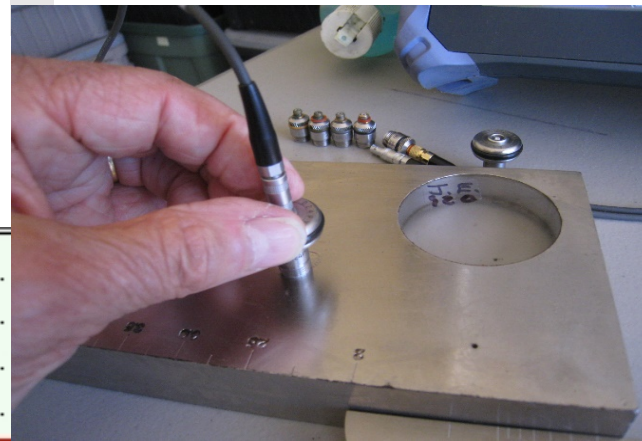
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:
-6 dB	1.95 MHz	9.96 MHz	5.96 MHz	8.01 MHz	134.43 %	4.30 MHz
-20 dB	0.98 MHz	19.53 MHz	10.25 MHz	18.55 MHz	180.95 %	



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0017.jpg
 "Report Preview" as: File0017.htm
 Excel tab: 8

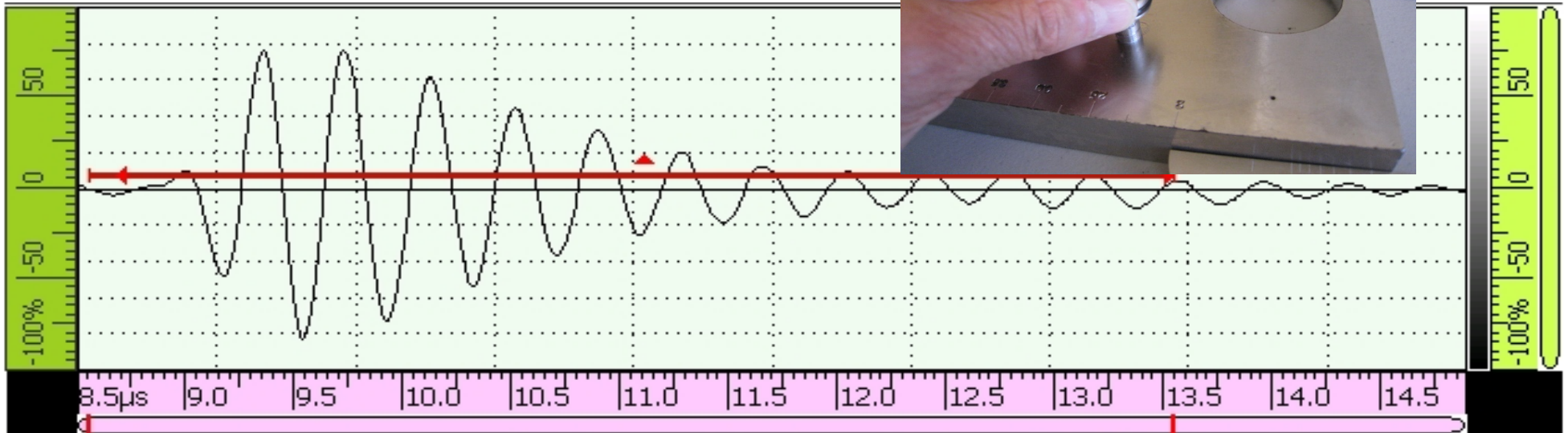
**2.25
 MHz**

set-up photo:

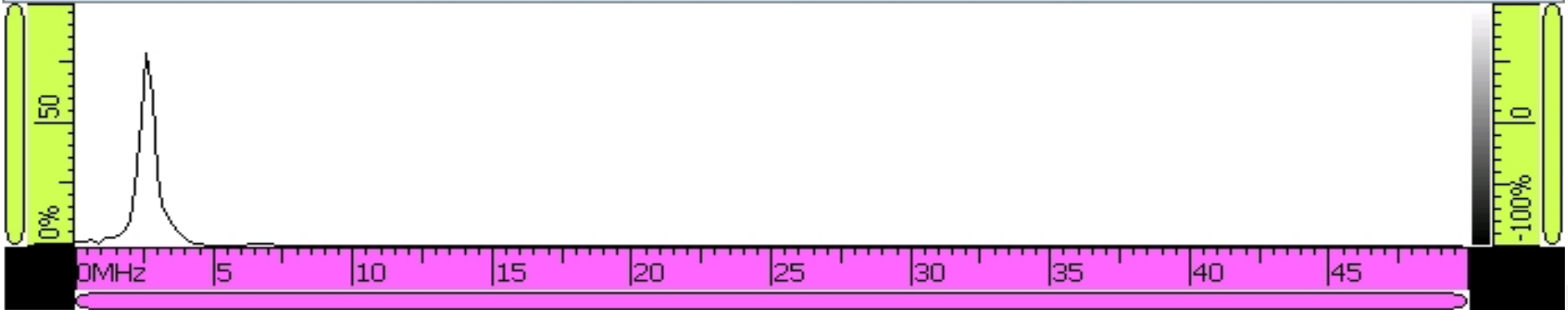


gate
 threshold:

7%



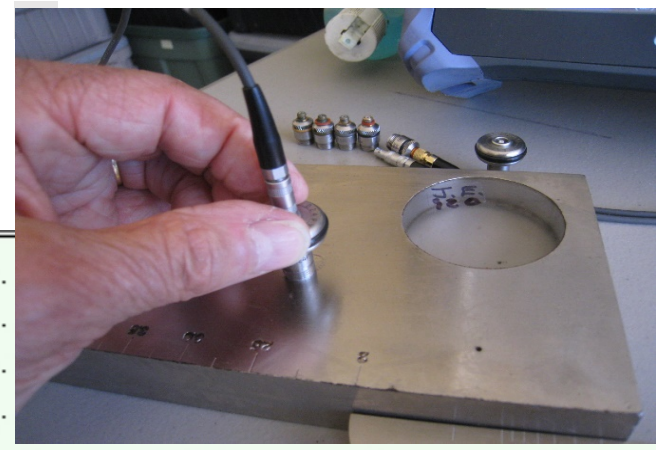
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.54 MHz
-6 dB	2.15 MHz	2.93 MHz	2.54 MHz	0.78 MHz	30.77 %		
-20 dB	1.76 MHz	3.71 MHz	2.73 MHz	1.95 MHz	71.43 %		



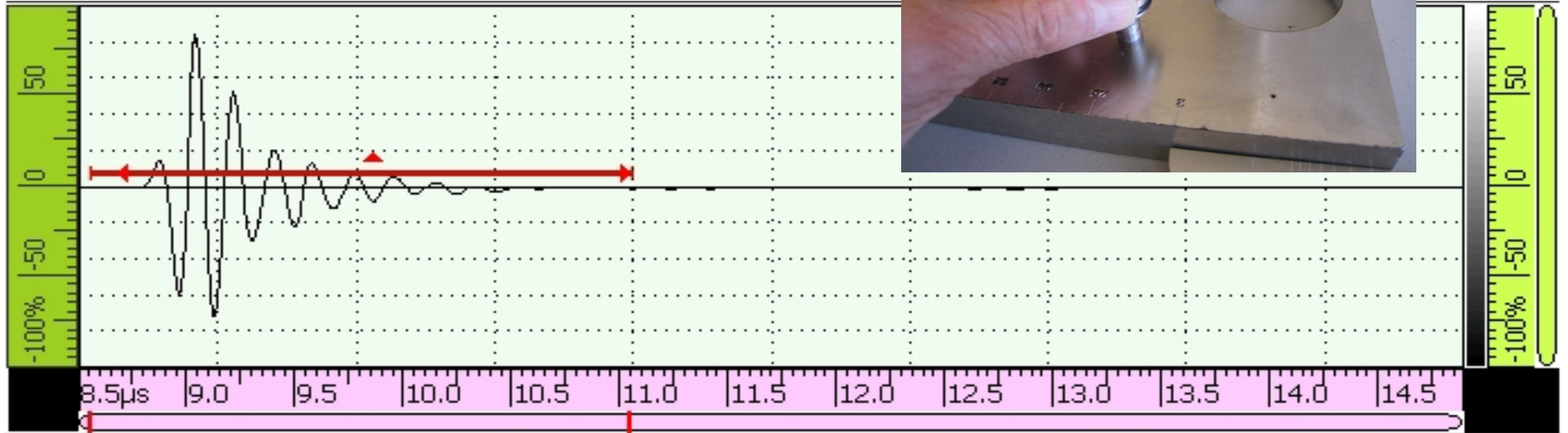
Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0018.jpg
 "Report Preview" as: File0018.htm
 Excel tab: 9

5.0 MHz

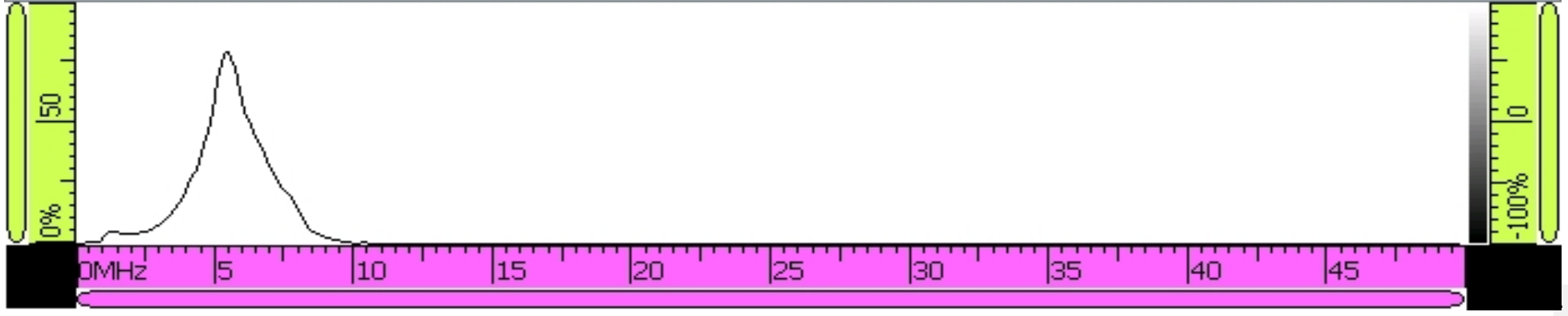
set-up photo:



gate
 threshold:
7%



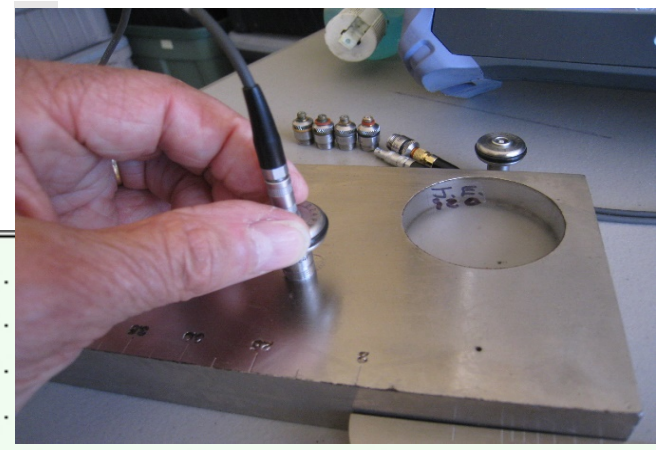
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.47 MHz
-6 dB	4.49 MHz	6.64 MHz	5.57 MHz	2.15 MHz	38.60 %		
-20 dB	2.93 MHz	8.40 MHz	5.66 MHz	5.47 MHz	96.55 %		



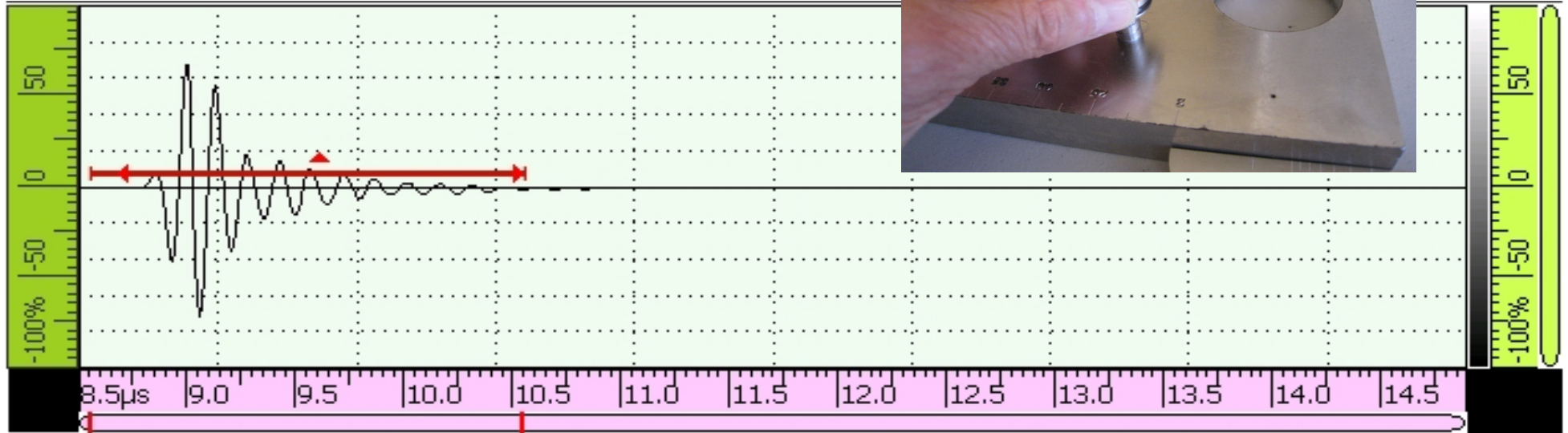
Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0019.jpg
 "Report Preview" as: File0019.htm
 Excel tab: 10

7.5 MHz

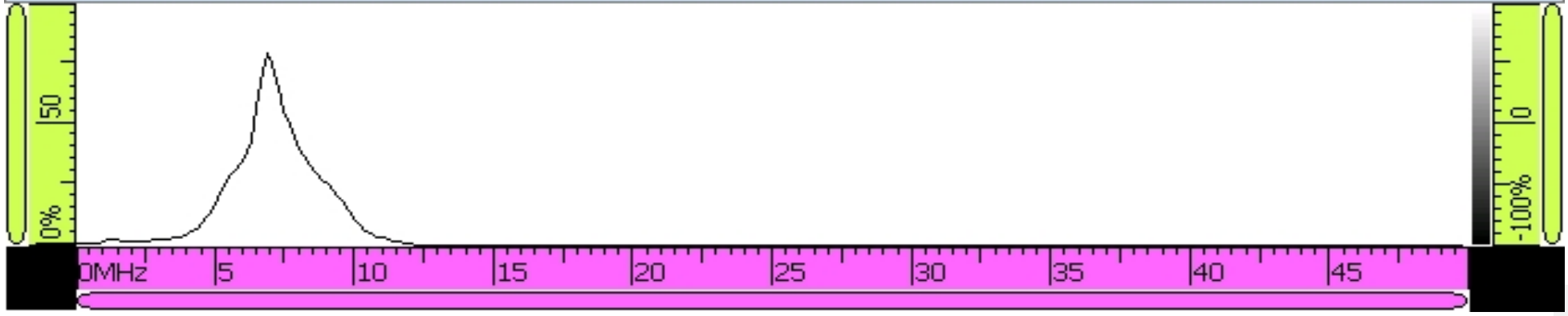
set-up photo:
 S/N:
 022W3N



gate
 threshold:
7%



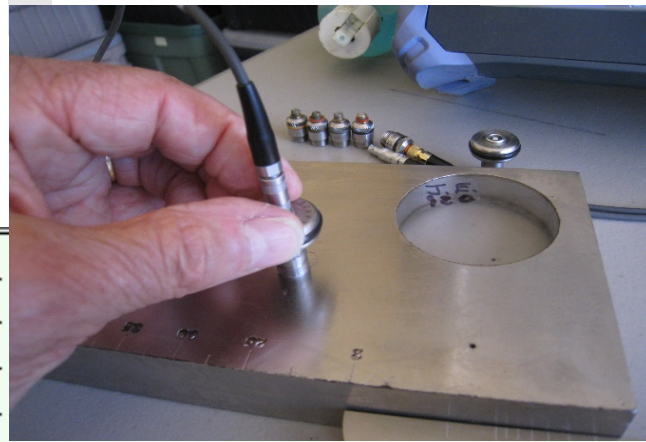
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	6.84 MHz
-6 dB	6.05 MHz	8.20 MHz	7.13 MHz	2.15 MHz	30.14 %		
-20 dB	4.30 MHz	10.35 MHz	7.32 MHz	6.05 MHz	82.67 %		



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0020.jpg
 "Report Preview" as: File0020.htm
 Excel tab: 11

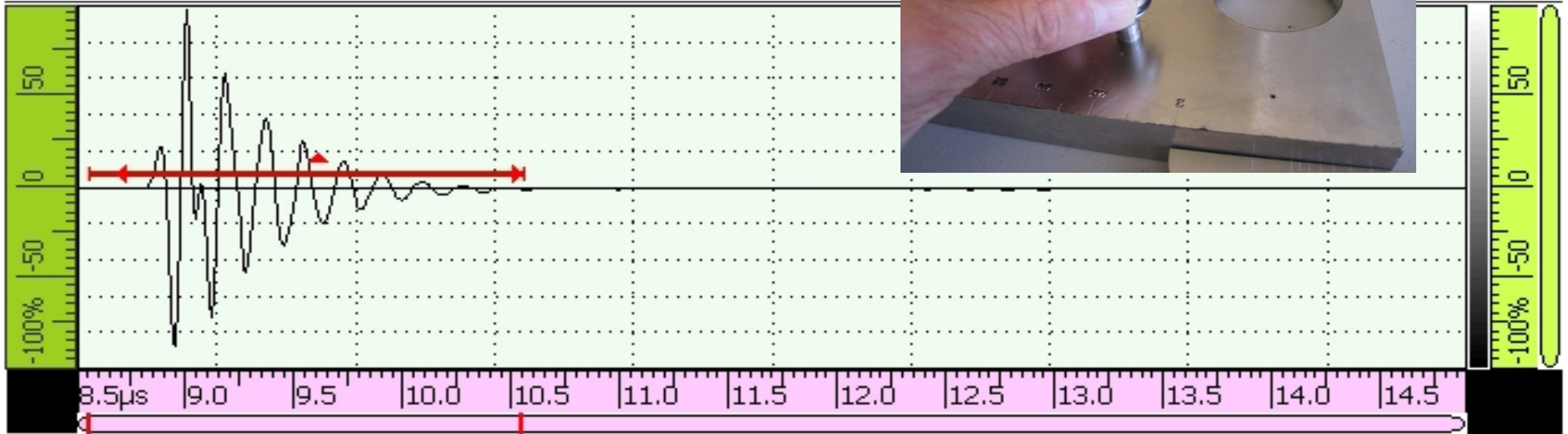
**10.0
 MHz**

set-up photo:

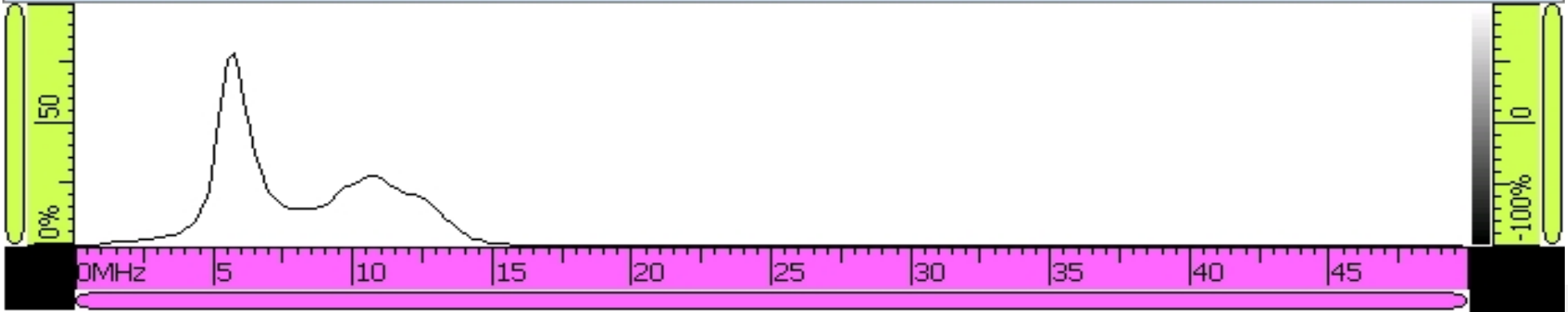


gate
 threshold:

7%



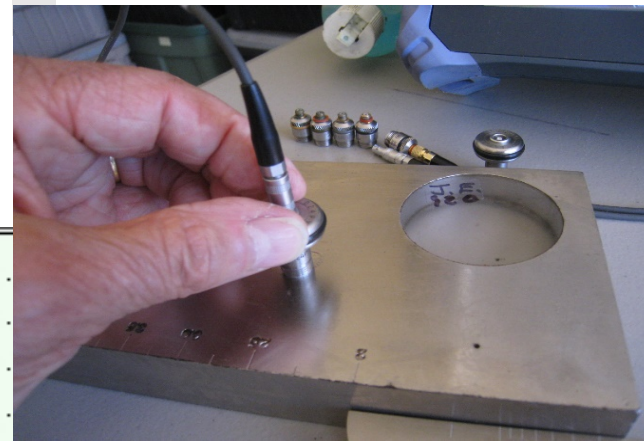
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.66 MHz
-6 dB	4.88 MHz	6.45 MHz	5.66 MHz	1.56 MHz	27.59 %		
-20 dB	4.10 MHz	13.67 MHz	8.89 MHz	9.57 MHz	107.69 %		



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0021.jpg
 "Report Preview" as: File0021.htm
 Excel tab: 12

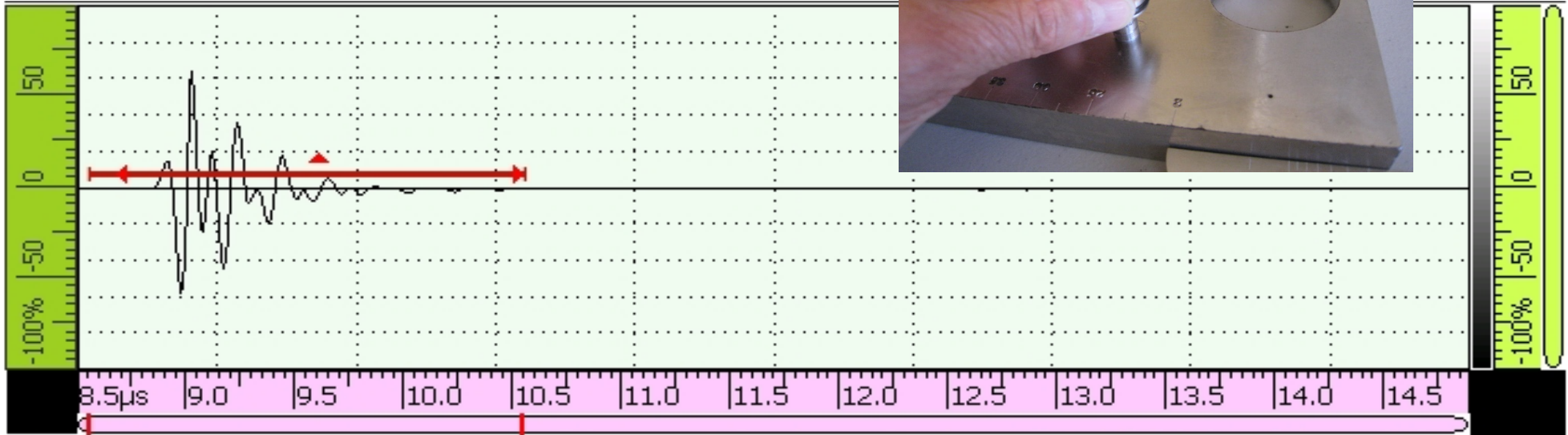
**10.0
MHz**

set-up photo:

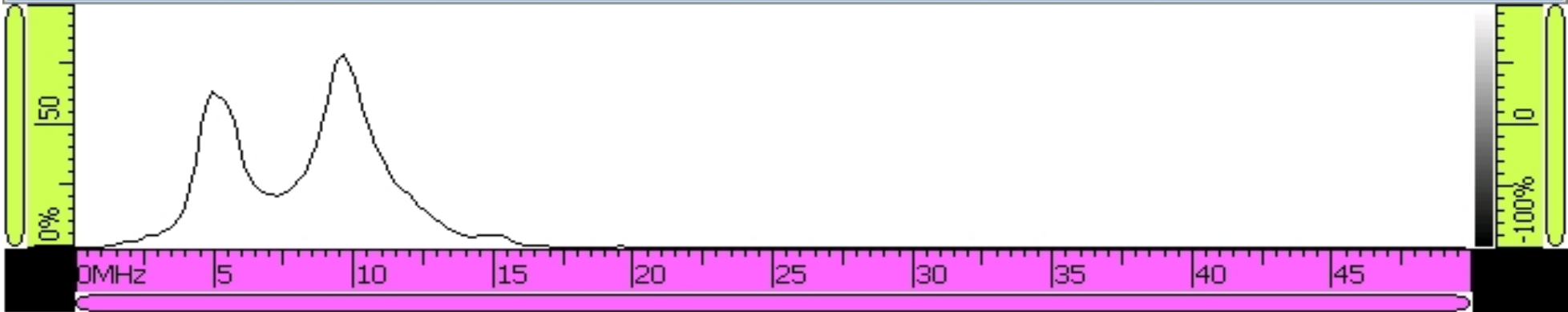


gate
threshold:

7%



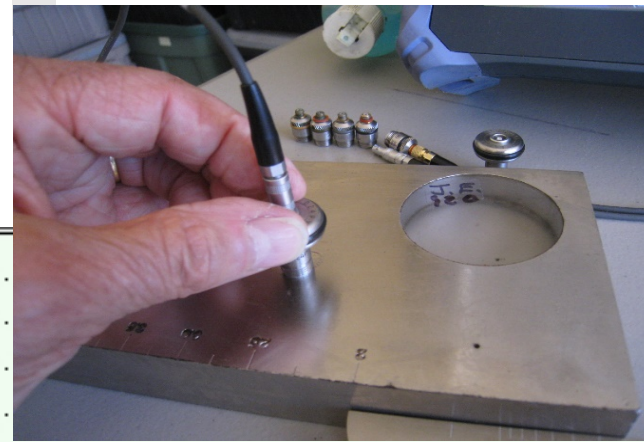
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:
-6 dB	8.40 MHz	10.94 MHz	9.67 MHz	2.54 MHz	26.26 %	9.57 MHz
-20 dB	3.32 MHz	13.48 MHz	8.40 MHz	10.16 MHz	120.93 %	



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0023.jpg
 "Report Preview" as: File0023.htm
 Excel tab: 13

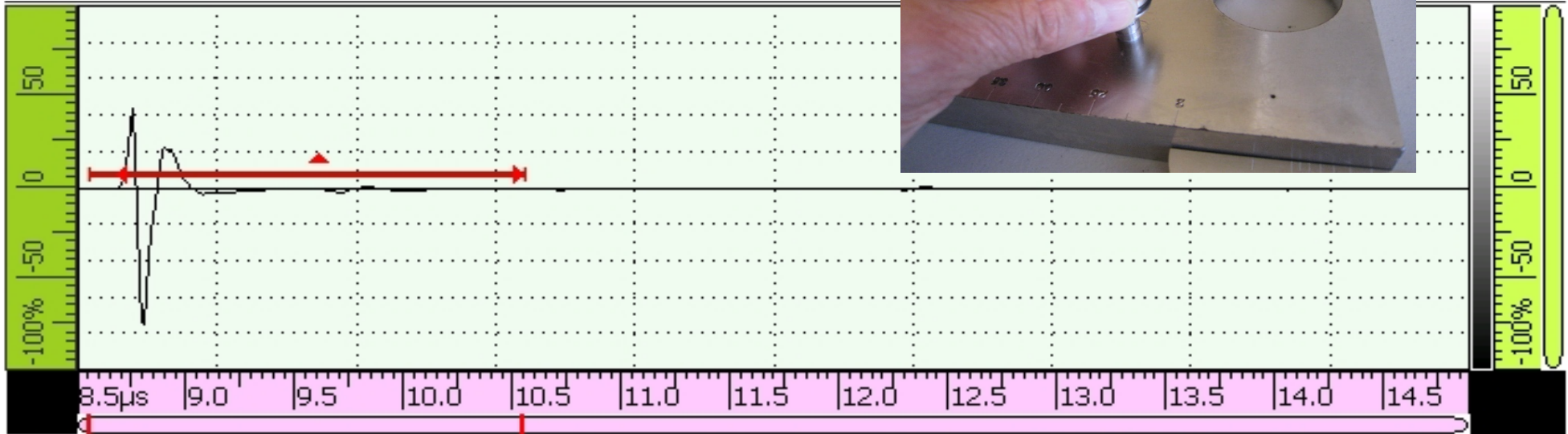
**15.0
MHz**

set-up photo:

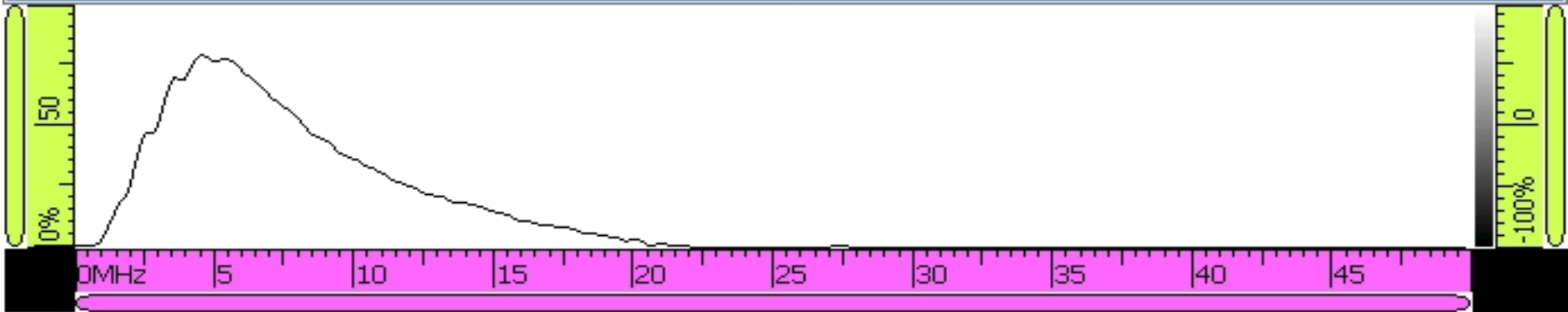


gate
threshold:

7%



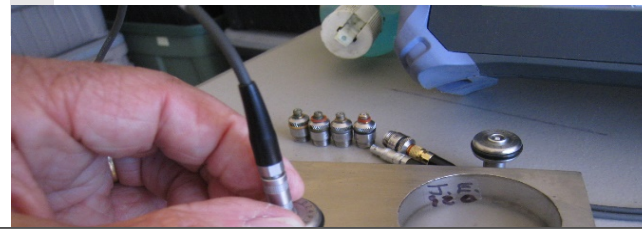
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.49 MHz
-6 dB	2.15 MHz	9.57 MHz	5.86 MHz	7.42 MHz	126.67 %		
-20 dB	0.98 MHz	17.77 MHz	9.38 MHz	16.80 MHz	179.17 %		



Mode: **Pulse-Echo**
 material 1.0" thk steel
 "Save Image" as: File0024.jpg
 "Report Preview" as: File0024.htm
 Excel tab: 14

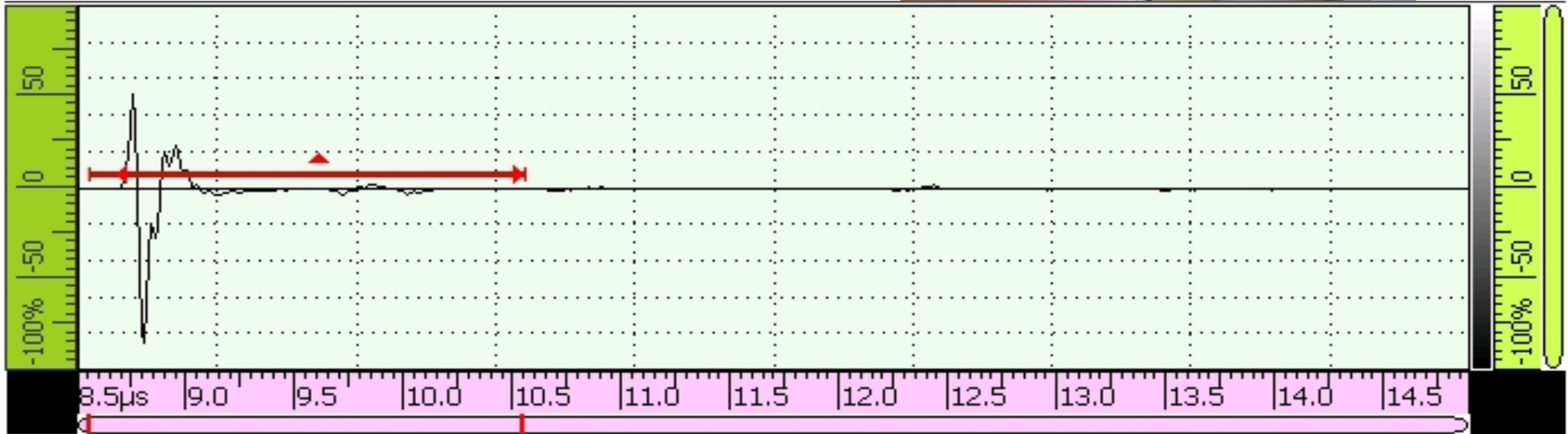
**15.0
MHz**

set-up photo:

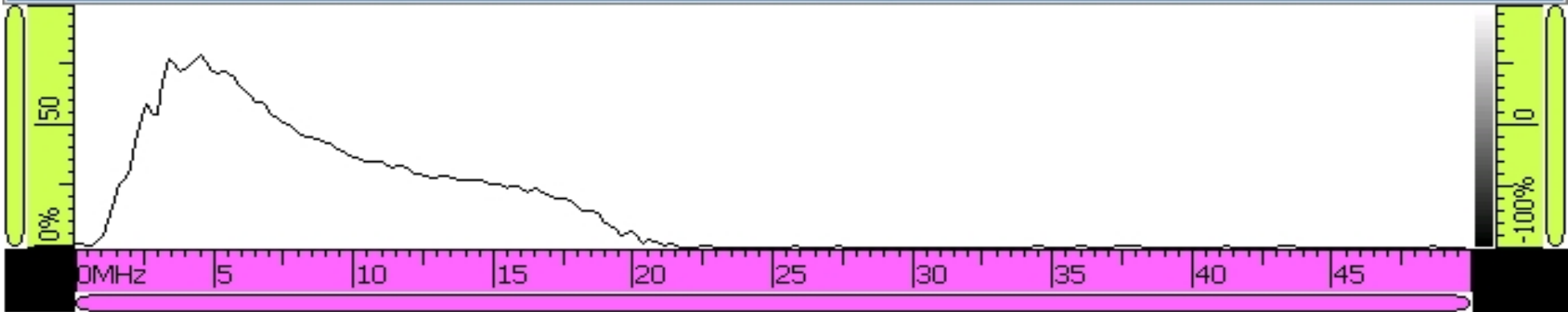


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.49 MHz
-6 dB	1.95 MHz	9.57 MHz	5.76 MHz	7.62 MHz	132.20 %		
-20 dB	0.98 MHz	19.34 MHz	10.16 MHz	18.36 MHz	180.77 %		



Mode: **Pulse-Echo**
 material 0.5" thk steel
 "Save Image" as: File0025.jpg
 "Report Preview" as: File0025.htm
 Excel tab: 15

**2.25
 MHz**

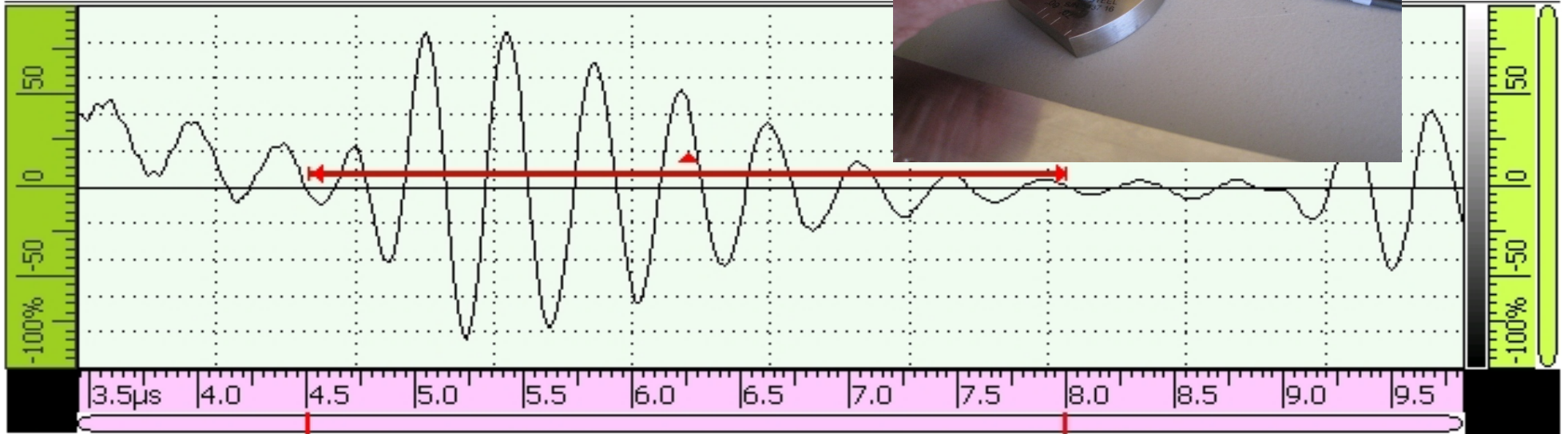
set-up photo:

S/N:
 011DHW

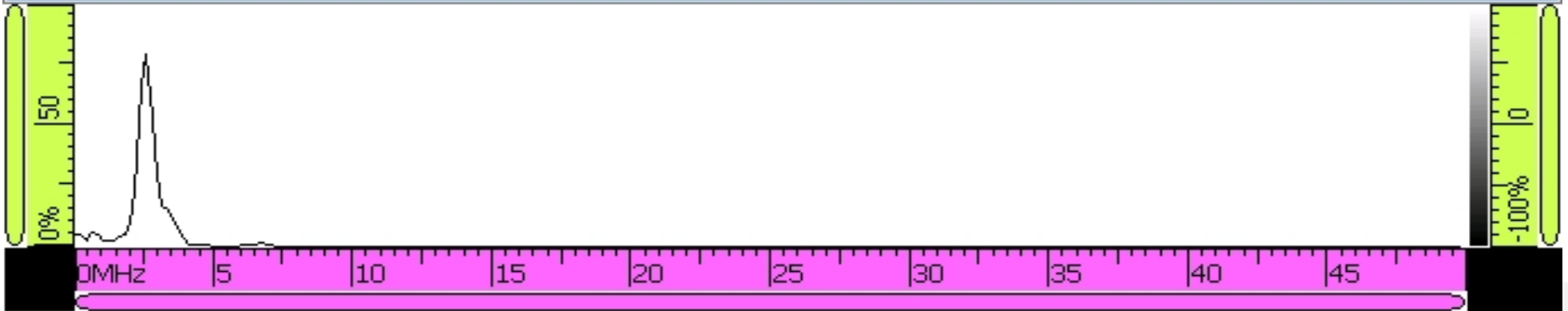


gate
 threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.54 MHz
-6 dB	2.15 MHz	2.93 MHz	2.54 MHz	0.78 MHz	30.77 %		
-20 dB	1.76 MHz	3.71 MHz	2.73 MHz	1.95 MHz	71.43 %		



Mode: **Pulse-Echo**
 material 0.5" thk steel
 "Save Image" as: File0026.jpg
 "Report Preview" as: File0026.htm
 Excel tab: 16

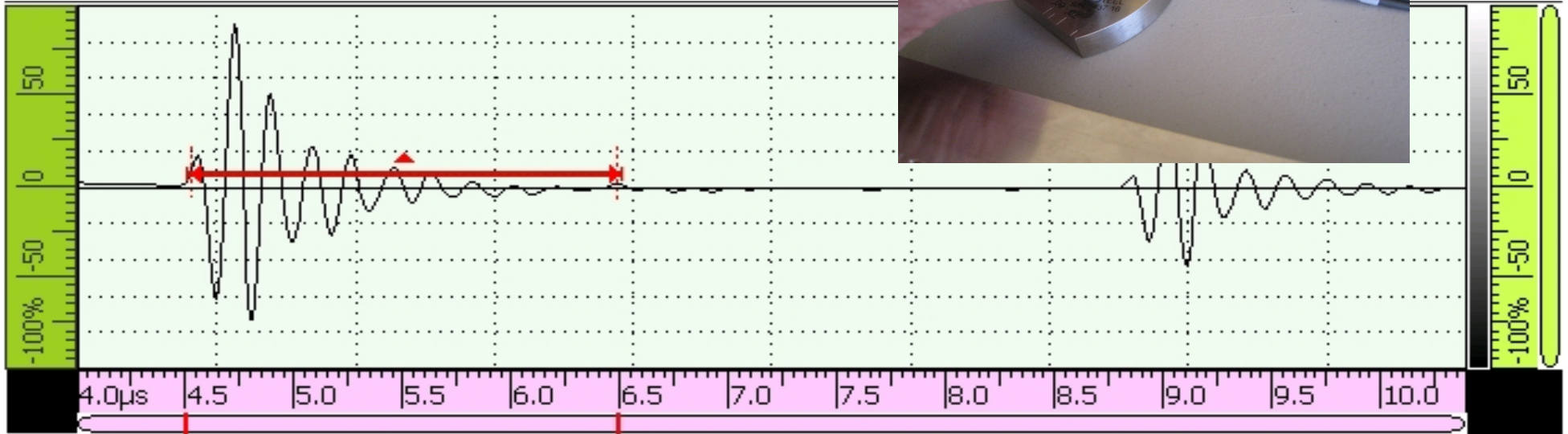
5.0 MHz

set-up photo:

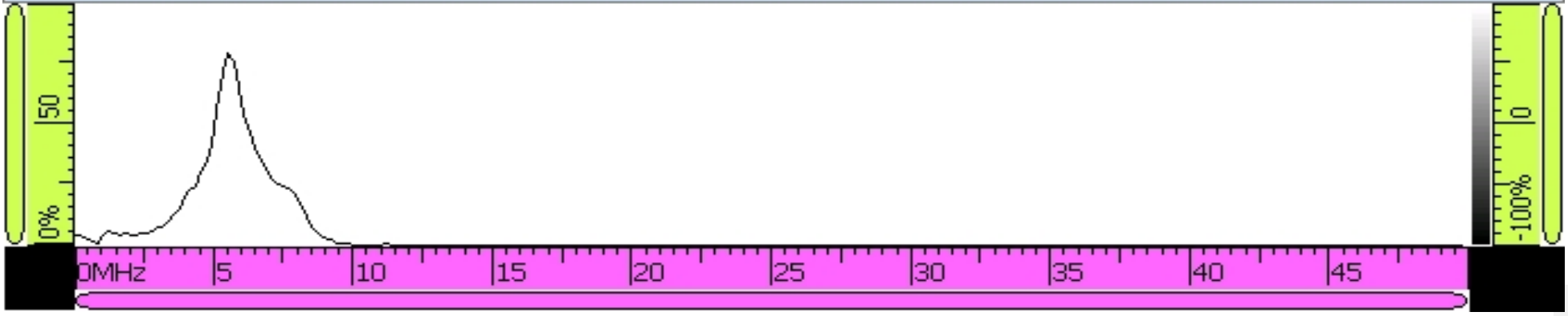


gate threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.47 MHz
-6 dB	4.69 MHz	6.64 MHz	5.66 MHz	1.95 MHz	34.48 %		
-20 dB	3.13 MHz	8.59 MHz	5.86 MHz	5.47 MHz	93.33 %		



Mode: **Pulse-Echo**
 material 0.5" thk steel
 "Save Image" as: File0027.jpg
 "Report Preview" as: File0027.htm
 Excel tab: 17

7.5 MHz

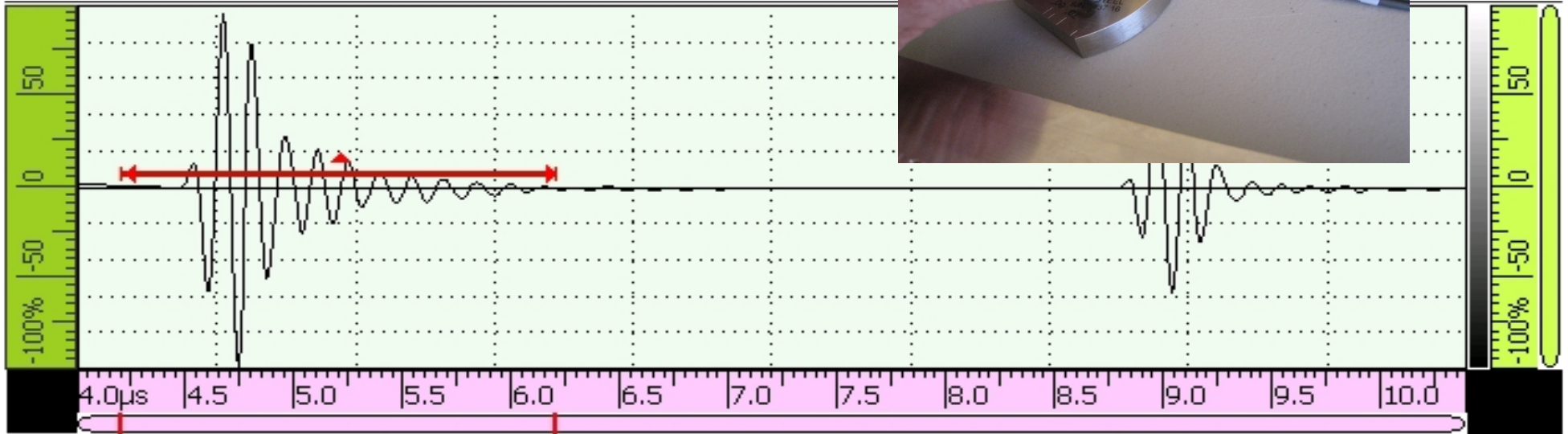
set-up photo:

S/N:
022W3N

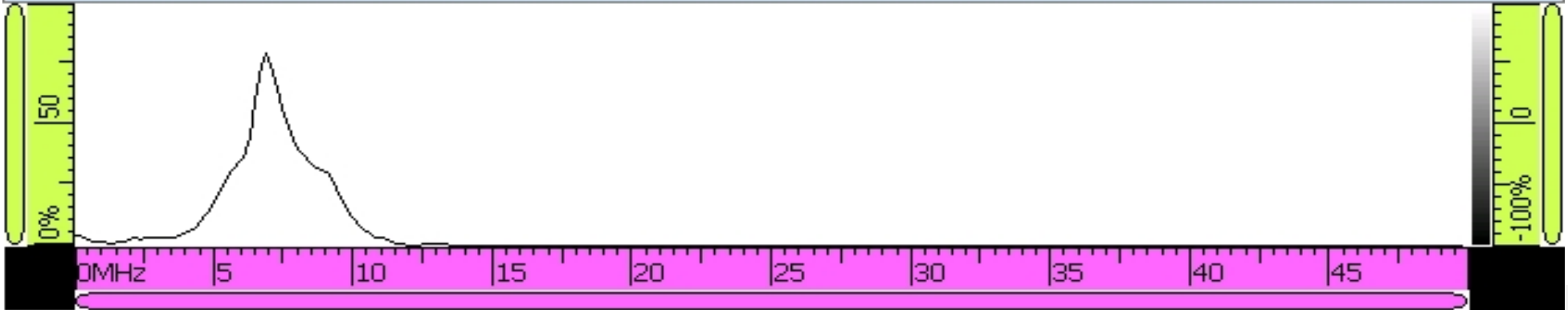


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	6.84 MHz
-6 dB	6.05 MHz	8.20 MHz	7.13 MHz	2.15 MHz	30.14 %		
-20 dB	4.30 MHz	10.35 MHz	7.32 MHz	6.05 MHz	82.67 %		



Mode: **Pulse-Echo**
 material 0.5" thk steel
 "Save Image" as: File0028.jpg
 "Report Preview" as: File0028.htm
 Excel tab: 18

**10.0
MHz**

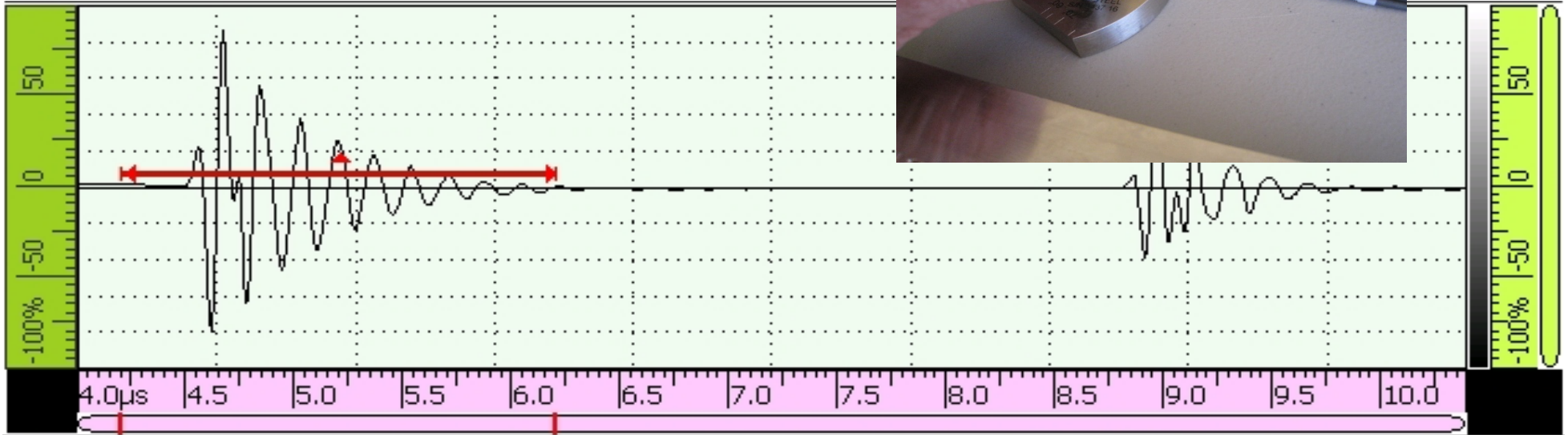
set-up photo:

S/N:
021JJR

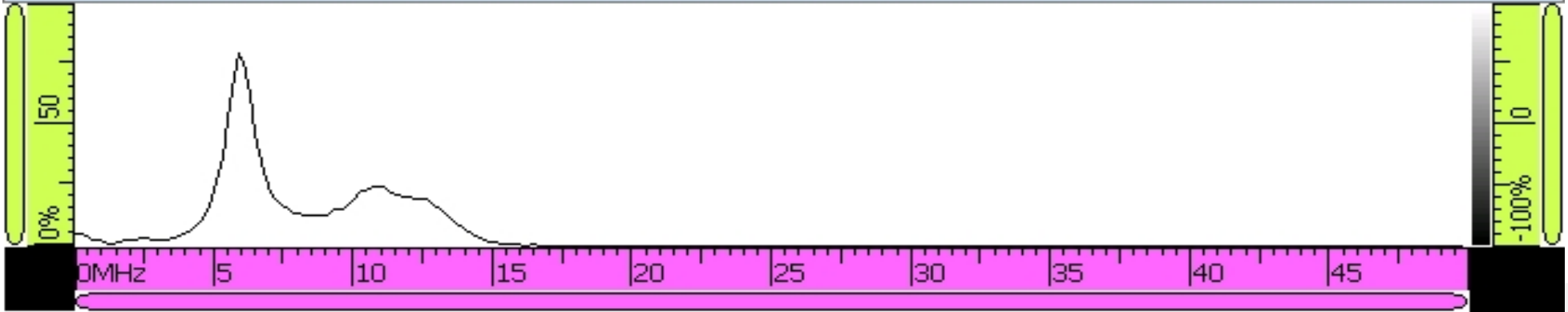


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.86 MHz
-6 dB	5.27 MHz	6.64 MHz	5.96 MHz	1.37 MHz	22.95 %		
-20 dB	4.10 MHz	13.87 MHz	8.98 MHz	9.77 MHz	108.70 %		



Mode: **Pulse-Echo**
 material 0.5" thk steel
 "Save Image" as: File0029.jpg
 "Report Preview" as: File0029.htm
 Excel tab: 19

**10.0
 MHz**

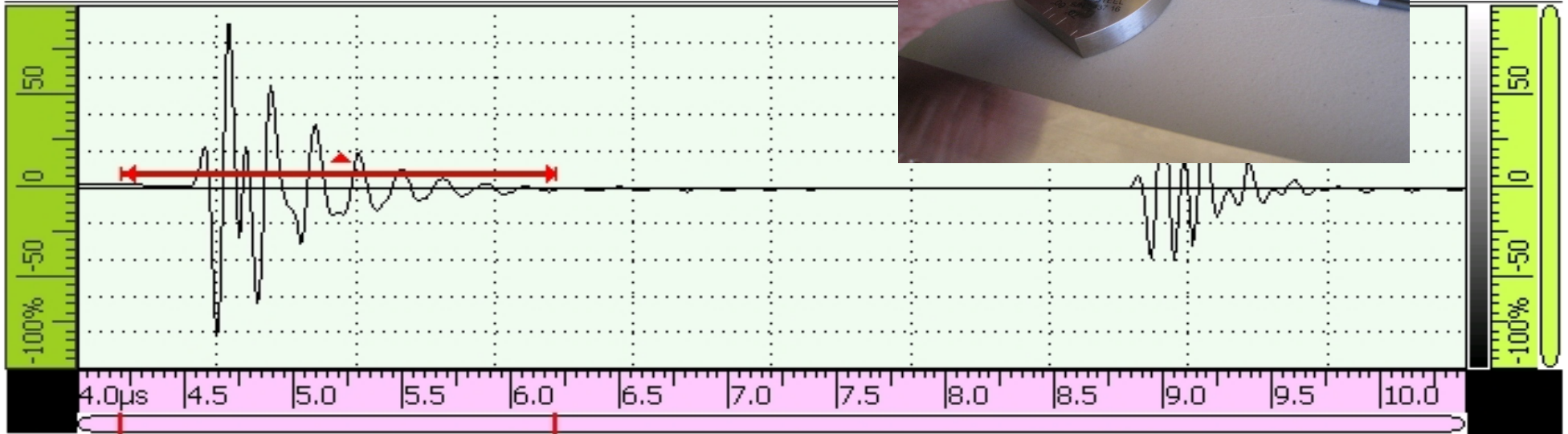
set-up photo:

S/N:
 021TTM

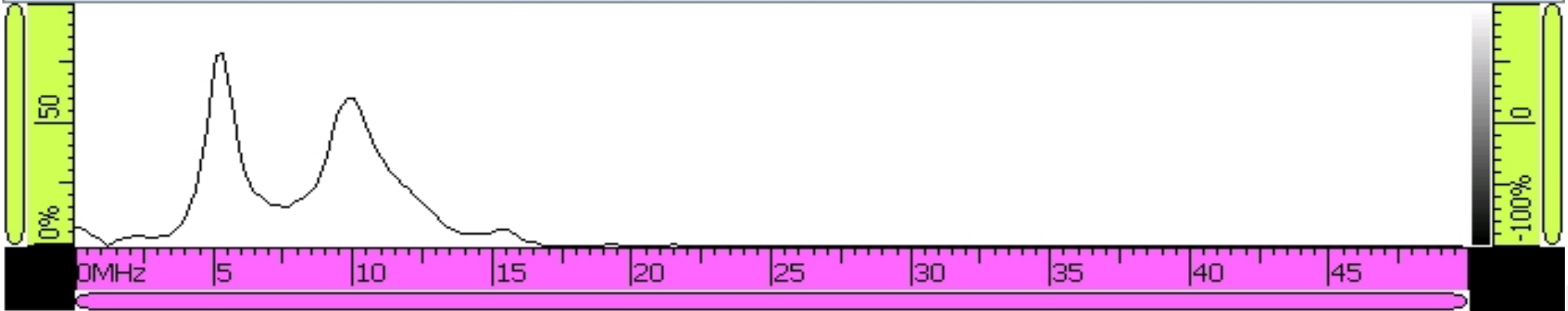


gate
 threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.27 MHz
-6 dB	4.49 MHz	6.05 MHz	5.27 MHz	1.56 MHz	29.63 %		
-20 dB	3.52 MHz	13.48 MHz	8.50 MHz	9.96 MHz	117.24 %		



Mode: **Pulse-Echo**
 material 0.5" thk steel
 "Save Image" as: File0031.jpg
 "Report Preview" as: File0031.htm
 Excel tab: 21

**15.0
MHz**

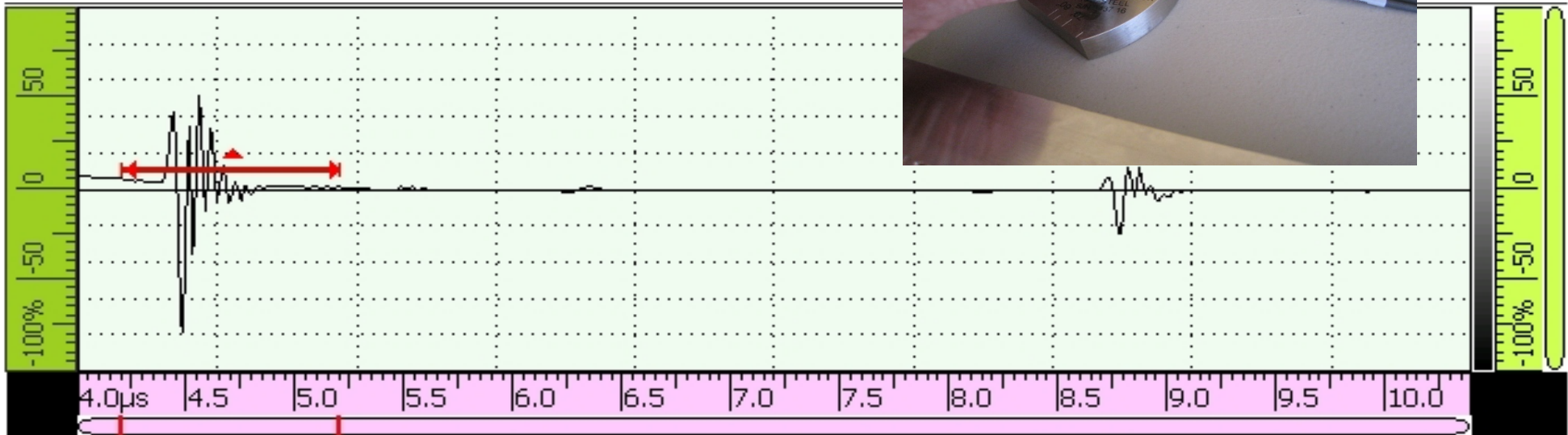
set-up photo:

S/N:
024PY4

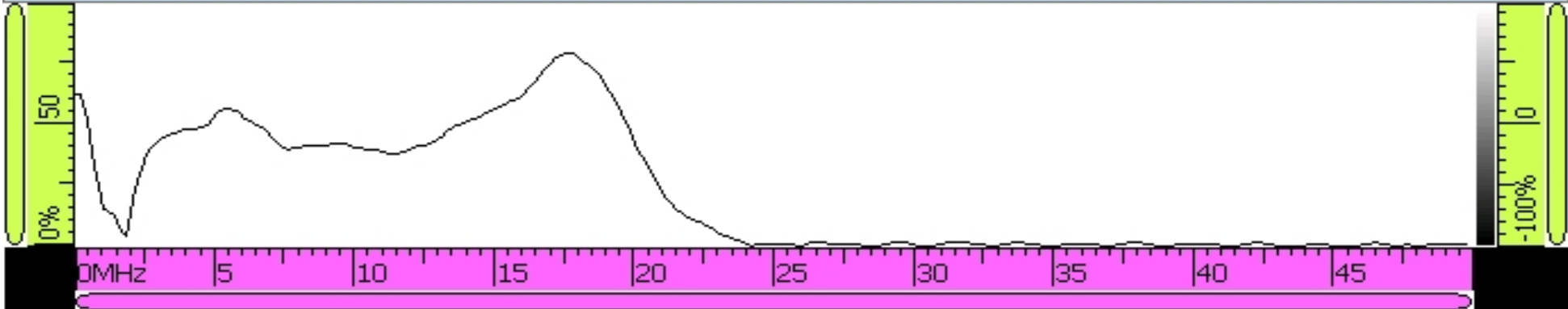


gate
threshold:

7%



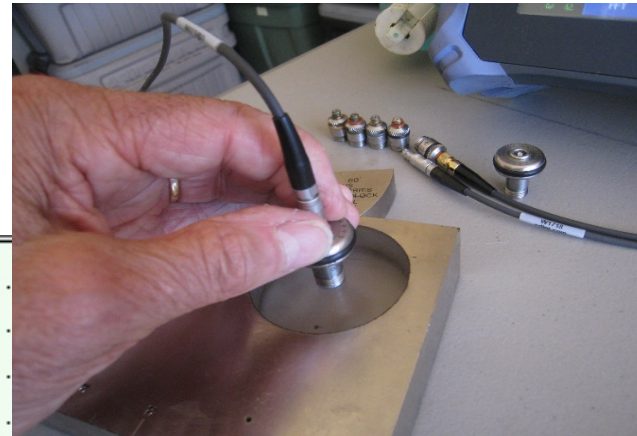
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:
-6 dB	11.91 MHz	20.31 MHz	16.11 MHz	8.40 MHz	52.12 %	17.58 MHz
-20 dB	1.76 MHz	22.66 MHz	12.21 MHz	20.90 MHz	171.20 %	



Mode: **Pulse-Echo**
 material 0.92" thk PERSPEX
 "Save Image" as: File0032.jpg
 "Report Preview" as: File0032.htm
 Excel tab: 22

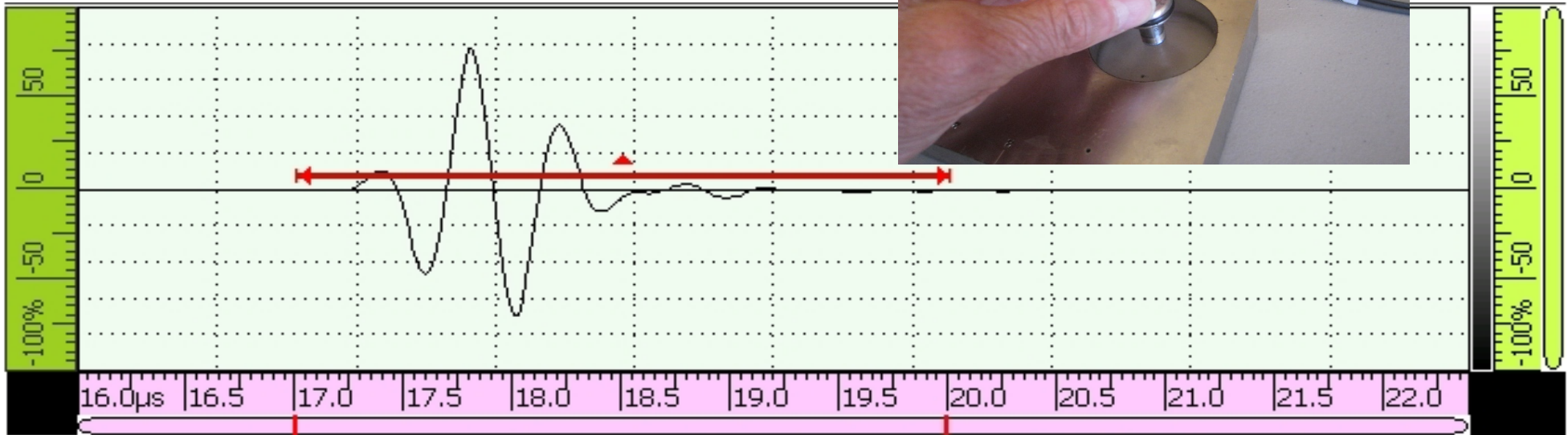
**2.25
 MHz**

set-up photo:

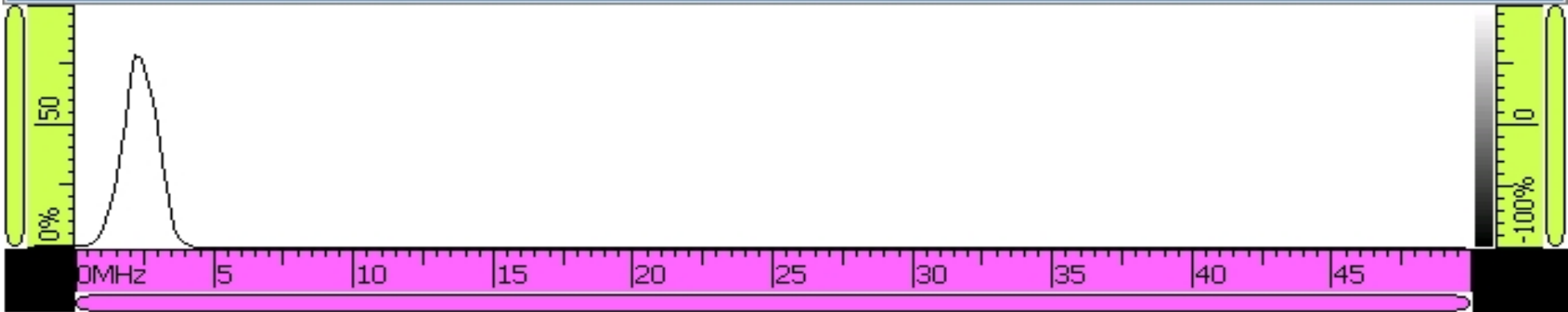


gate
 threshold:

7%



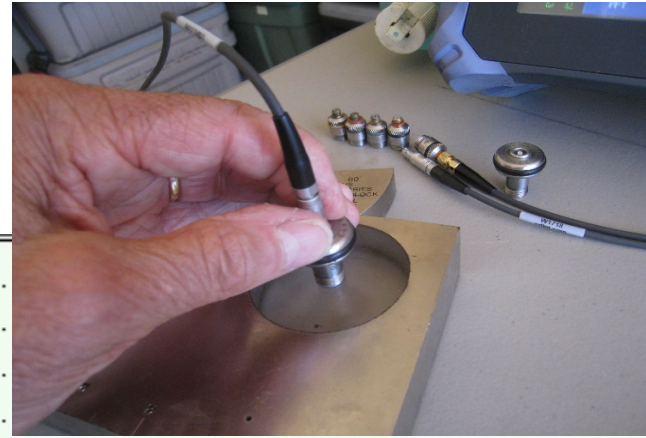
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.15 MHz
-6 dB	1.56 MHz	3.13 MHz	2.34 MHz	1.56 MHz	66.67 %		
-20 dB	0.98 MHz	3.71 MHz	2.34 MHz	2.73 MHz	116.67 %		



Mode: **Pulse-Echo**
 material 0.92" thk PERSPEX
 "Save Image" as: File0033.jpg
 "Report Preview" as: File0033.htm
 Excel tab: 23

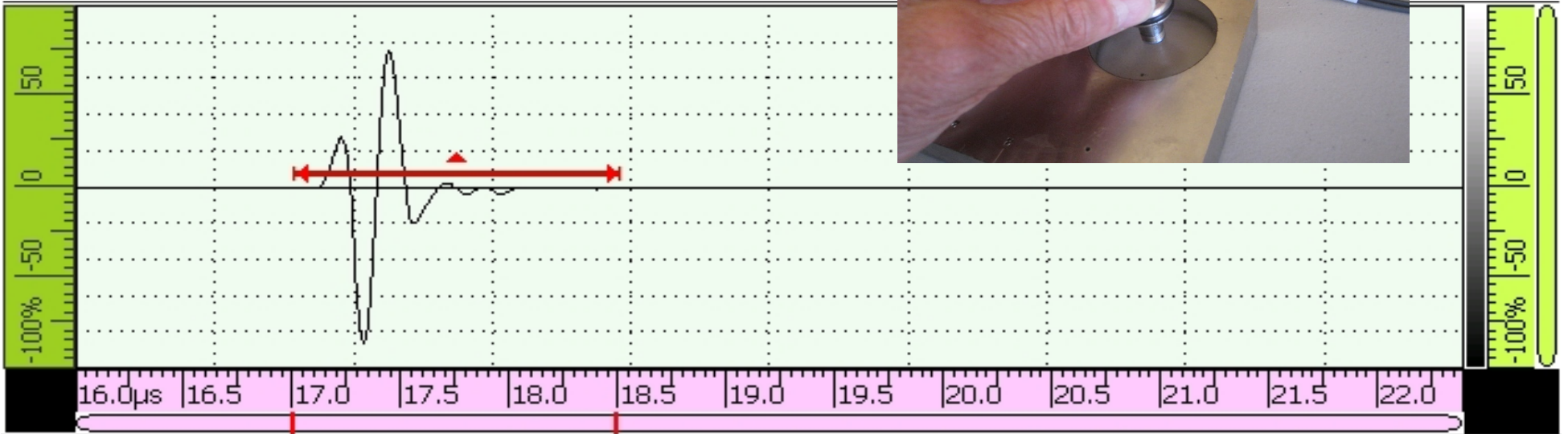
5.0 MHz

set-up photo:

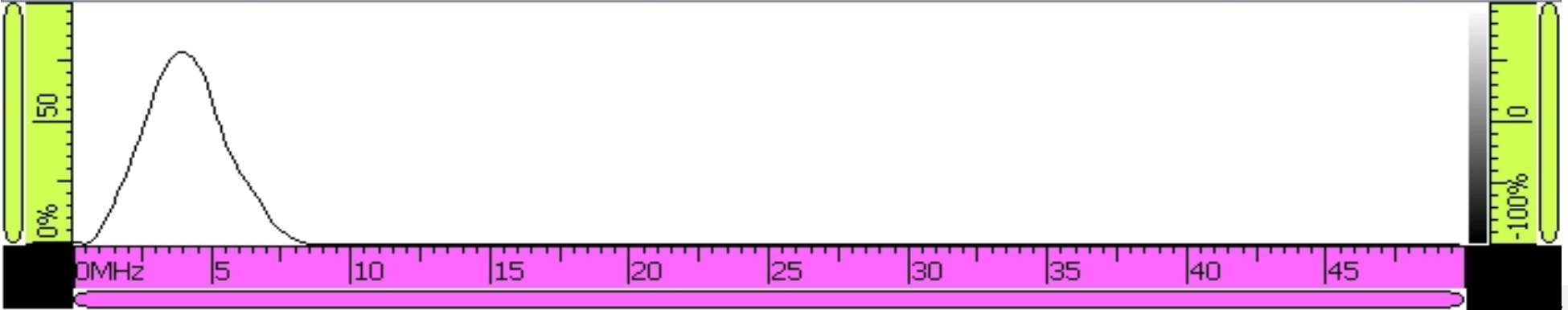


gate threshold:

7%



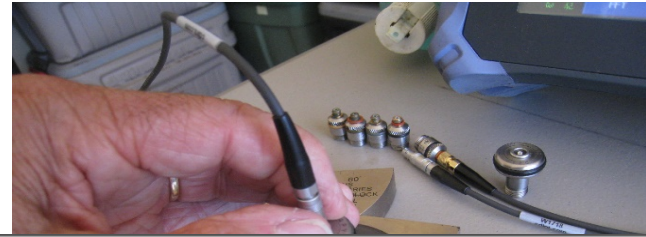
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.91 MHz
-6 dB	2.15 MHz	5.66 MHz	3.91 MHz	3.52 MHz	90.00 %		
-20 dB	0.98 MHz	7.23 MHz	4.10 MHz	6.25 MHz	152.38 %		



Mode: **Pulse-Echo**
 material 0.92" thk PERSPEX
 "Save Image" as: File0034.jpg
 "Report Preview" as: File0034.htm
 Excel tab: 24

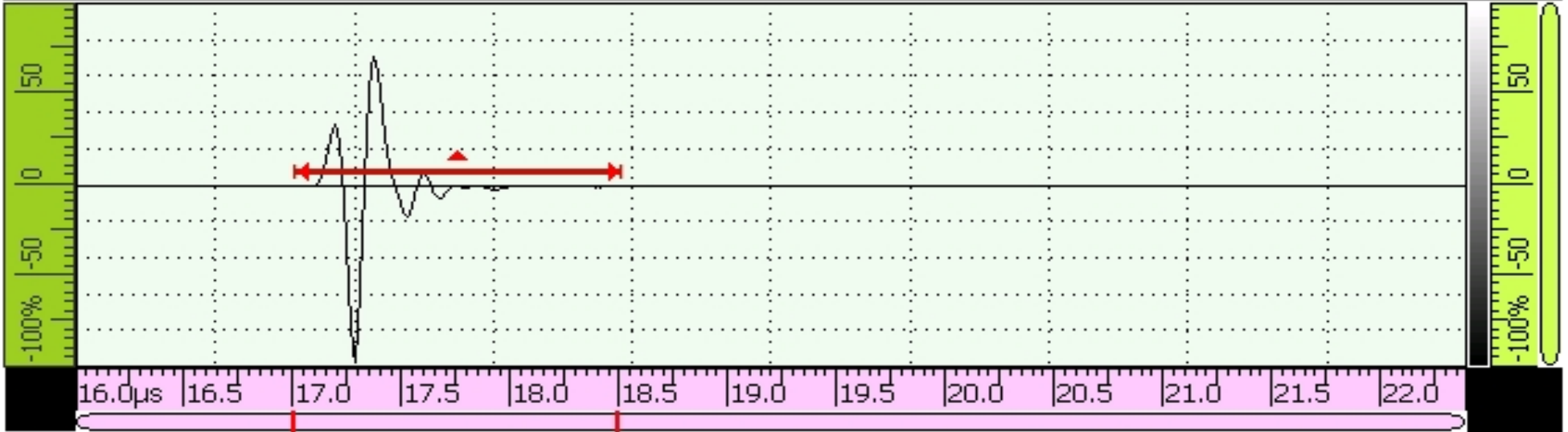
7.5 MHz

set-up photo:

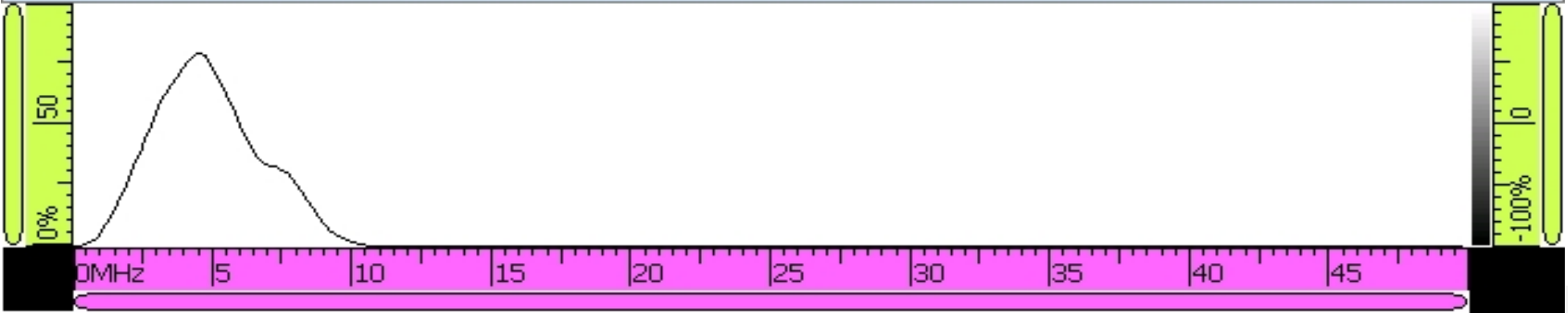


gate threshold:

7%



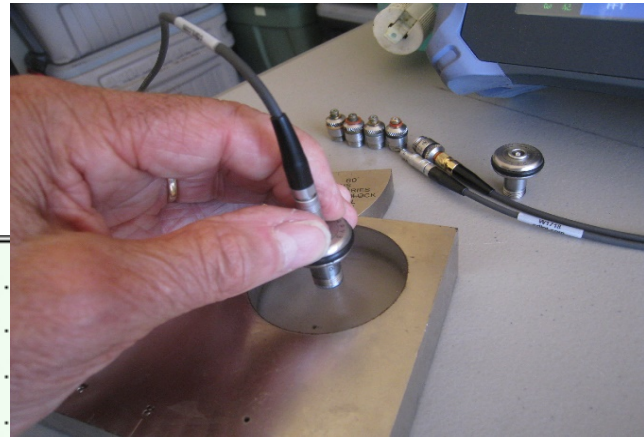
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.49 MHz
-6 dB	2.34 MHz	6.45 MHz	4.39 MHz	4.10 MHz	93.33 %		
-20 dB	0.98 MHz	9.18 MHz	5.08 MHz	8.20 MHz	161.54 %		



Mode: **Pulse-Echo**
 material 0.92" thk PERSPEX
 "Save Image" as: File0035.jpg
 "Report Preview" as: File0035.htm
 Excel tab: 25

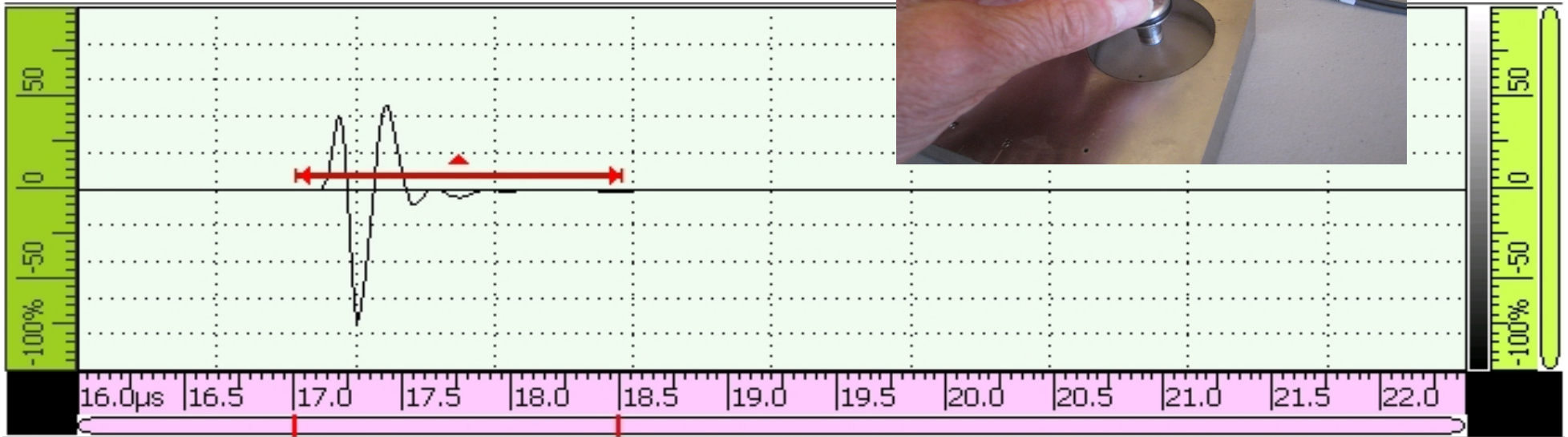
**10.0
 MHz**

set-up photo:

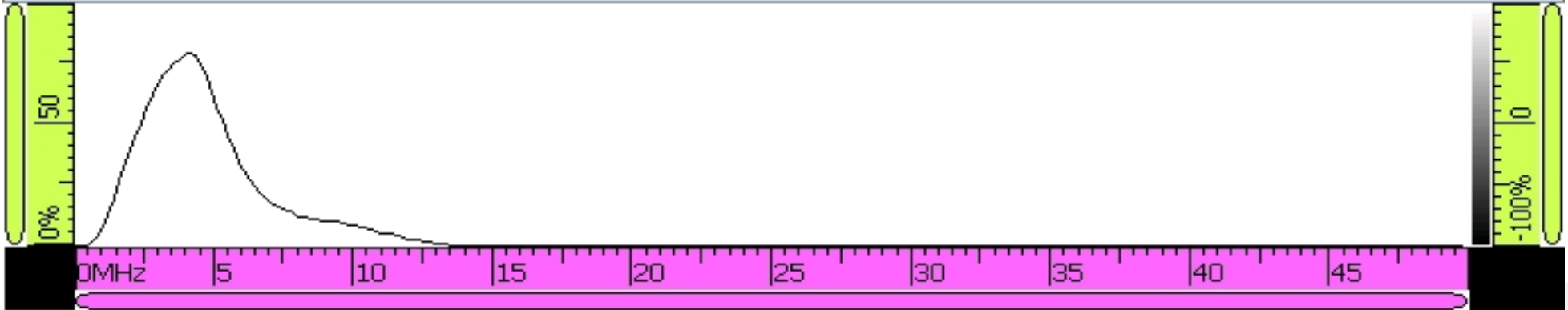


gate
 threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.10 MHz
-6 dB	1.95 MHz	5.66 MHz	3.81 MHz	3.71 MHz	97.44 %		
-20 dB	0.98 MHz	10.16 MHz	5.57 MHz	9.18 MHz	164.91 %		



Mode: **Pulse-Echo**
 material 0.92" thk PERSPEX
 "Save Image" as: File0036.jpg
 "Report Preview" as: File0036.htm
 Excel tab: 26

**10.0
MHz**

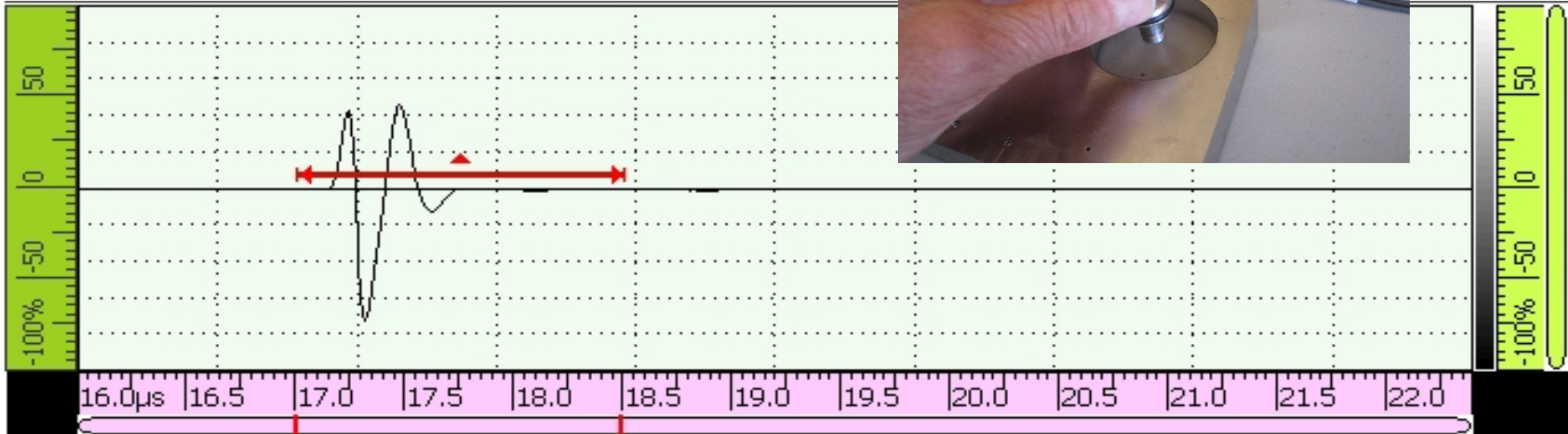
set-up photo:

S/N:
021TTM

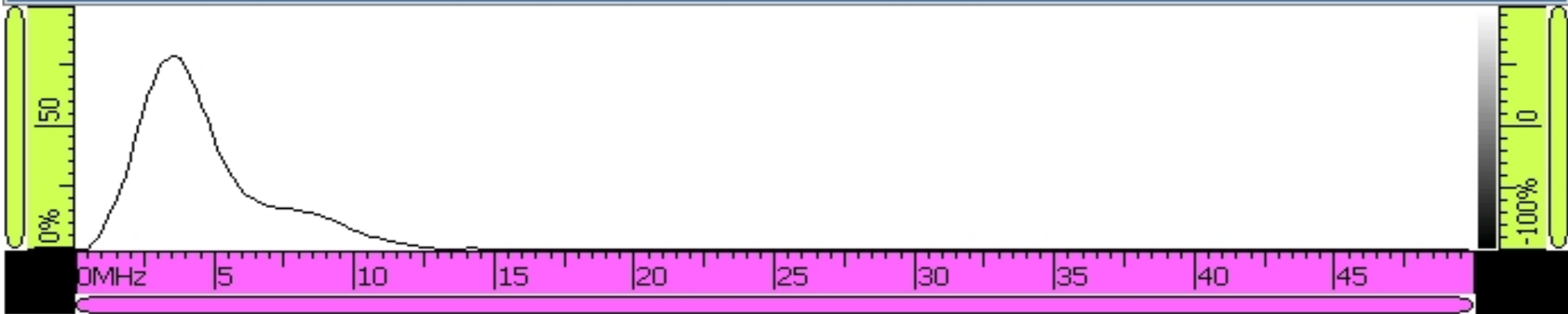


gate
threshold:

7%



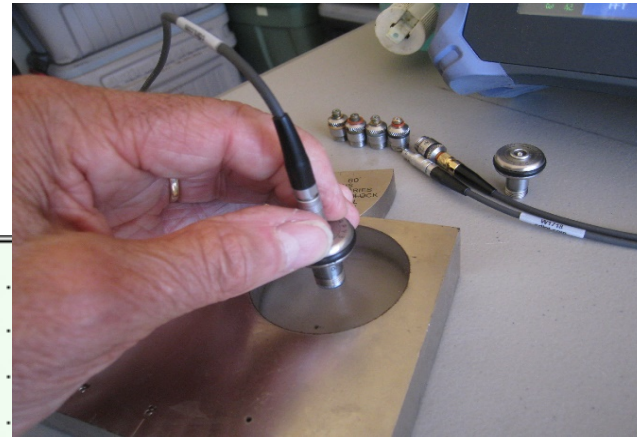
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.52 MHz
-6 dB	1.95 MHz	5.27 MHz	3.61 MHz	3.32 MHz	91.89 %		
-20 dB	0.78 MHz	9.96 MHz	5.37 MHz	9.18 MHz	170.91 %		



Mode: **Pulse-Echo**
 material 0.92" thk PERSPEX
 "Save Image" as: File0037.jpg
 "Report Preview" as: File0037.htm
 Excel tab: 27

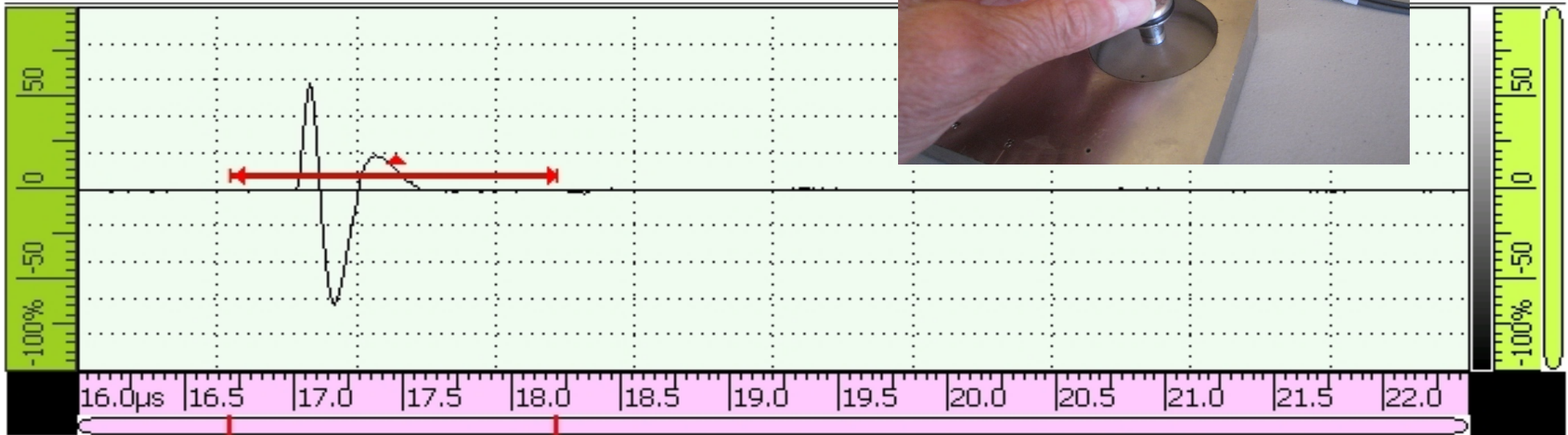
**15.0
 MHz**

set-up photo:

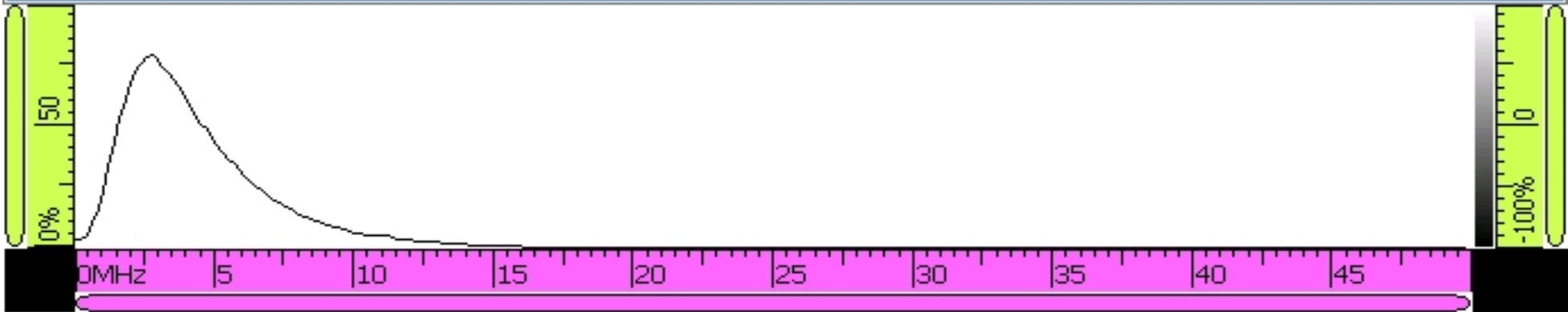


gate
 threshold:

7%



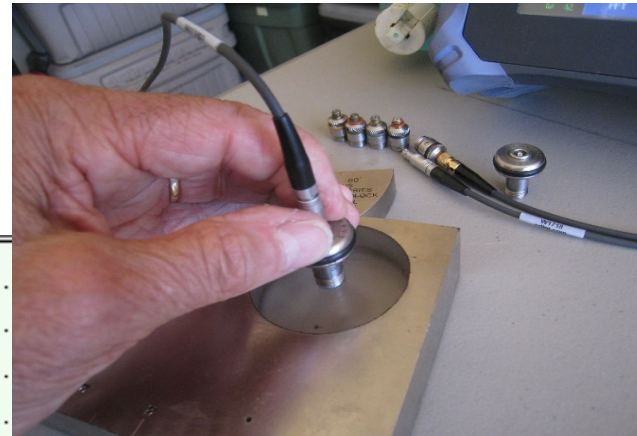
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:
-6 dB	1.17 MHz	5.27 MHz	3.22 MHz	4.10 MHz	127.27 %	2.73 MHz
-20 dB	0.39 MHz	9.57 MHz	4.98 MHz	9.18 MHz	184.31 %	



Mode: **Pulse-Echo**
 material 0.92" thk PERSPEX
 "Save Image" as: File0038.jpg
 "Report Preview" as: File0038.htm
 Excel tab: 28

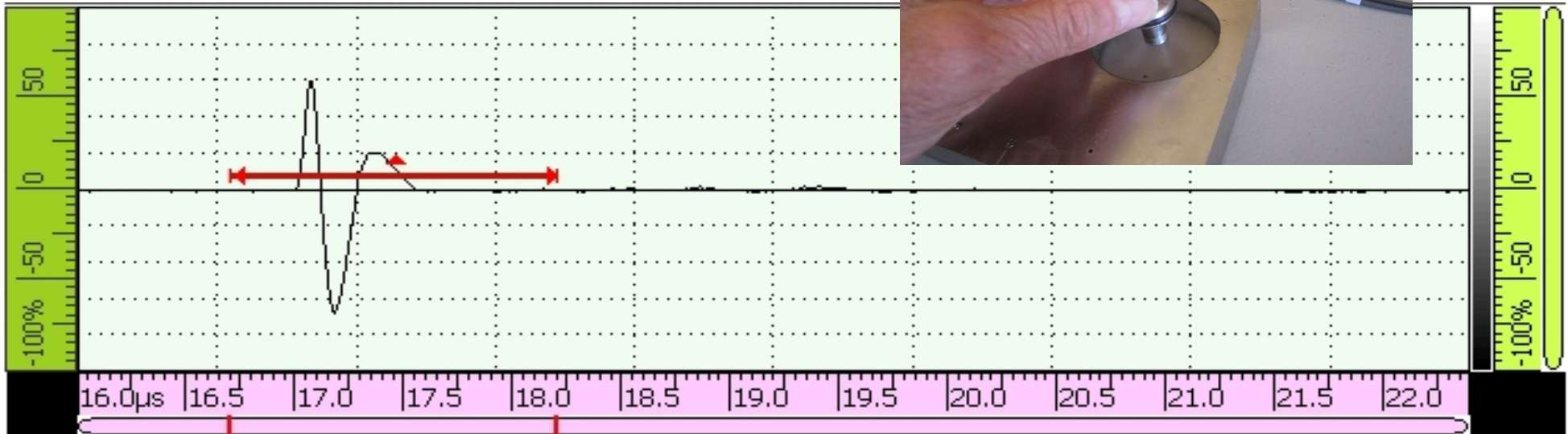
**15.0
 MHz**

set-up photo:

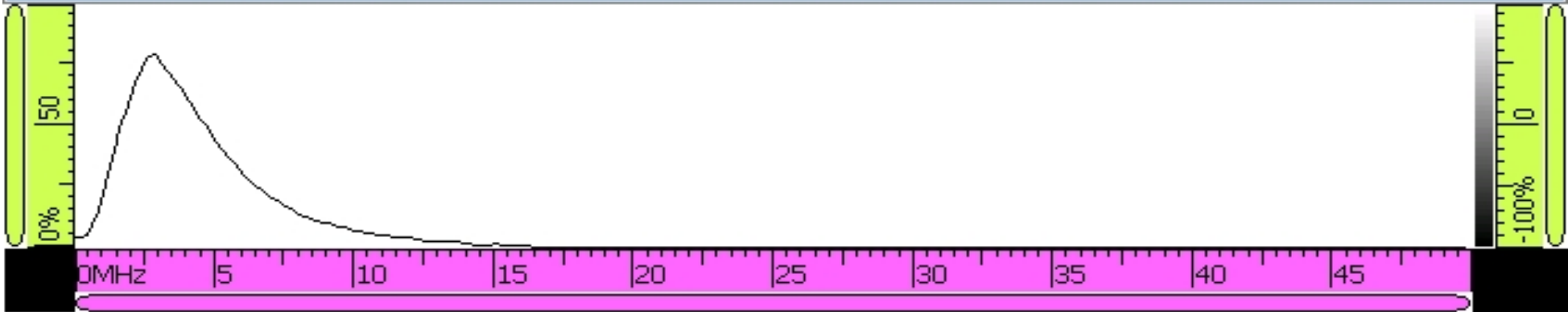


gate
 threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.73 MHz
-6 dB	1.37 MHz	5.47 MHz	3.42 MHz	4.10 MHz	120.00 %		
-20 dB	0.39 MHz	9.77 MHz	5.08 MHz	9.38 MHz	184.62 %		



Mode: **Pulse-Echo**
 material 0.5" thk REXOLITE WEDGE
 "Save Image" as: File0039.jpg
 "Report Preview" as: File0039.htm
 Excel tab: 29

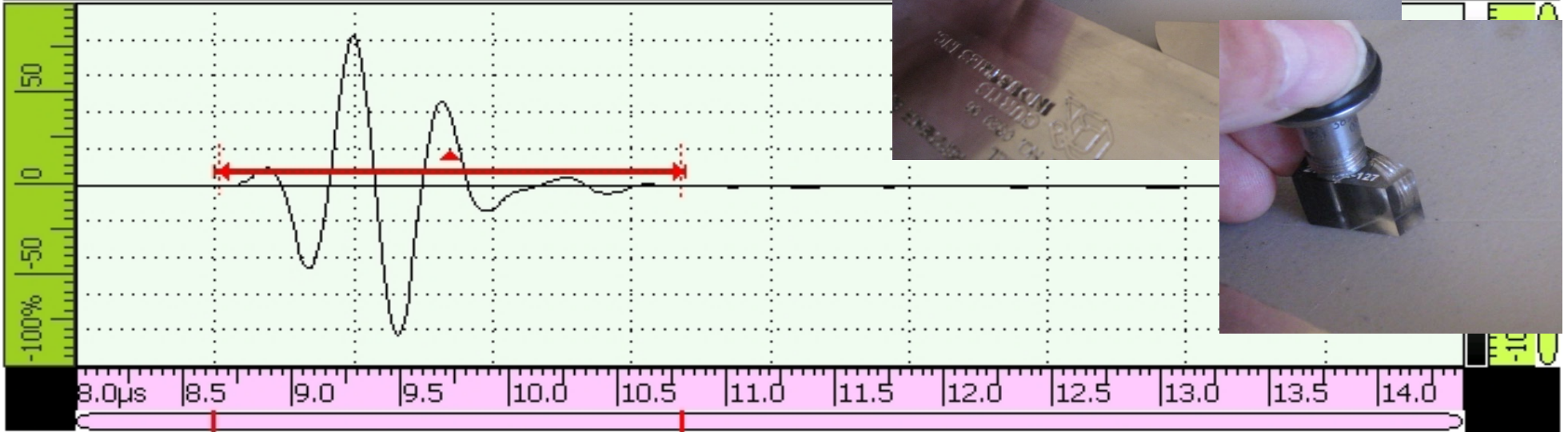
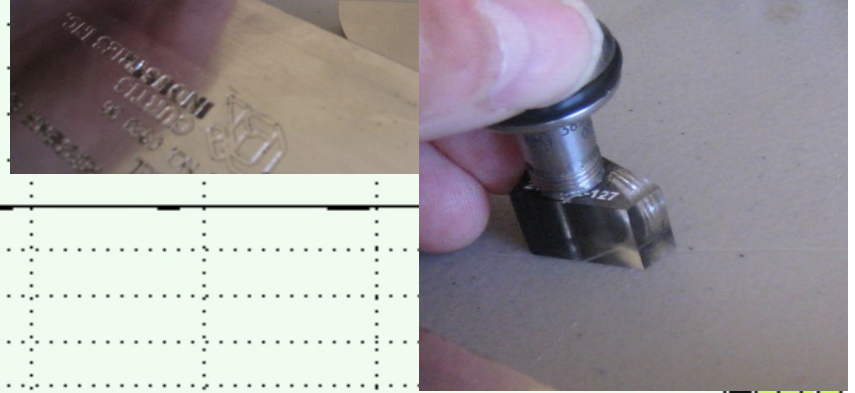
**2.25
MHz**

set-up photo:

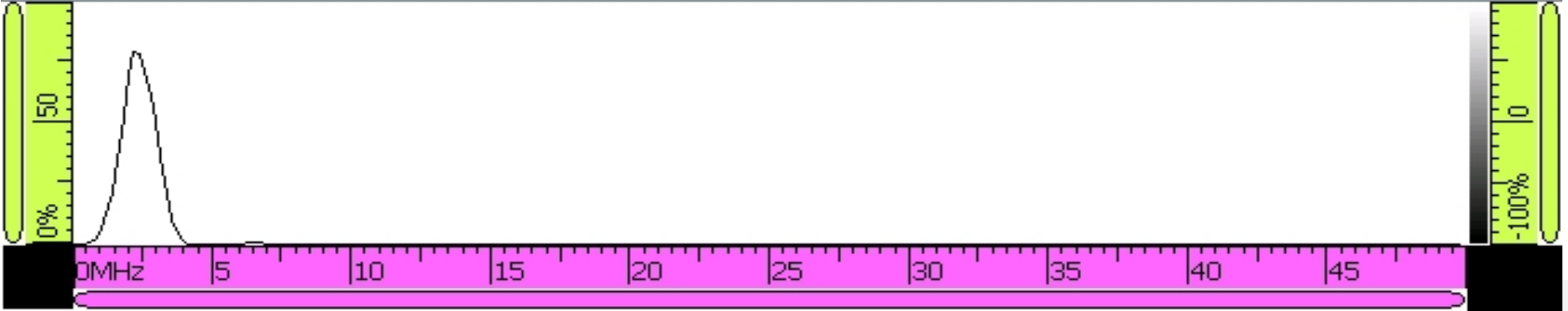
S/N:
011DHW

gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.15 MHz
-6 dB	1.56 MHz	3.13 MHz	2.34 MHz	1.56 MHz	66.67 %		
-20 dB	0.98 MHz	3.71 MHz	2.34 MHz	2.73 MHz	116.67 %		



Mode: **Pulse-Echo**
 material 0.5" thk REXOLITE WEDGE
 "Save Image" as: File0040.jpg
 "Report Preview" as: File0040.htm
 Excel tab: 30

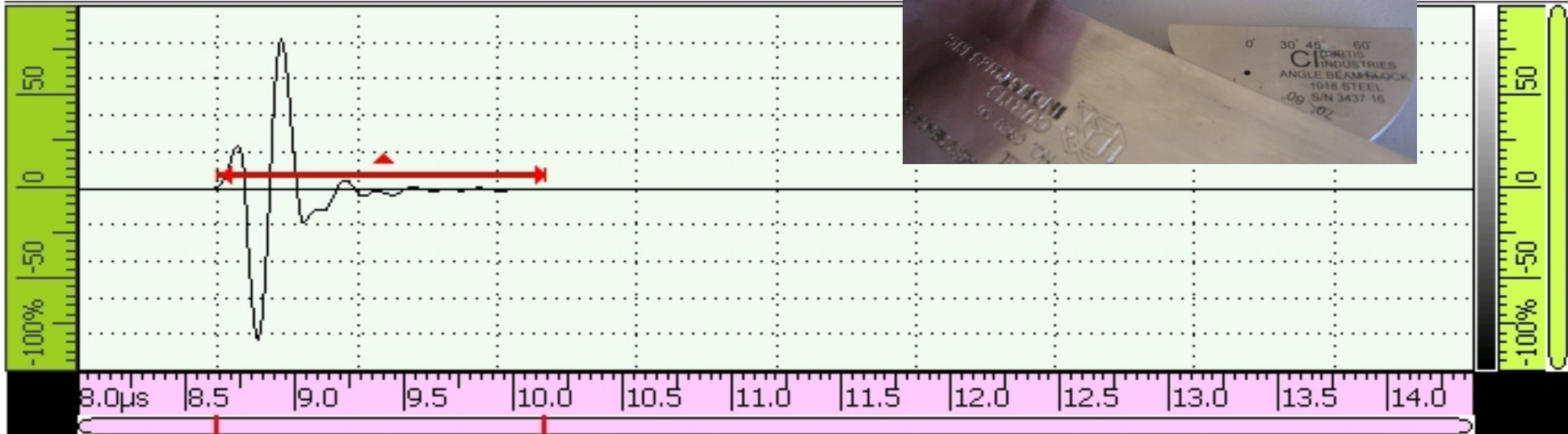
5.0 MHz

set-up photo:

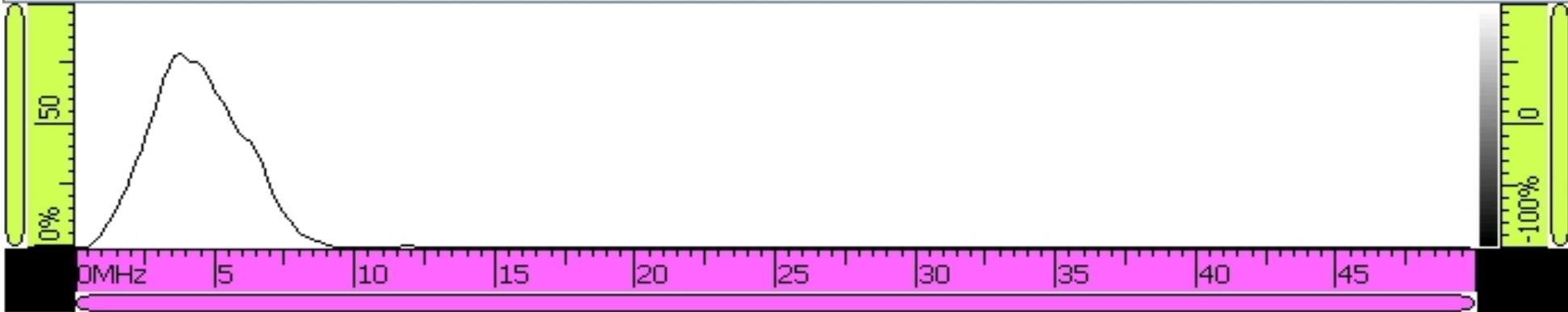


gate threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.71 MHz
-6 dB	2.15 MHz	6.45 MHz	4.30 MHz	4.30 MHz	100.00 %		
-20 dB	0.98 MHz	8.01 MHz	4.49 MHz	7.03 MHz	156.52 %		



Mode: **Pulse-Echo**
 material 0.5" thk REXOLITE WEDGE
 "Save Image" as: File0041.jpg
 "Report Preview" as: File0041.htm
 Excel tab: 31

7.5 MHz

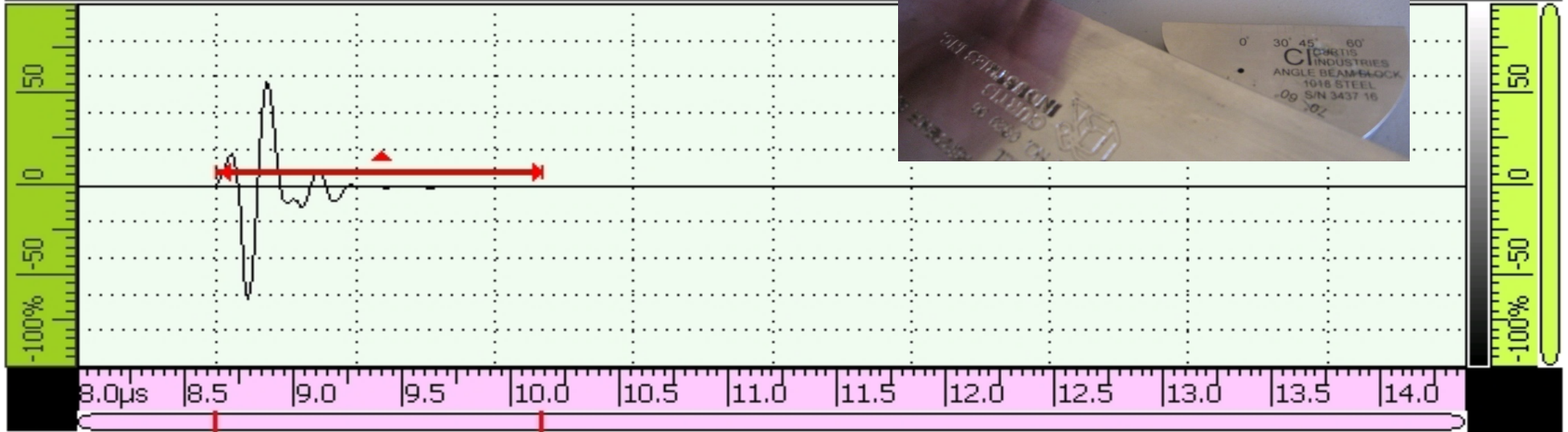
set-up photo:

S/N:
022W3N

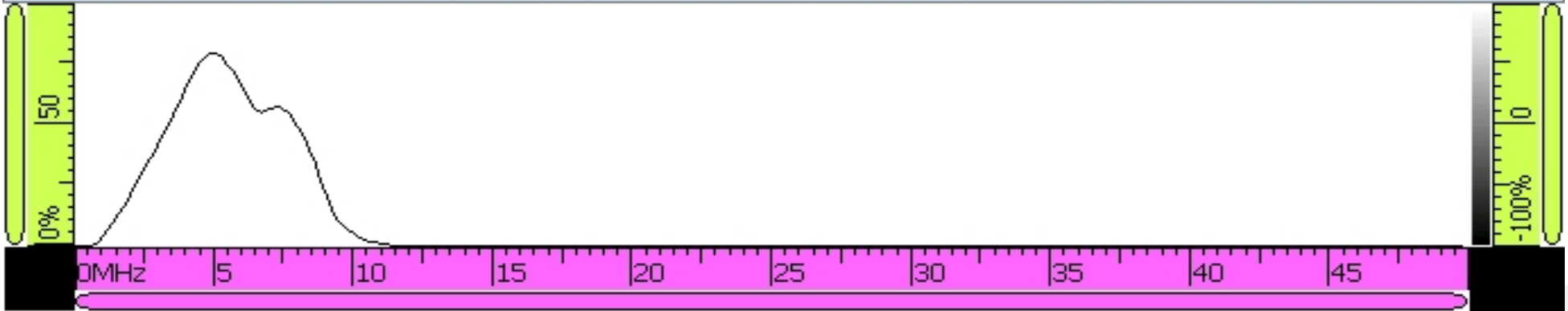


gate
threshold:

7%



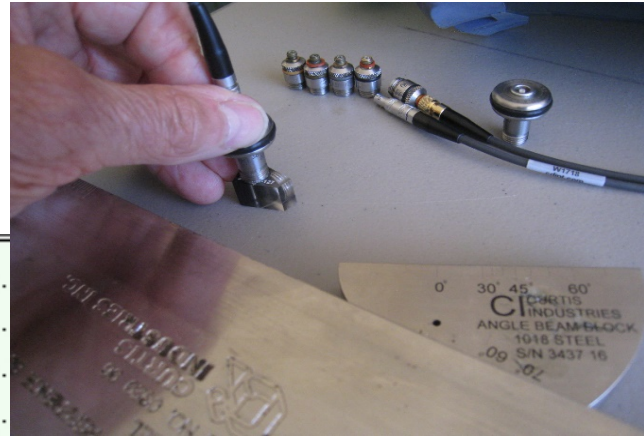
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.88 MHz
-6 dB	2.73 MHz	8.40 MHz	5.57 MHz	5.66 MHz	101.75 %		
-20 dB	1.17 MHz	9.77 MHz	5.47 MHz	8.59 MHz	157.14 %		



Mode: **Pulse-Echo**
 material 0.5" thk REXOLITE WEDGE
 "Save Image" as: File0042.jpg
 "Report Preview" as: File0042.htm
 Excel tab: 32

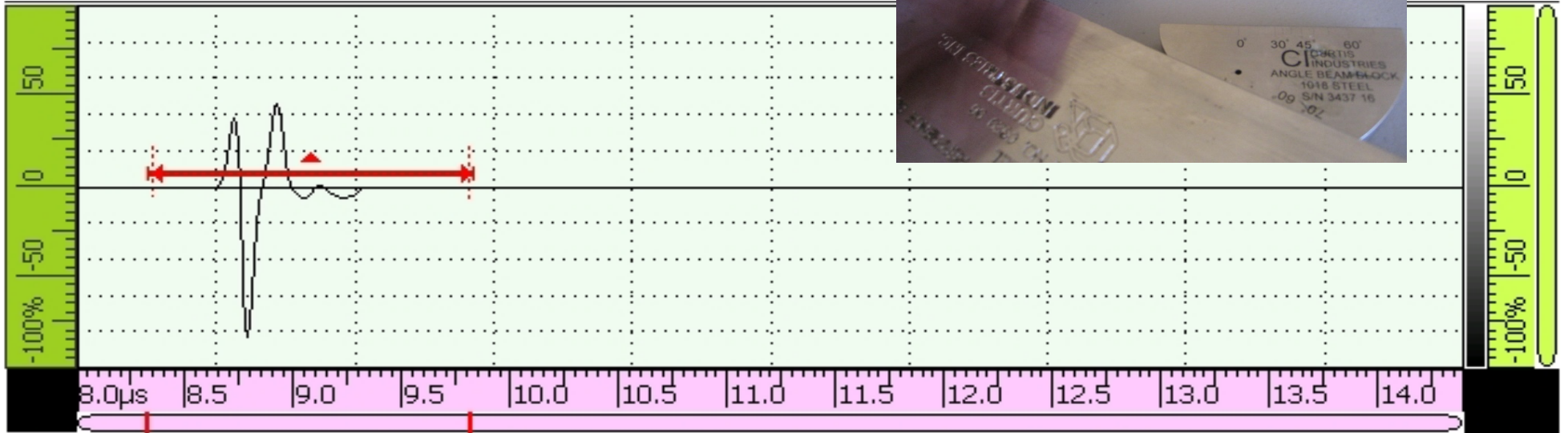
**10.0
MHz**

set-up photo:

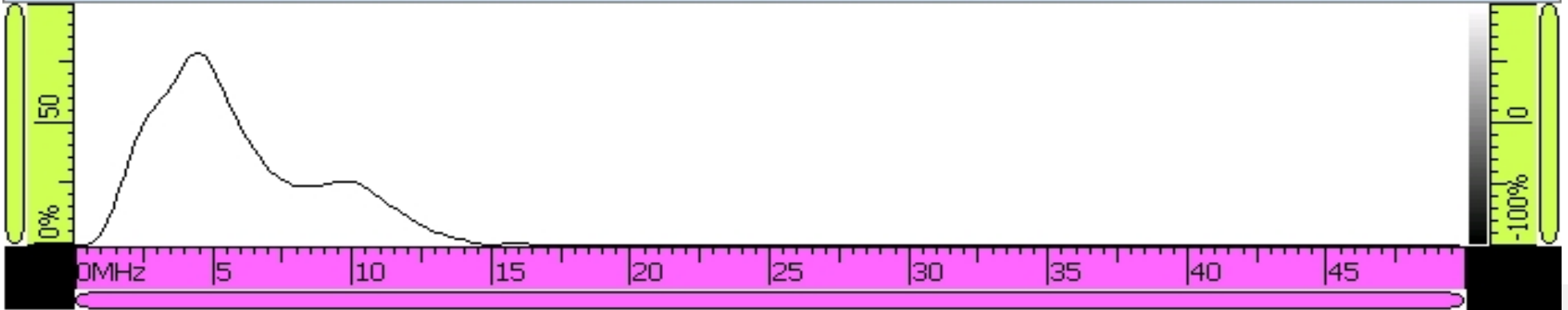


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.30 MHz
-6 dB	1.95 MHz	6.45 MHz	4.20 MHz	4.49 MHz	106.98 %		
-20 dB	0.98 MHz	12.50 MHz	6.74 MHz	11.52 MHz	171.01 %		

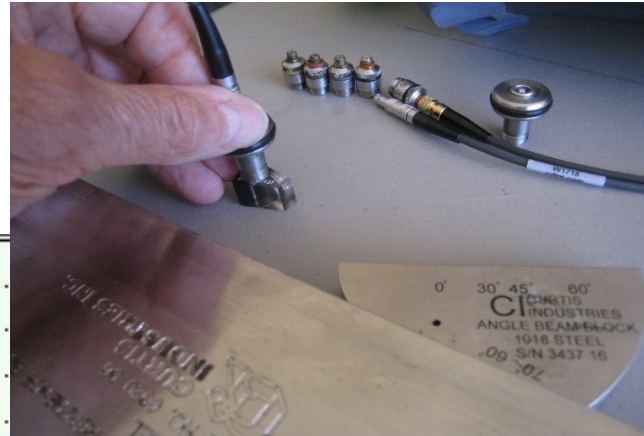


Mode: **Pulse-Echo**
 material 0.5" thk REXOLITE WEDGE
 "Save Image" as: File0043.jpg
 "Report Preview" as: File0043.htm
 Excel tab: 33

**10.0
MHz**

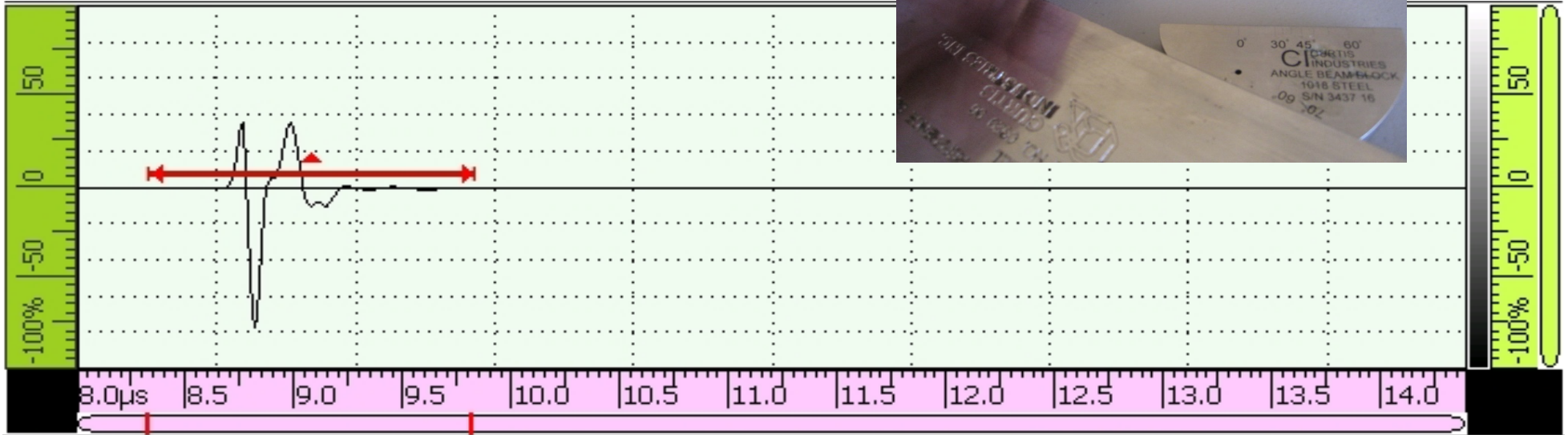
set-up photo:

S/N:
021TTM

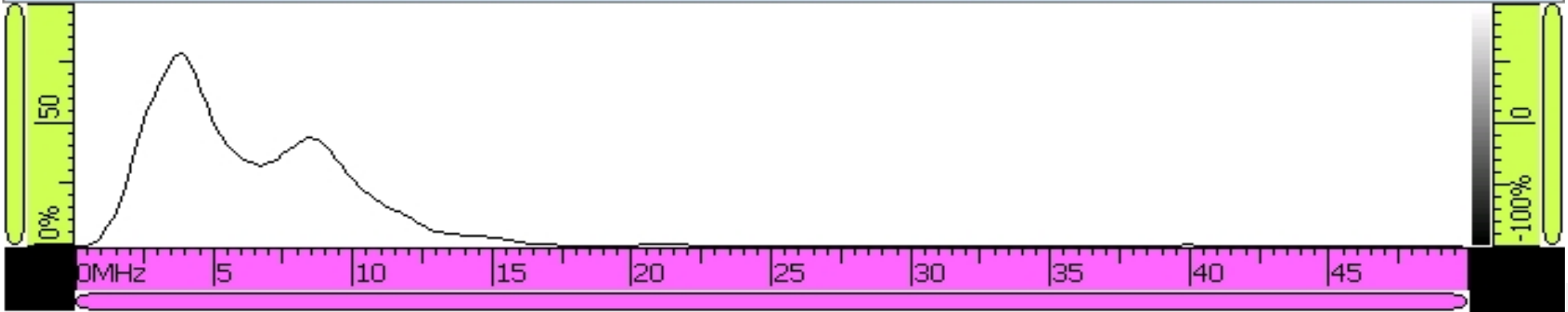


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.71 MHz
-6 dB	1.95 MHz	5.66 MHz	3.81 MHz	3.71 MHz	97.44 %		
-20 dB	0.98 MHz	12.70 MHz	6.84 MHz	11.72 MHz	171.43 %		

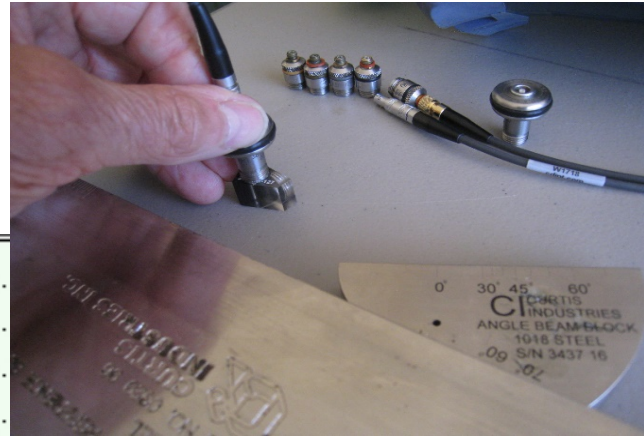


Mode: **Pulse-Echo**
 material 0.5" thk REXOLITE WEDGE
 "Save Image" as: File0044.jpg
 "Report Preview" as: File0044.htm
 Excel tab: 34

**15.0
MHz**

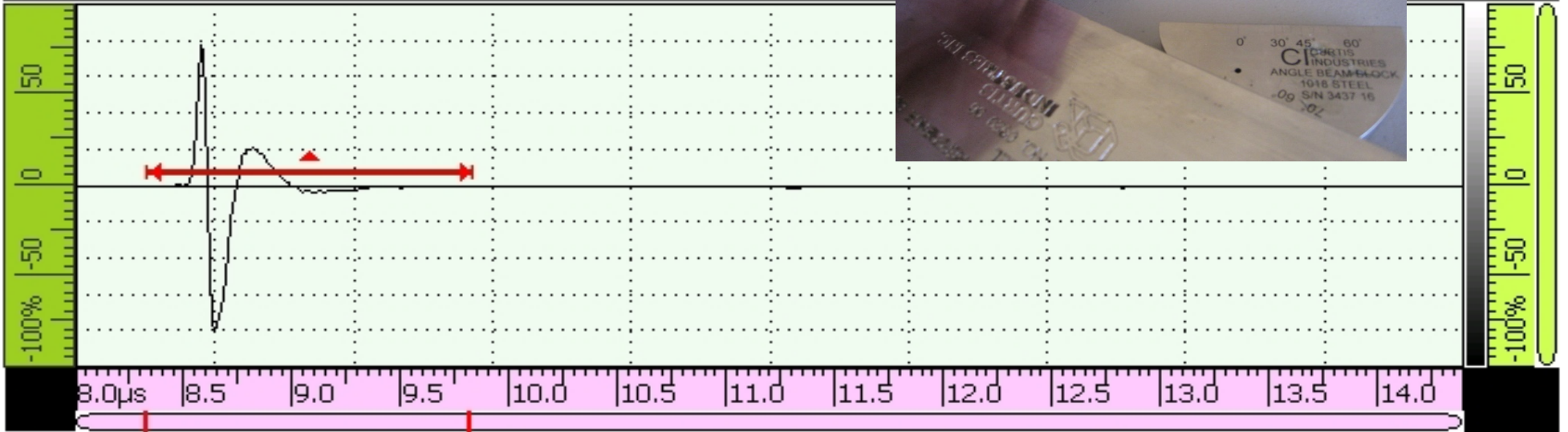
set-up photo:

S/N:
024PY3

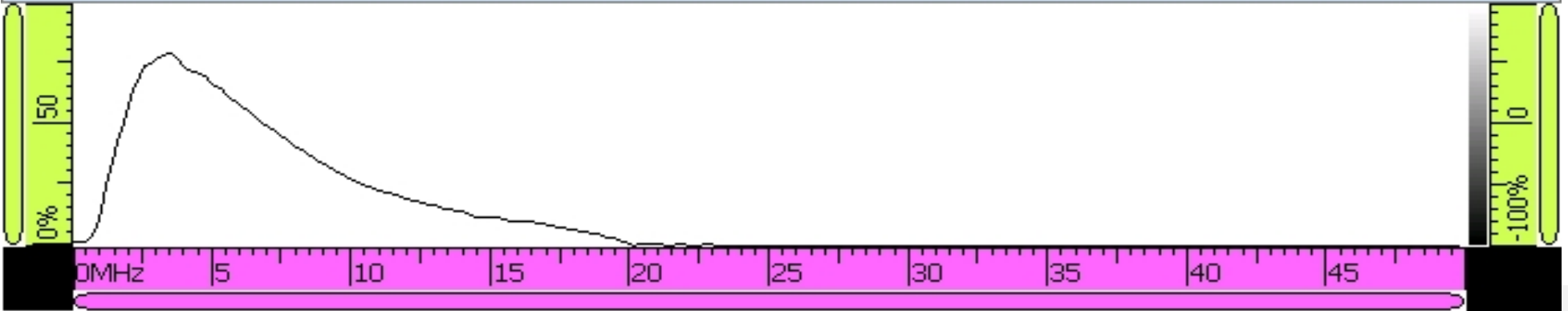


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.32 MHz
-6 dB	1.37 MHz	8.20 MHz	4.79 MHz	6.84 MHz	142.86 %		
-20 dB	0.78 MHz	17.38 MHz	9.08 MHz	16.60 MHz	182.80 %		



Mode: **Pulse-Echo**
 material 0.5" thk REXOLITE WEDGE
 "Save Image" as: File0045.jpg
 "Report Preview" as: File0045.htm
 Excel tab: 35

**15.0
MHz**

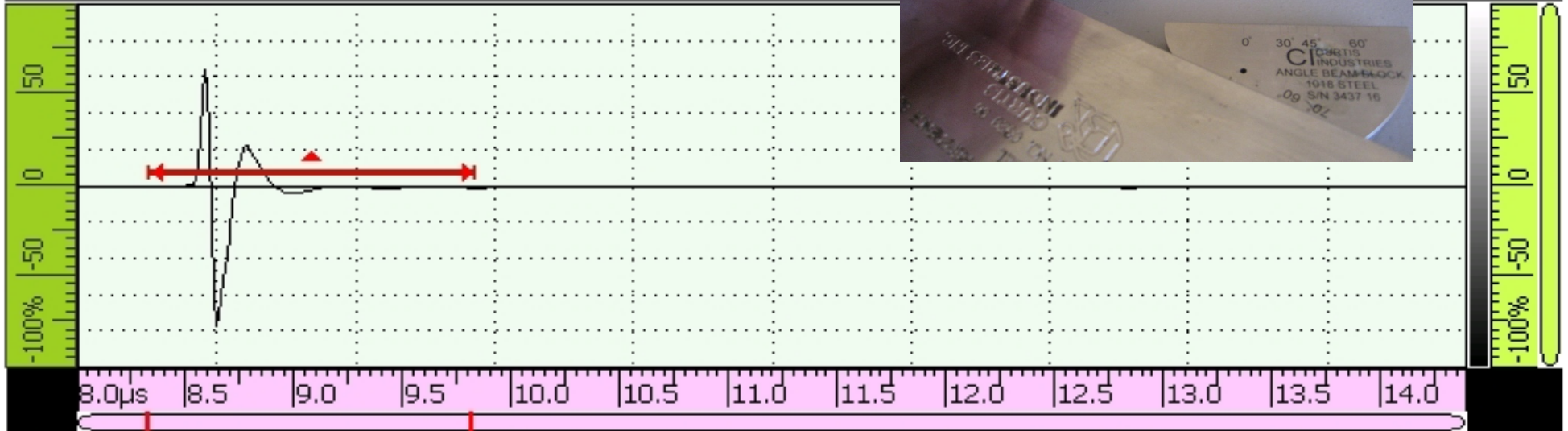
set-up photo:

S/N:
024PY4

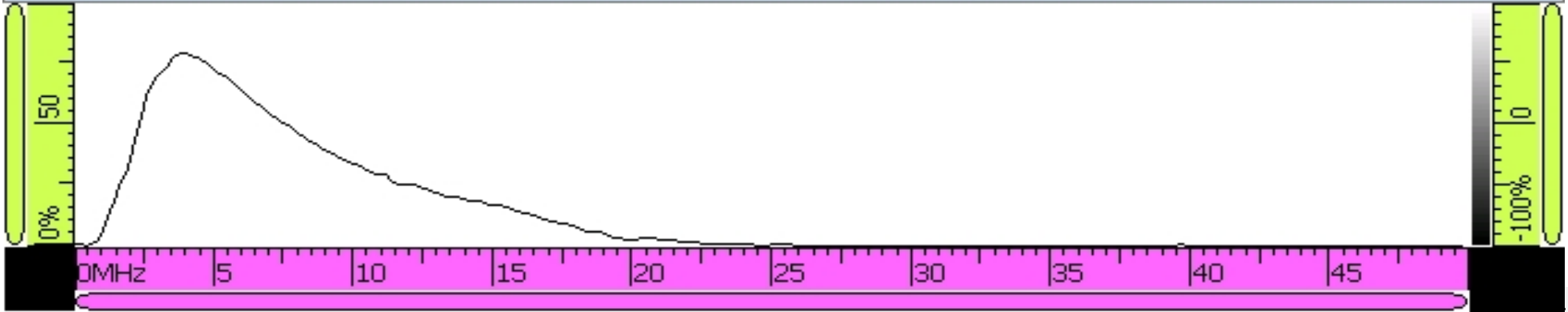


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.71 MHz
-6 dB	1.95 MHz	8.98 MHz	5.47 MHz	7.03 MHz	128.57 %		
-20 dB	0.98 MHz	17.97 MHz	9.47 MHz	16.99 MHz	179.38 %		



Mode: **Pulse-Echo**
 material 0.5" thk PLEXIGLAS WEDGE
 "Save Image" as: File0046.jpg
 "Report Preview" as: File0046.htm
 Excel tab: 36

**2.25
MHz**

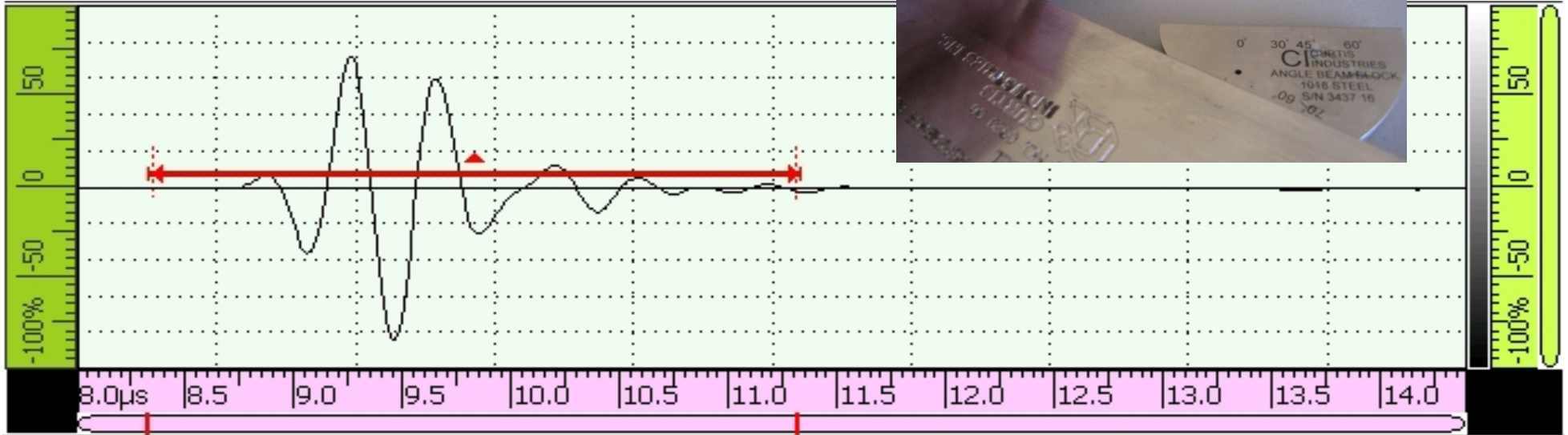
set-up photo:

S/N:
011DHW

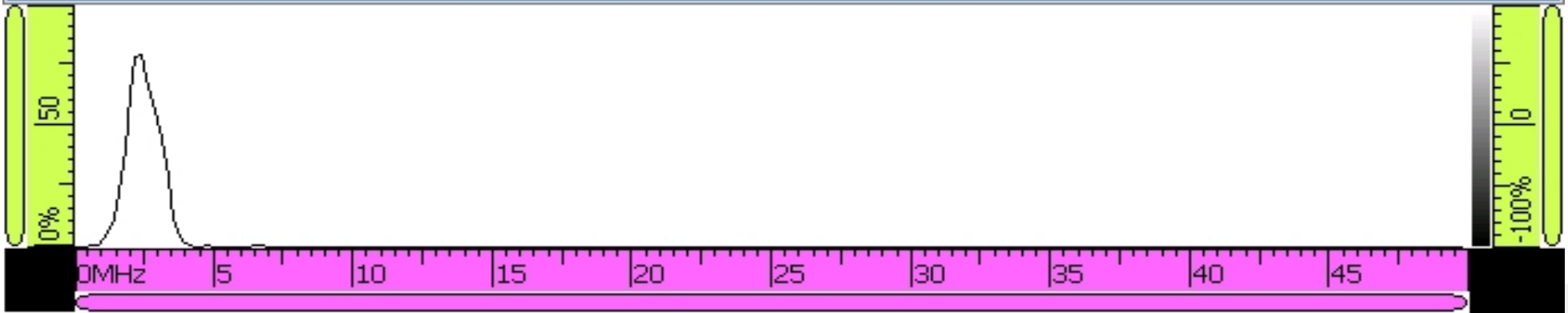


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.34 MHz
-6 dB	1.56 MHz	3.32 MHz	2.44 MHz	1.76 MHz	72.00 %		
-20 dB	1.17 MHz	3.71 MHz	2.44 MHz	2.54 MHz	104.00 %		



Mode: **Pulse-Echo**
 material 0.5" thk PLEXIGLAS WEDGE
 "Save Image" as: File0047.jpg
 "Report Preview" as: File0047.htm
 Excel tab: 37

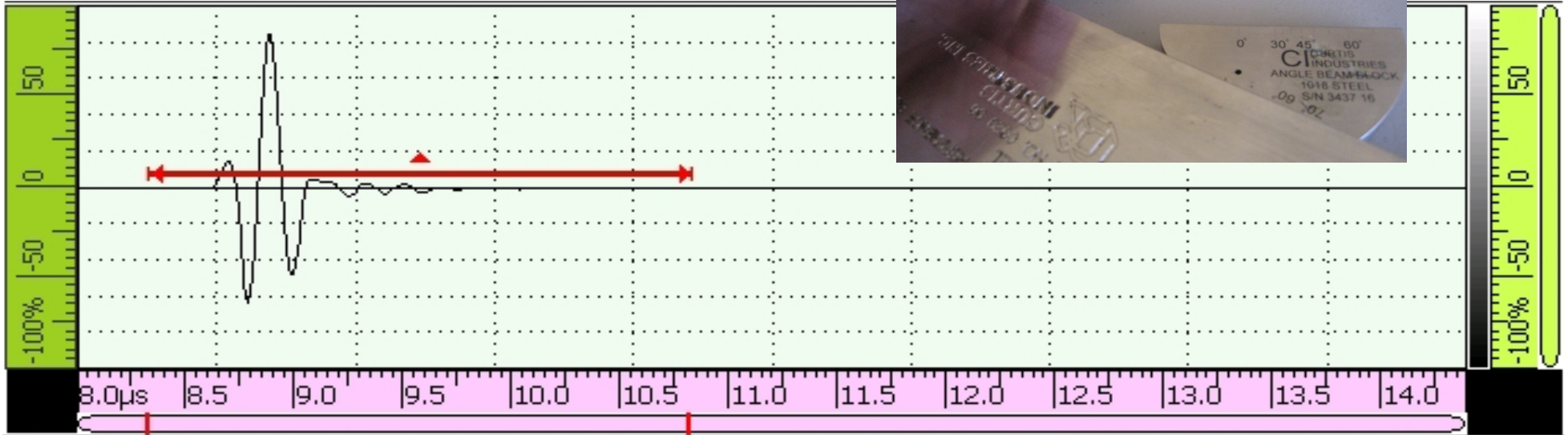
5.0 MHz

set-up photo:

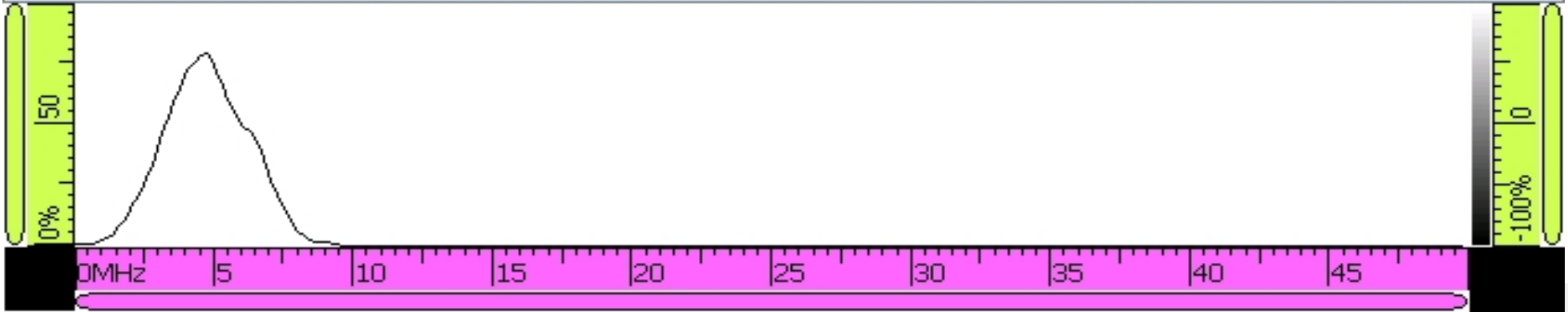


gate threshold:

7%



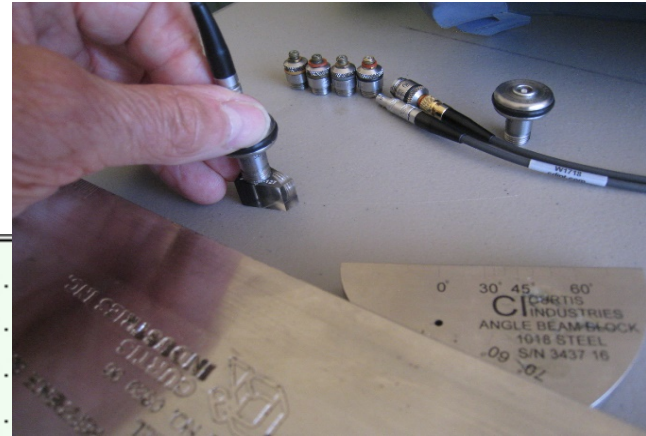
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.69 MHz
-6 dB	2.73 MHz	6.64 MHz	4.69 MHz	3.91 MHz	83.33 %		
-20 dB	1.37 MHz	8.01 MHz	4.69 MHz	6.64 MHz	141.67 %		



Mode: **Pulse-Echo**
 material 0.5" thk PLEXIGLAS WEDGE
 "Save Image" as: File0048.jpg
 "Report Preview" as: File0048.htm
 Excel tab: 38

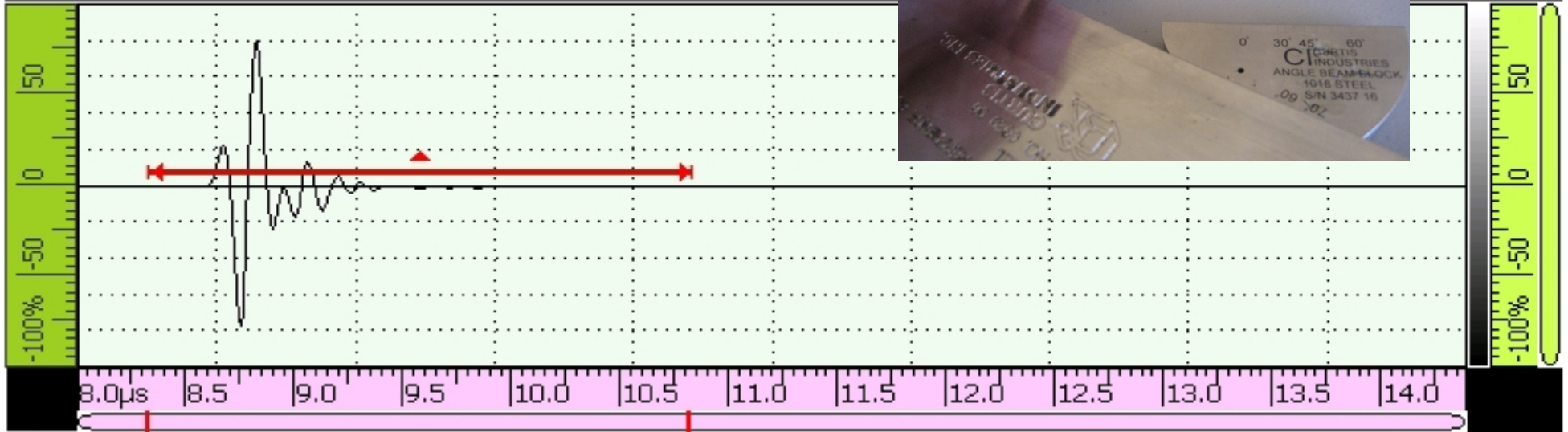
7.5 MHz

set-up photo:

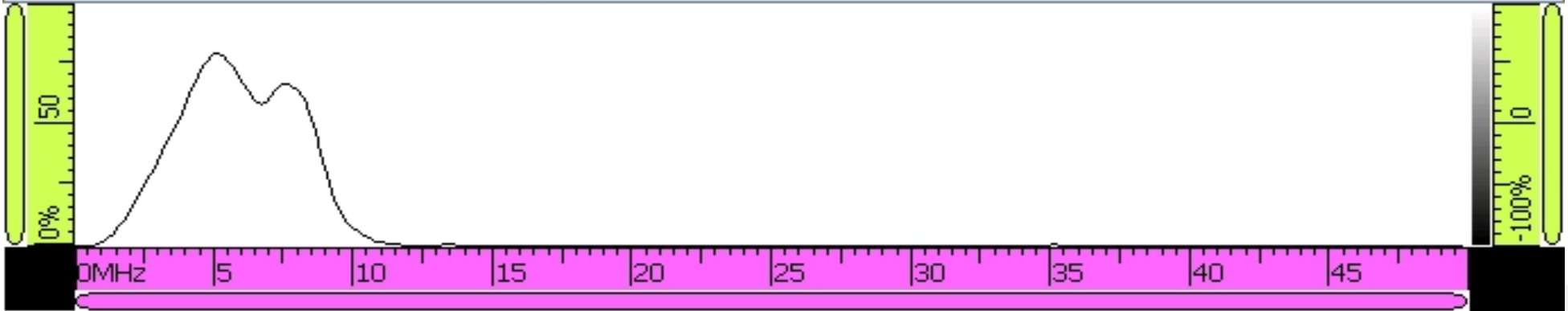


gate threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.08 MHz
-6 dB	3.13 MHz	8.79 MHz	5.96 MHz	5.66 MHz	95.08 %		
-20 dB	1.37 MHz	9.96 MHz	5.66 MHz	8.59 MHz	151.72 %		



Mode: **Pulse-Echo**
 material 0.5" thk PLEXIGLAS WEDGE
 "Save Image" as: File0049.jpg
 "Report Preview" as: File0049.htm
 Excel tab: 39

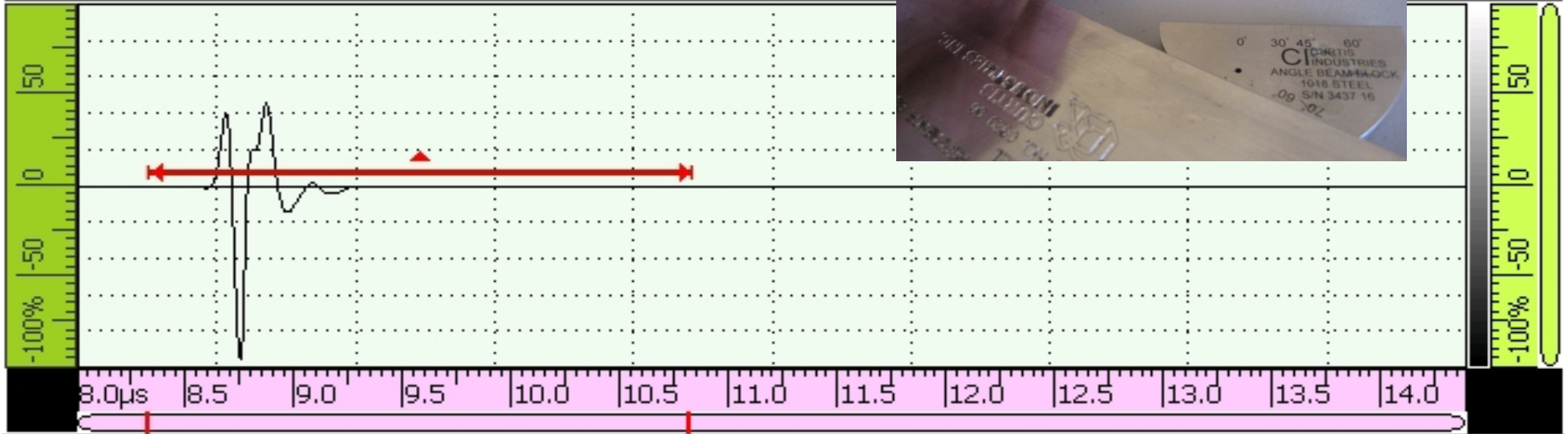
**10.0
MHz**

set-up photo:

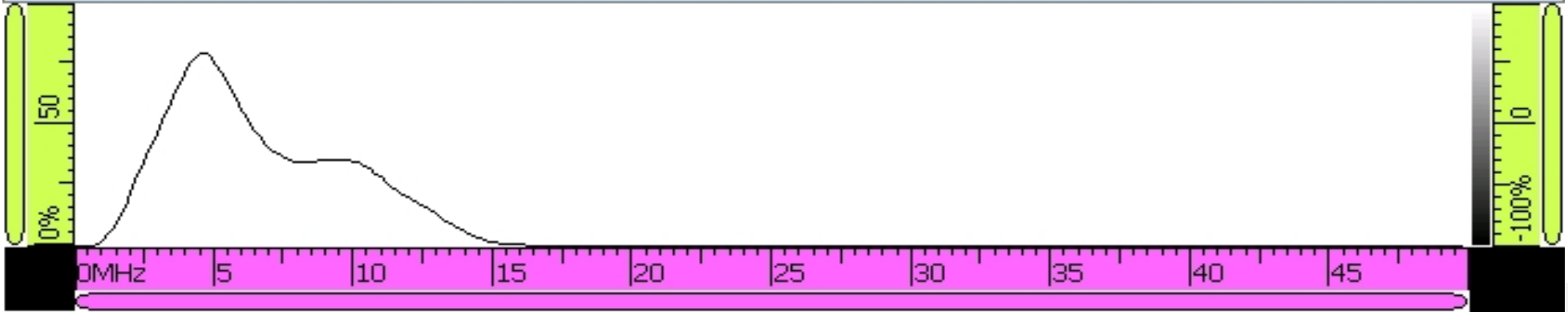


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.49 MHz
-6 dB	2.54 MHz	7.03 MHz	4.79 MHz	4.49 MHz	93.88 %		
-20 dB	1.37 MHz	13.67 MHz	7.52 MHz	12.30 MHz	163.64 %		



Mode: **Pulse-Echo**
 material 0.5" thk PLEXIGLAS WEDGE
 "Save Image" as: File0050.jpg
 "Report Preview" as: File0050.htm
 Excel tab: 40

**10.0
MHz**

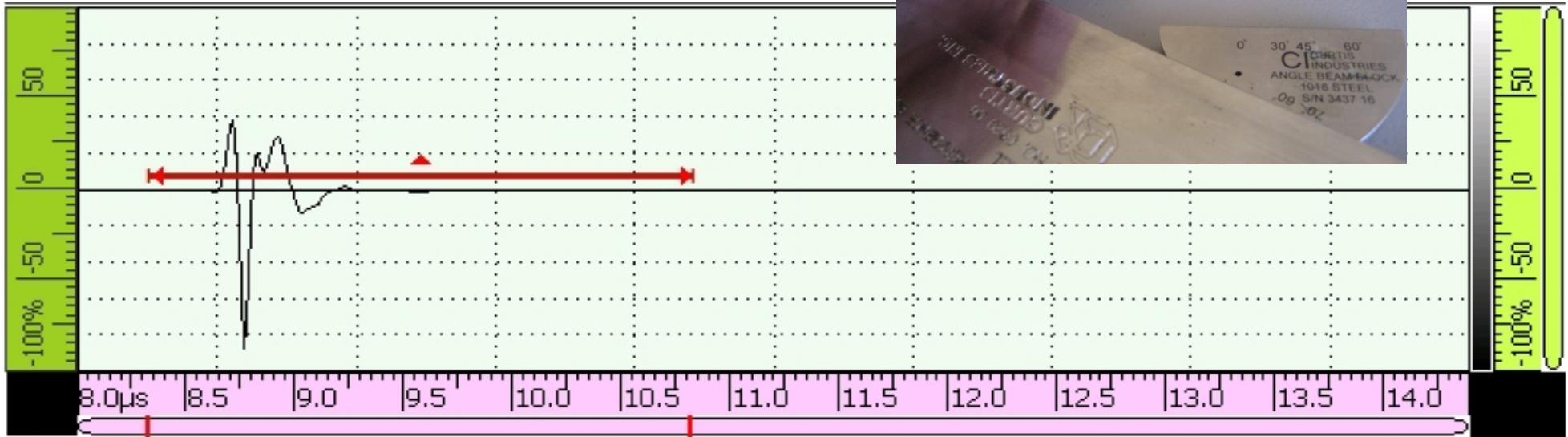
set-up photo:

S/N:
021TTM

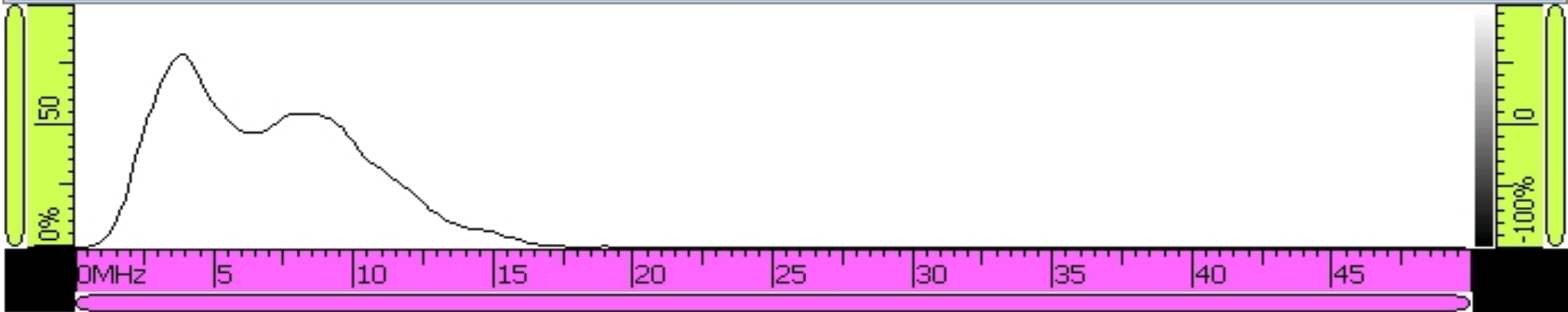


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.71 MHz
-6 dB	2.15 MHz	10.35 MHz	6.25 MHz	8.20 MHz	131.25 %		
-20 dB	1.17 MHz	14.06 MHz	7.62 MHz	12.89 MHz	169.23 %		

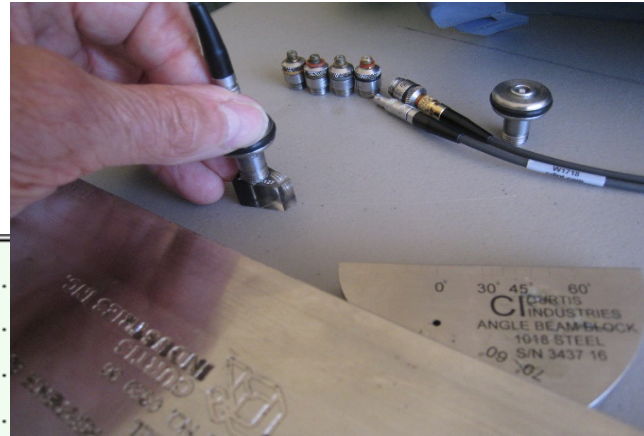


Mode: **Pulse-Echo**
 material 0.5" thk PLEXIGLAS WEDGE
 "Save Image" as: File0051.jpg
 "Report Preview" as: File0051.htm
 Excel tab: 41

**15.0
MHz**

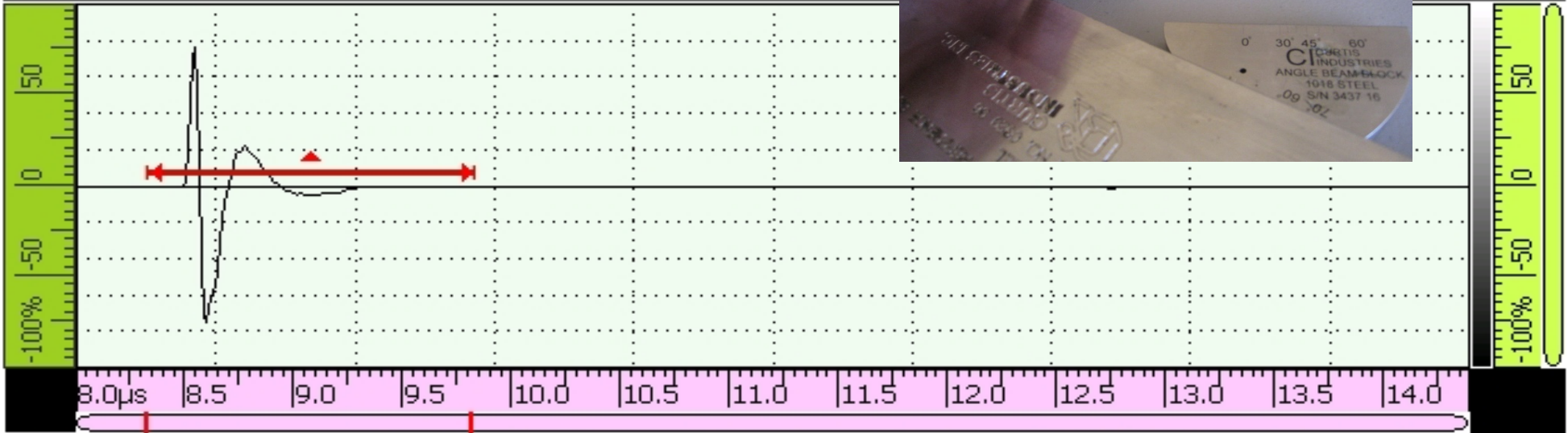
set-up photo:

S/N:
024PY3

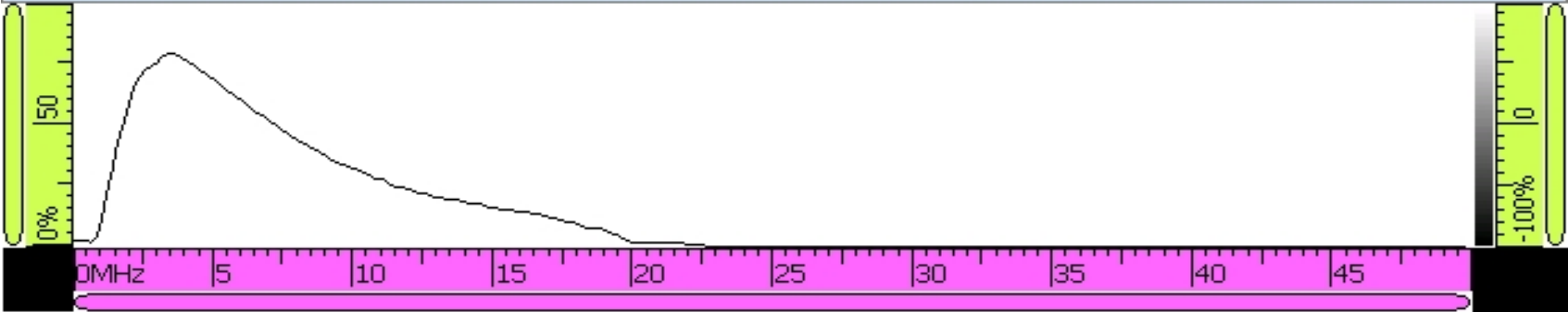


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.52 MHz
-6 dB	1.37 MHz	8.79 MHz	5.08 MHz	7.42 MHz	146.15 %		
-20 dB	0.78 MHz	18.36 MHz	9.57 MHz	17.58 MHz	183.67 %		



Mode: **Pulse-Echo**
 material 0.5" thk PLEXIGLAS WEDGE
 "Save Image" as: File0052.jpg
 "Report Preview" as: File0052.htm
 Excel tab: 42

**15.0
MHz**

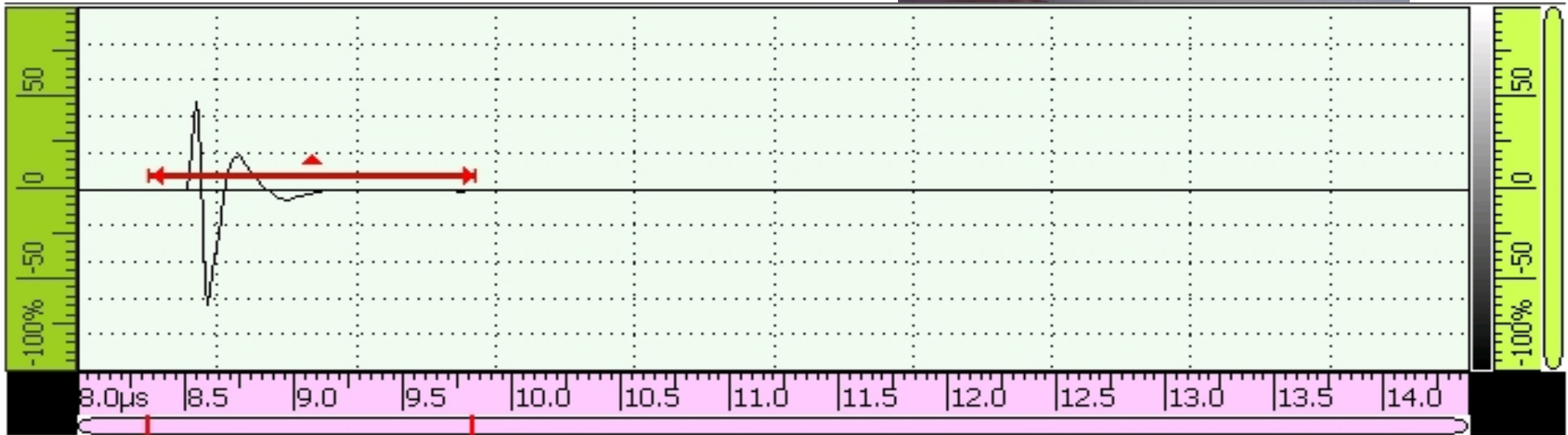
set-up photo:

S/N:
024PY4

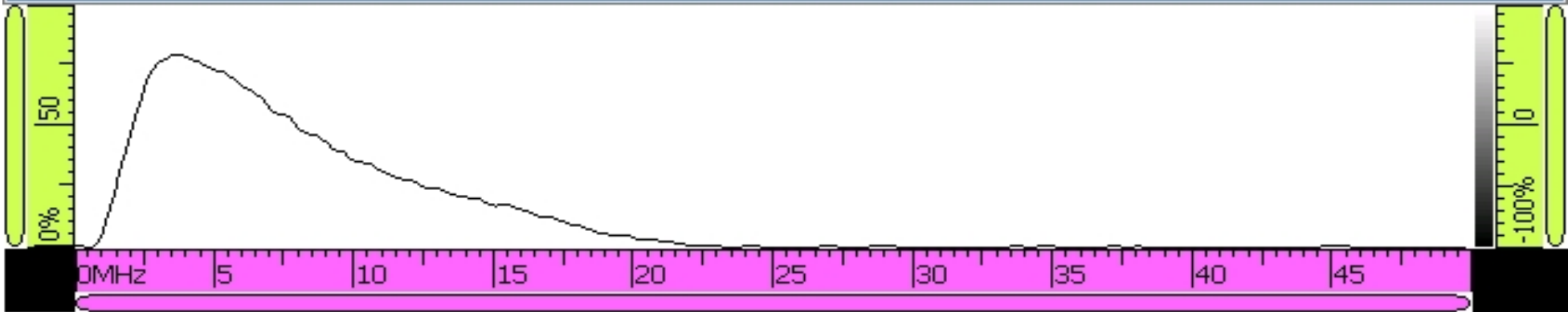


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.71 MHz
-6 dB	1.76 MHz	9.57 MHz	5.66 MHz	7.81 MHz	137.93 %		
-20 dB	0.98 MHz	18.36 MHz	9.67 MHz	17.38 MHz	179.80 %		

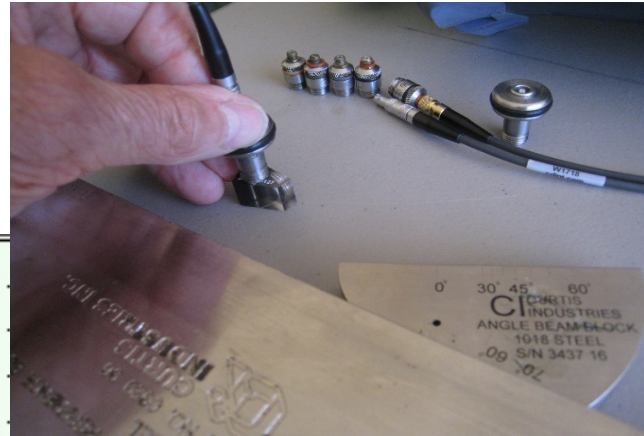


Mode: **Pulse-Echo**
 material 0.425" thk PMMA WEDGE
 "Save Image" as: File0053.jpg
 "Report Preview" as: File0053.htm
 Excel tab: 43

**2.25
MHz**

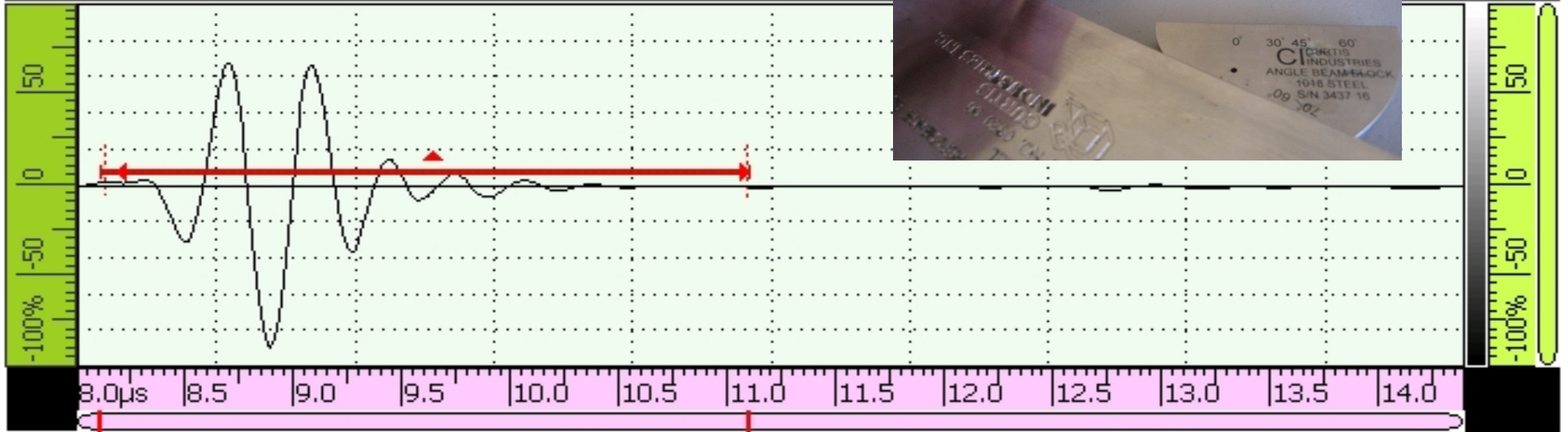
set-up photo:

S/N:
011DHW

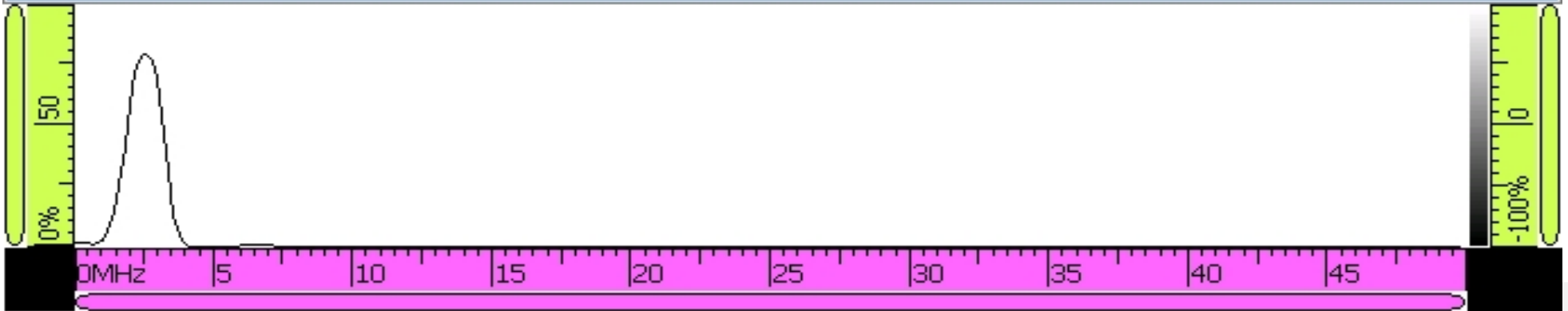


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	2.54 MHz
-6 dB	1.56 MHz	3.32 MHz	2.44 MHz	1.76 MHz	72.00 %		
-20 dB	1.17 MHz	3.71 MHz	2.44 MHz	2.54 MHz	104.00 %		

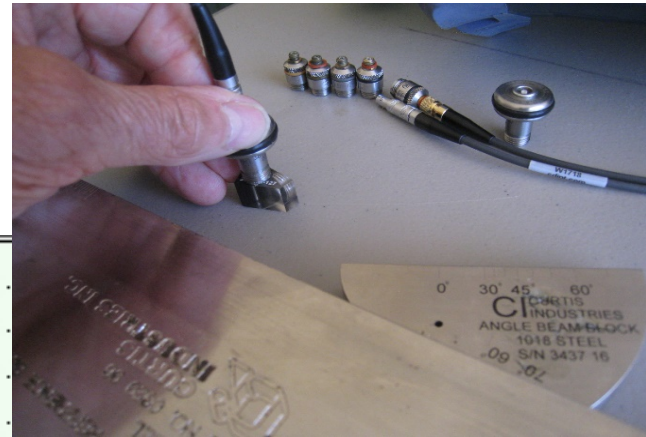


Mode: **Pulse-Echo**
 material 0.425" thk PMMA WEDGE
 "Save Image" as: File0054.jpg
 "Report Preview" as: File0054.htm
 Excel tab: 44

5.0 MHz

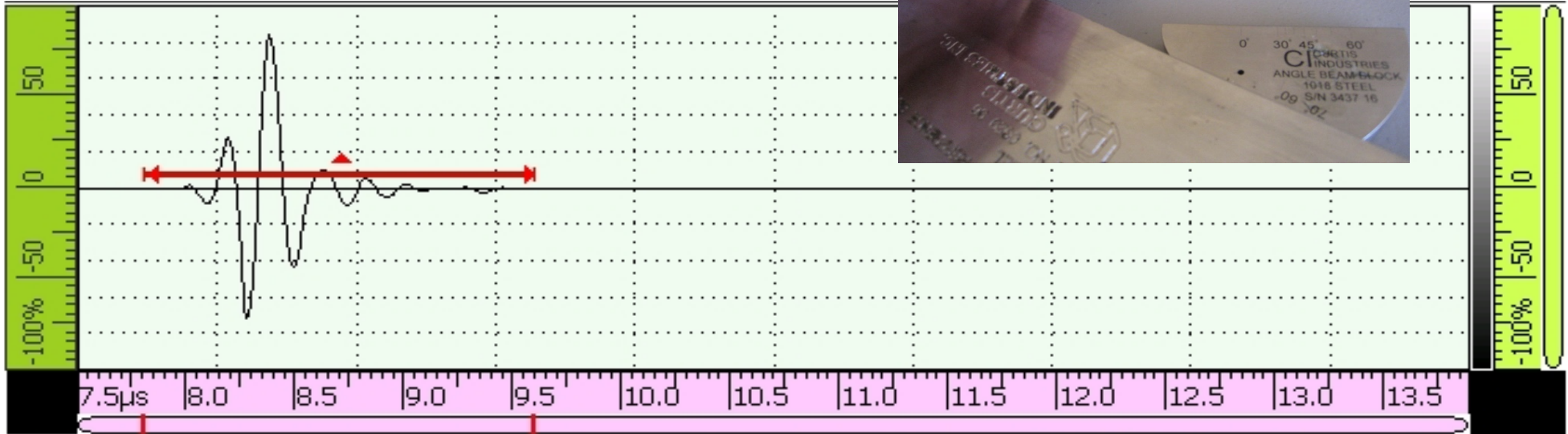
set-up photo:

S/N:
011KP5

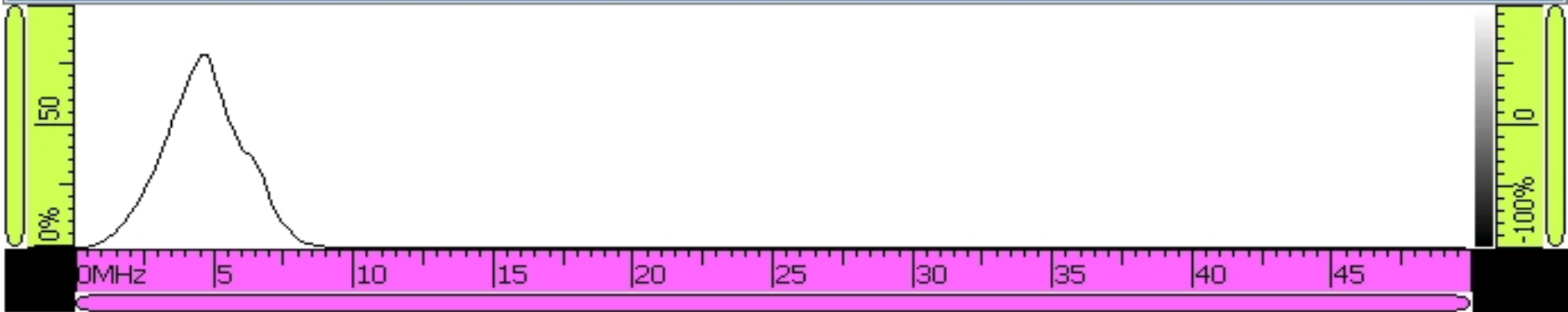


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.49 MHz
-6 dB	2.93 MHz	6.05 MHz	4.49 MHz	3.13 MHz	69.57 %		
-20 dB	1.37 MHz	7.62 MHz	4.49 MHz	6.25 MHz	139.13 %		



Mode: **Pulse-Echo**
 material 0.425" thk PMMA WEDGE
 "Save Image" as: File0055.jpg
 "Report Preview" as: File0055.htm
 Excel tab: 45

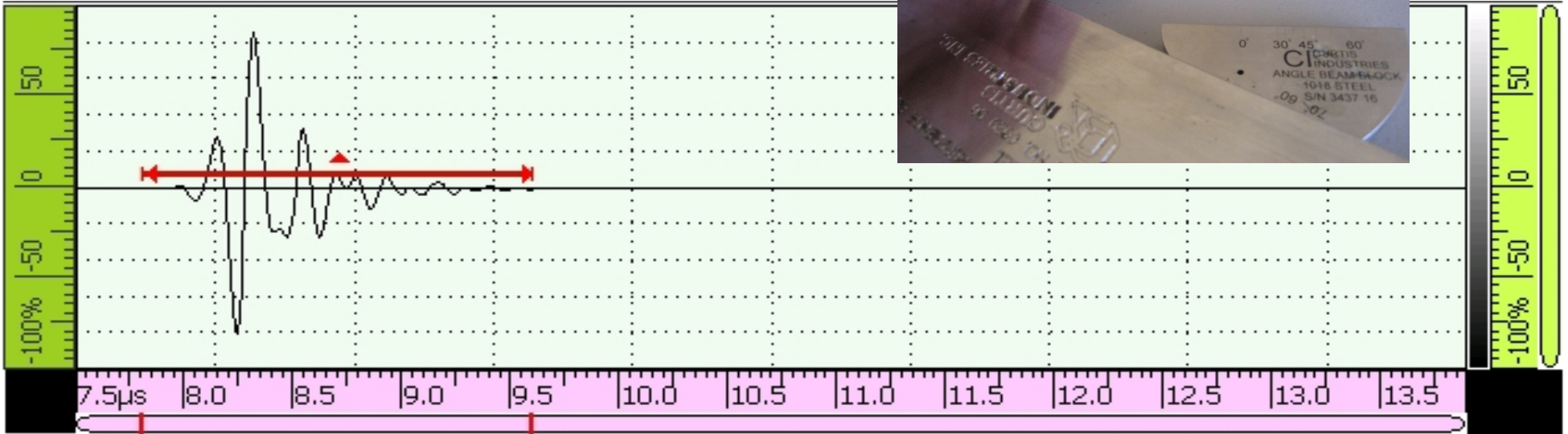
7.5 MHz

set-up photo:
 S/N:
 022W3N

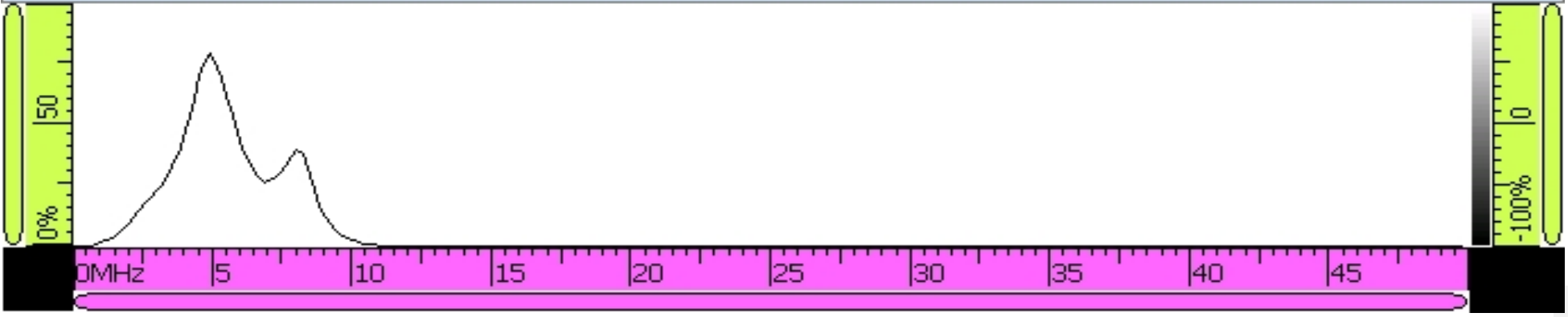


gate
 threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.88 MHz
-6 dB	3.71 MHz	6.25 MHz	4.98 MHz	2.54 MHz	50.98 %		
-20 dB	1.76 MHz	9.38 MHz	5.57 MHz	7.62 MHz	136.84 %		



Mode: **Pulse-Echo**
 material 0.425" thk PMMA WEDGE
 "Save Image" as: File0056.jpg
 "Report Preview" as: File0056.htm
 Excel tab: 46

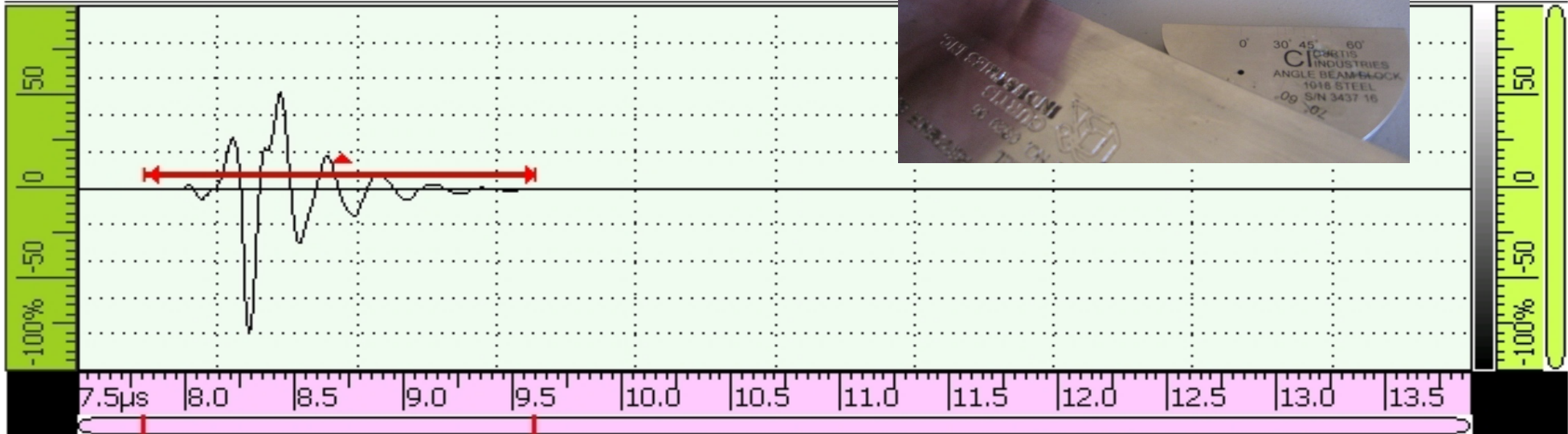
**10.0
MHz**

set-up photo:

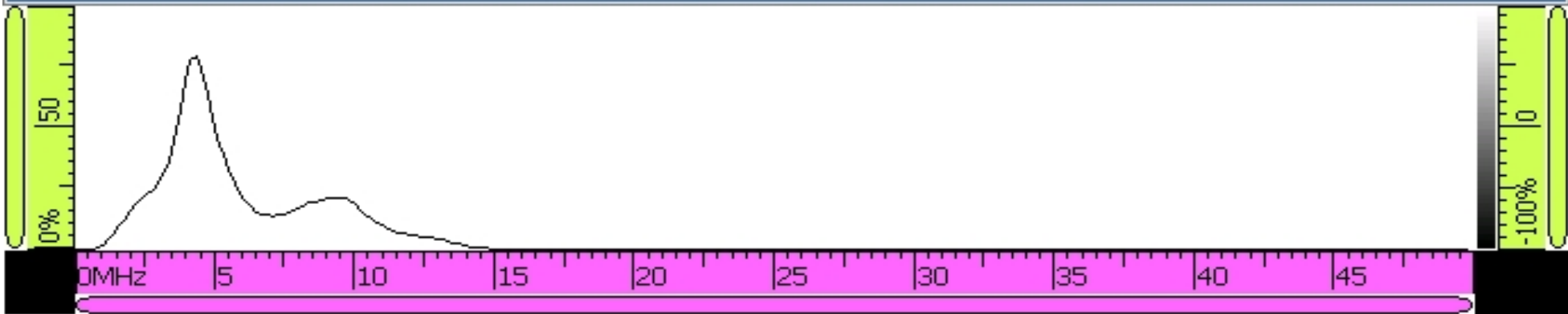


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.30 MHz
-6 dB	3.32 MHz	5.27 MHz	4.30 MHz	1.95 MHz	45.45 %		
-20 dB	1.37 MHz	11.33 MHz	6.35 MHz	9.96 MHz	156.92 %		



Mode: **Pulse-Echo**
 material 0.425" thk PMMA WEDGE
 "Save Image" as: File0057.jpg
 "Report Preview" as: File0057.htm
 Excel tab: 47

**10.0
MHz**

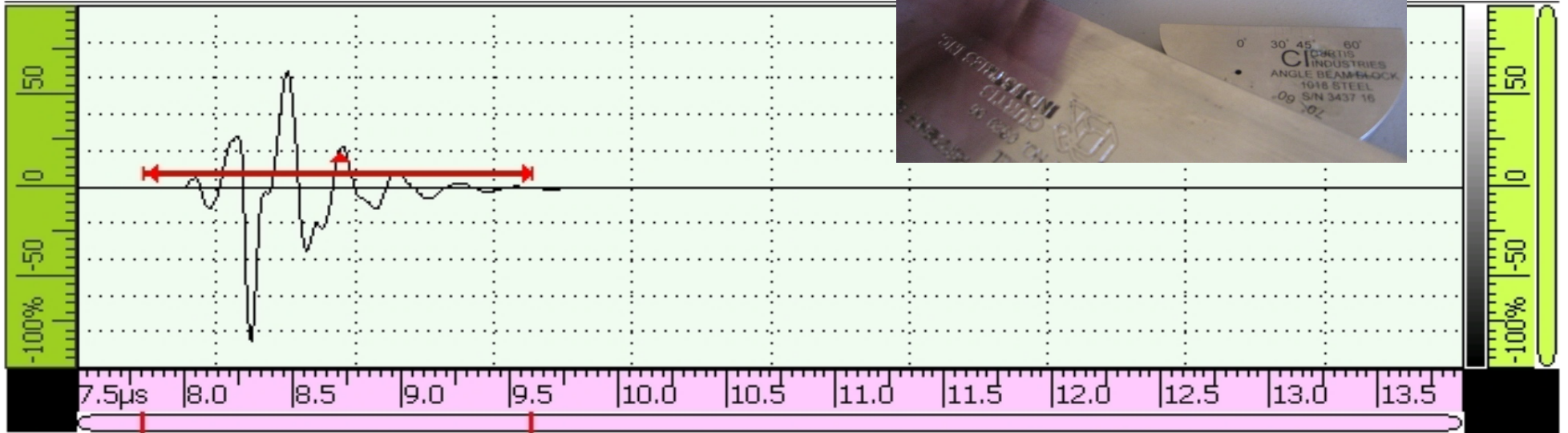
set-up photo:

S/N:
021TTM

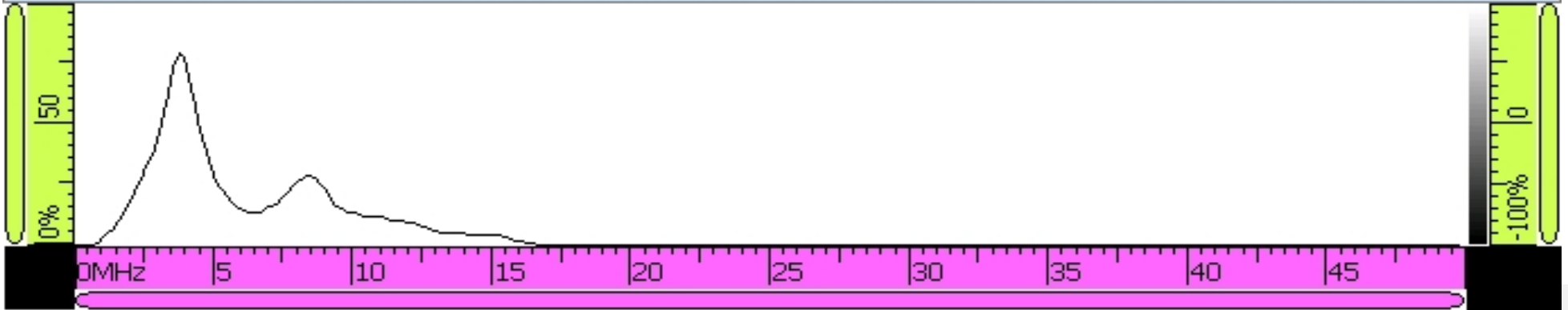


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.71 MHz
-6 dB	2.73 MHz	4.69 MHz	3.71 MHz	1.95 MHz	52.63 %		
-20 dB	1.37 MHz	12.50 MHz	6.93 MHz	11.13 MHz	160.56 %		

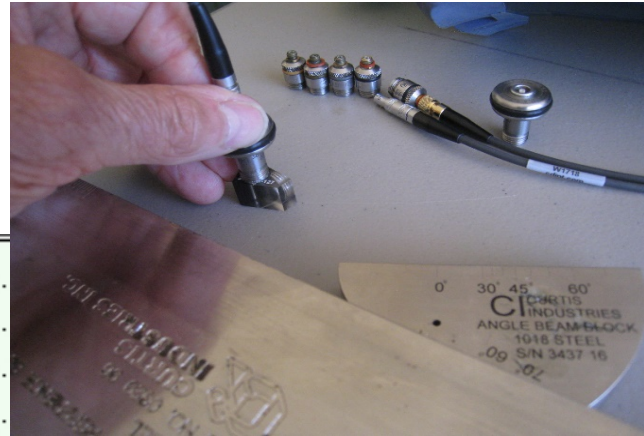


Mode: **Pulse-Echo**
 material 0.425" thk PMMA WEDGE
 "Save Image" as: File0058.jpg
 "Report Preview" as: File0058.htm
 Excel tab: 48

**15.0
MHz**

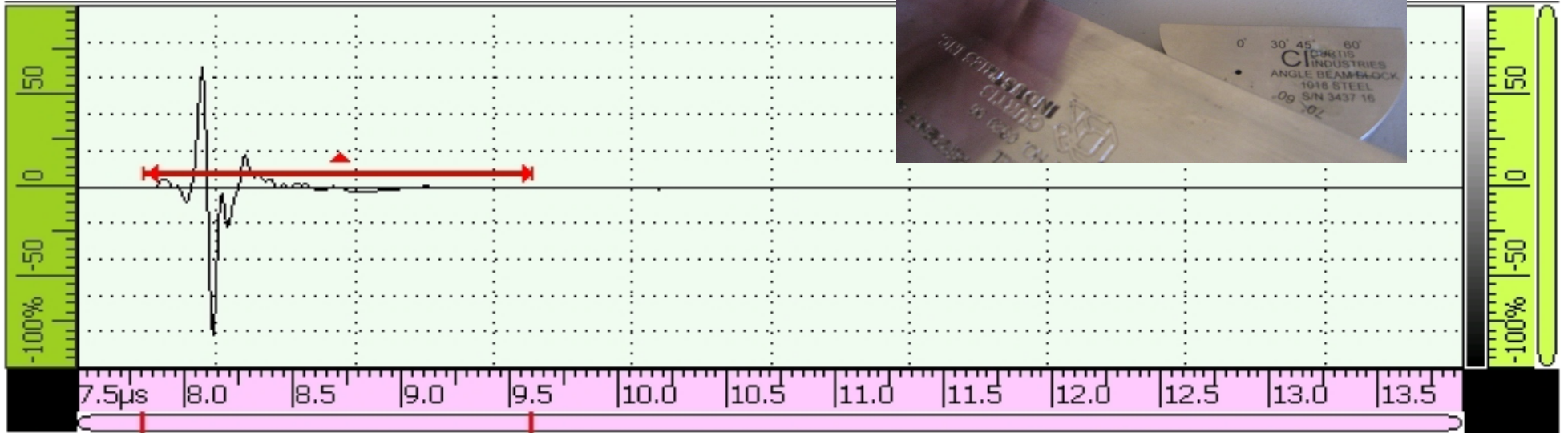
set-up photo:

S/N:
024PY3

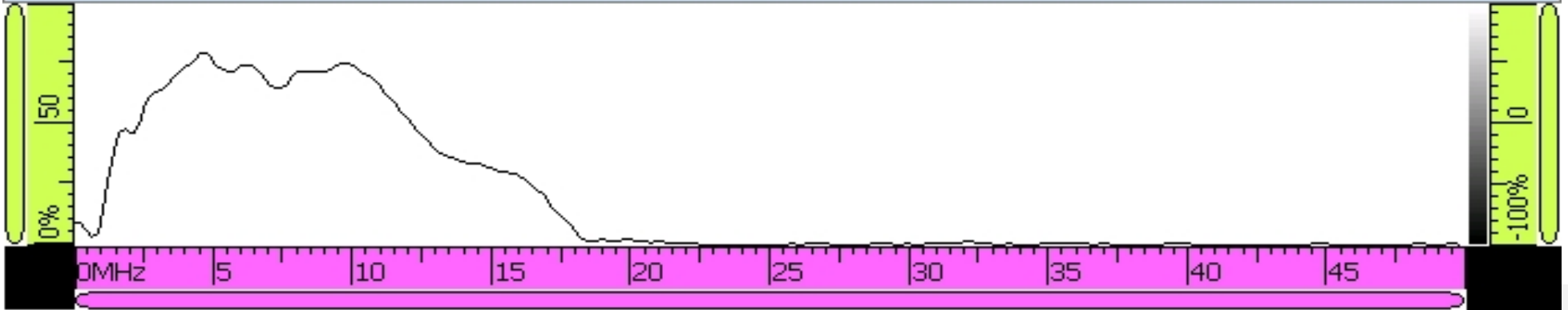


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.69 MHz
-6 dB	1.37 MHz	13.09 MHz	7.23 MHz	11.72 MHz	162.16 %		
-20 dB	0.78 MHz	17.97 MHz	9.38 MHz	17.19 MHz	183.33 %		

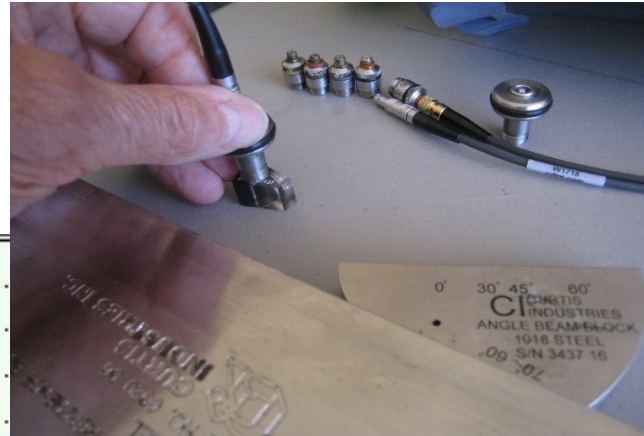


Mode: **Pulse-Echo**
 material 0.425" thk PMMA WEDGE
 "Save Image" as: File0059.jpg
 "Report Preview" as: File0059.htm
 Excel tab: 49

**15.0
MHz**

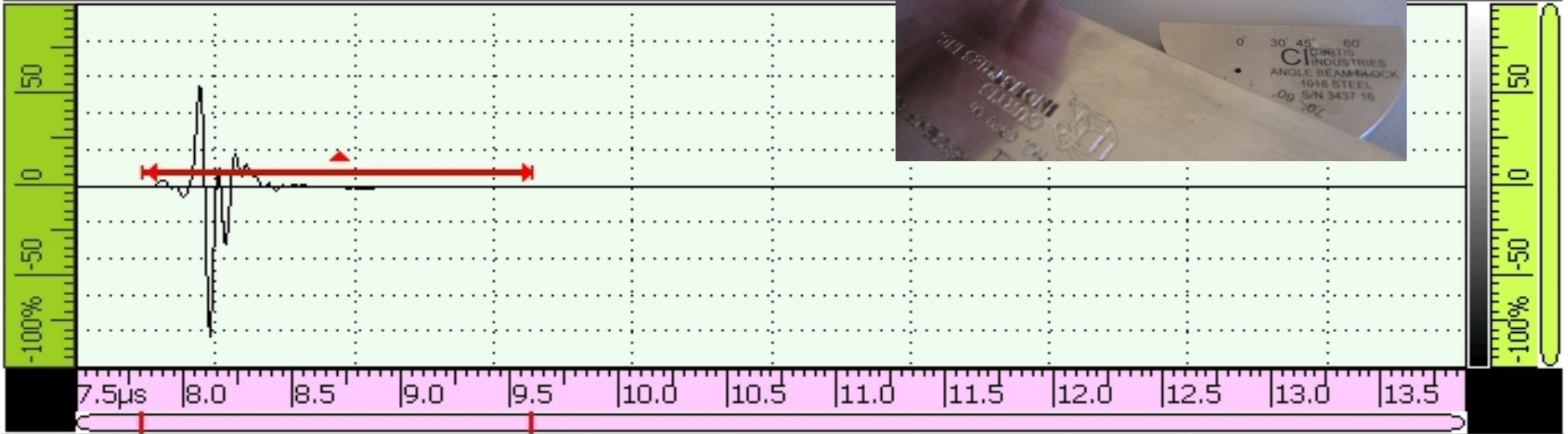
set-up photo:

S/N:
024PY4

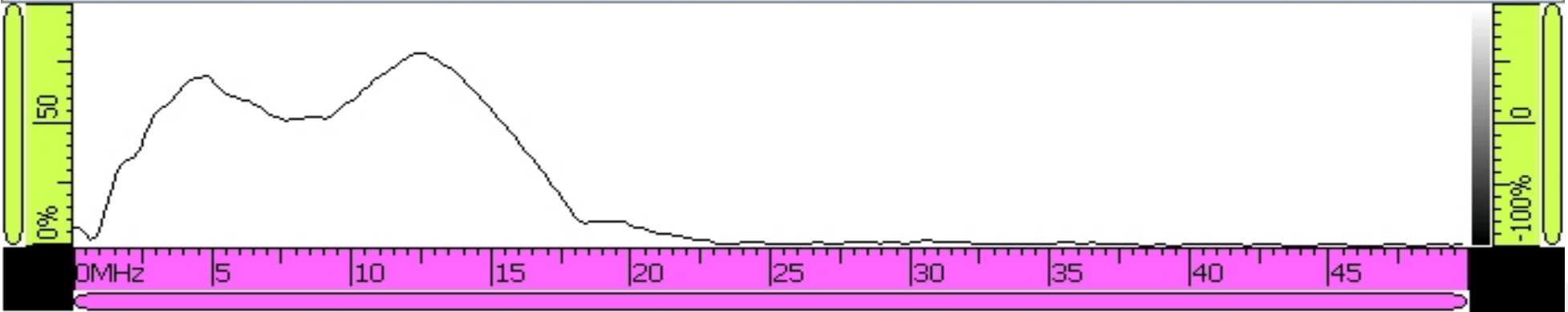


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	12.30 MHz
-6 dB	2.34 MHz	16.21 MHz	9.28 MHz	13.87 MHz	149.47 %		
-20 dB	0.78 MHz	20.12 MHz	10.45 MHz	19.34 MHz	185.05 %		



Mode: **PITCH-CATCH**
 material 0.555" REXOLITE/REXOLITE
 "Save Image" as: File0060.jpg
 "Report Preview" as: File0060.htm
 Excel tab: 50

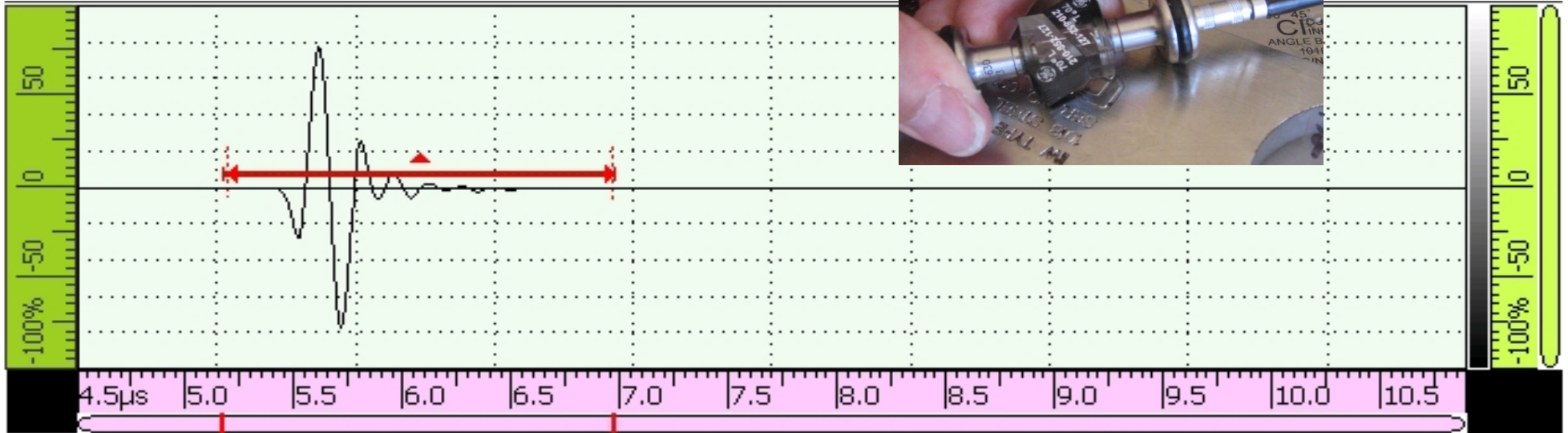
5.0 MHz

set-up photo:

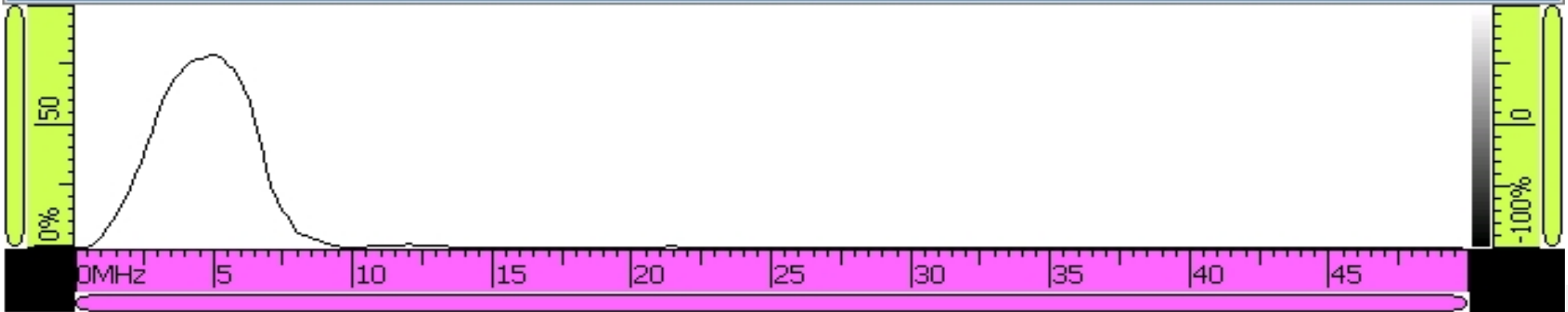


gate threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.88 MHz
-6 dB	2.34 MHz	6.84 MHz	4.59 MHz	4.49 MHz	97.87 %		
-20 dB	0.98 MHz	8.01 MHz	4.49 MHz	7.03 MHz	156.52 %		



Mode: **PITCH-CATCH**
 material 0.555" REXOLITE/REXOLITE
 "Save Image" as: File0061.jpg
 "Report Preview" as: File0061.htm
 Excel tab: 51

7.5 MHz

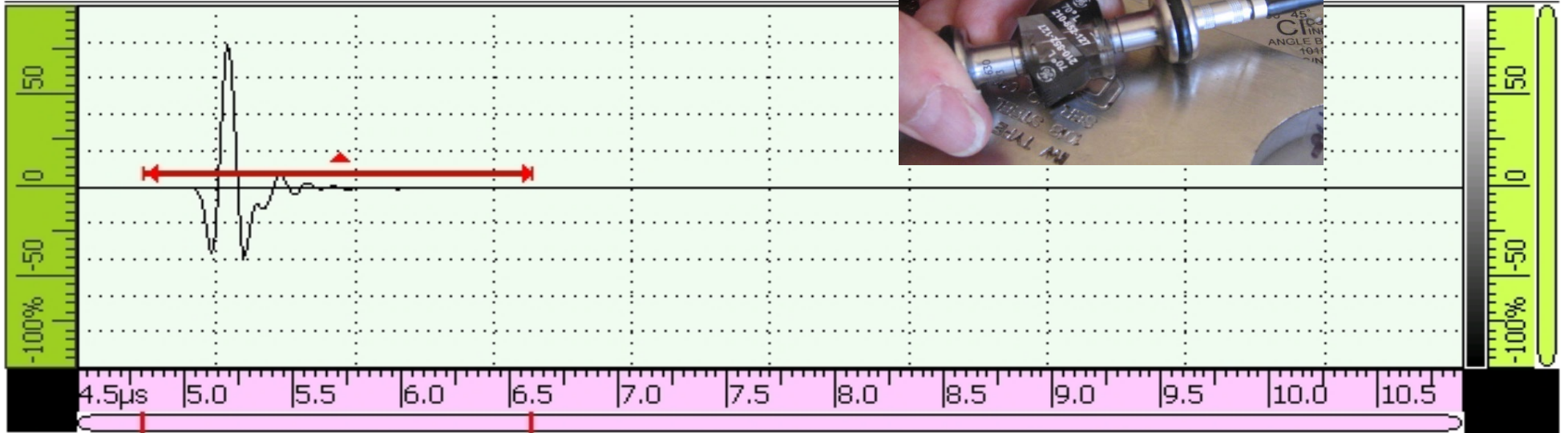
set-up photo:

S/N:
 022w3n
 015fwm

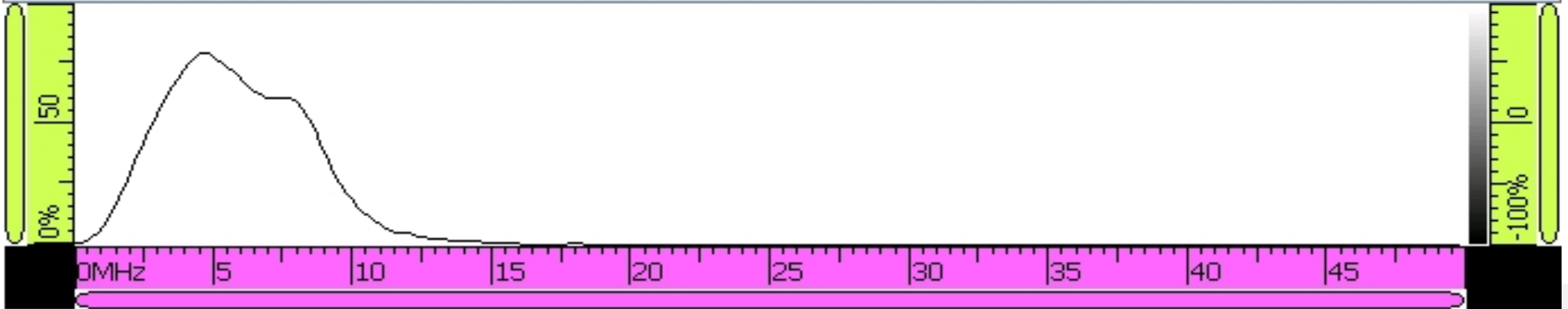


gate
 threshold:

7%



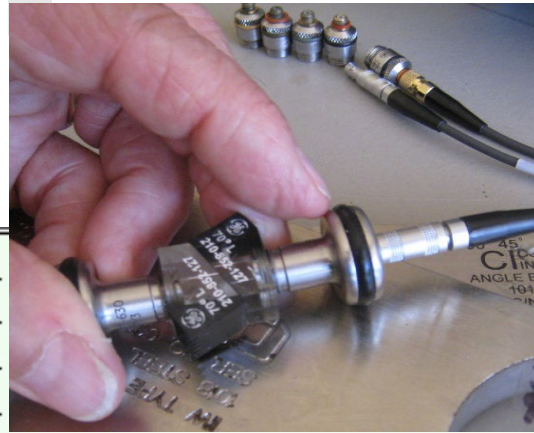
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.69 MHz
-6 dB	2.15 MHz	8.98 MHz	5.57 MHz	6.84 MHz	122.81 %		
-20 dB	0.98 MHz	11.13 MHz	6.05 MHz	10.16 MHz	167.74 %		



Mode: **PITCH-CATCH**
 material 0.555" REXOLITE/REXOLITE
 "Save Image" as: File0062.jpg
 "Report Preview" as: File0062.htm
 Excel tab: 52

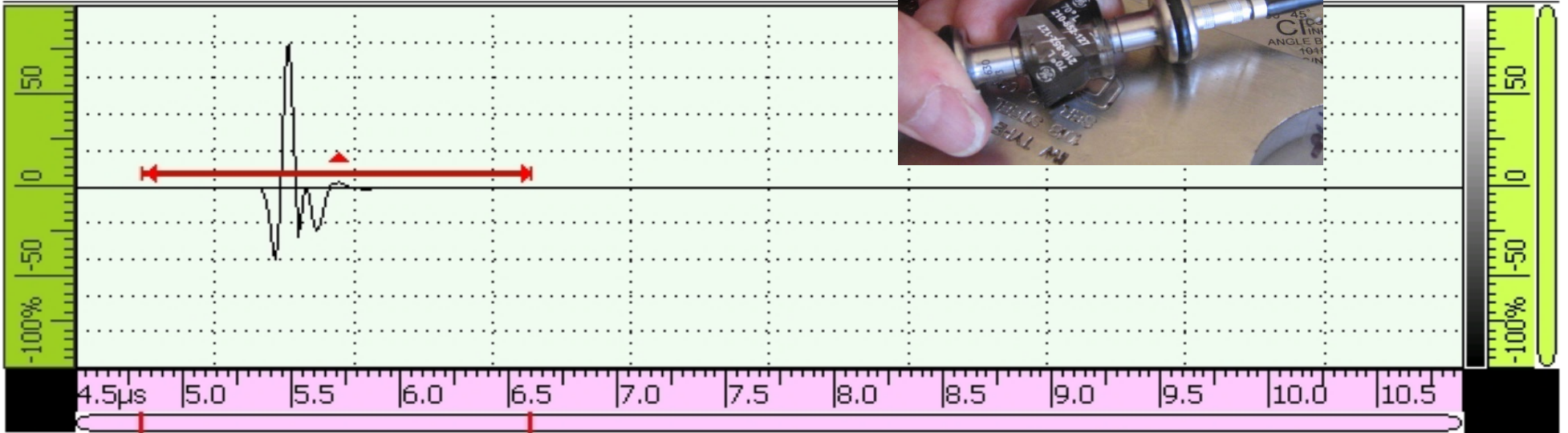
**10.0
MHz**

set-up photo:

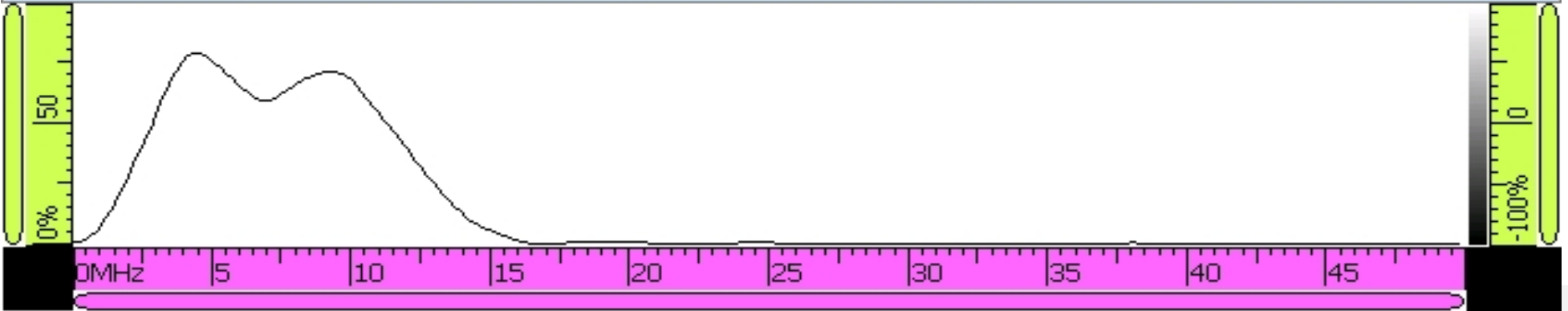


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.30 MHz
-6 dB	2.34 MHz	12.11 MHz	7.23 MHz	9.77 MHz	135.14 %		
-20 dB	0.78 MHz	14.65 MHz	7.71 MHz	13.87 MHz	179.75 %		



Mode: **PITCH-CATCH**
 material 0.555" REXOLITE/REXOLITE
 "Save Image" as: File0063.jpg
 "Report Preview" as: File0063.htm
 Excel tab: 53

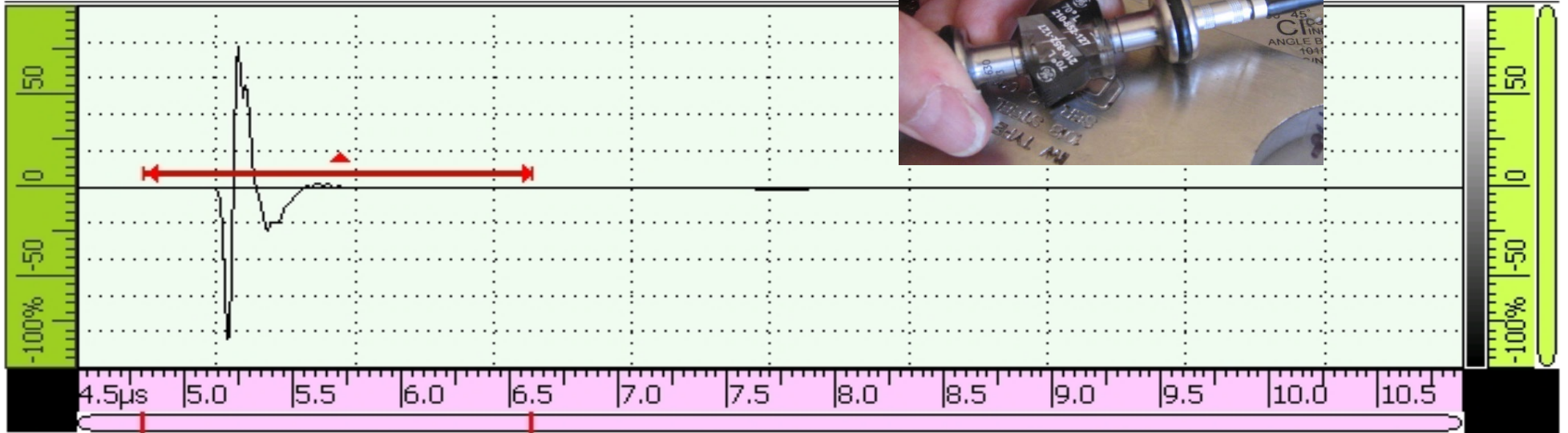
**15.0
MHz**

set-up photo:

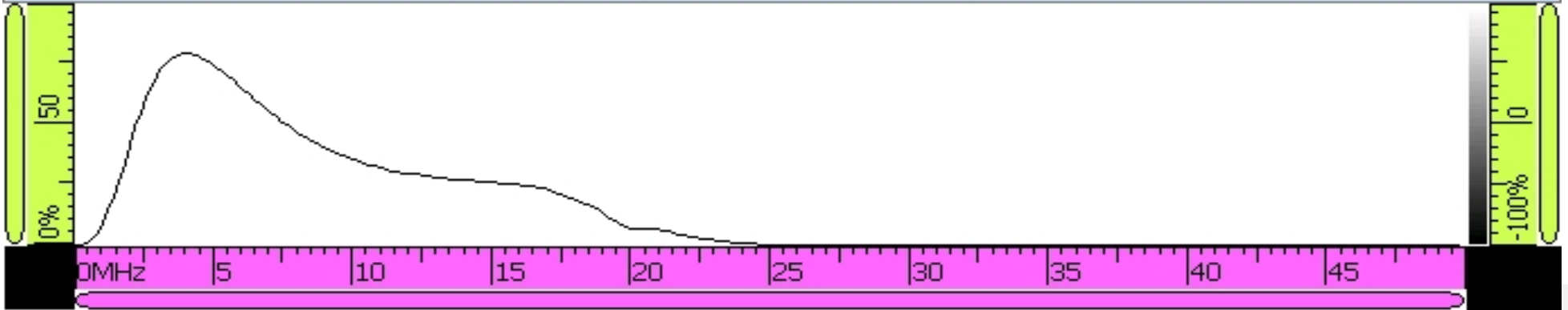


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.91 MHz
-6 dB	1.76 MHz	9.18 MHz	5.47 MHz	7.42 MHz	135.71 %		
-20 dB	0.78 MHz	19.73 MHz	10.25 MHz	18.95 MHz	184.76 %		



Mode: **PITCH-CATCH**
 material 0.34" PLEXIGLAS/PLEXIGLAS
 "Save Image" as: File0064.jpg
 "Report Preview" as: File0064.htm
 Excel tab: 54

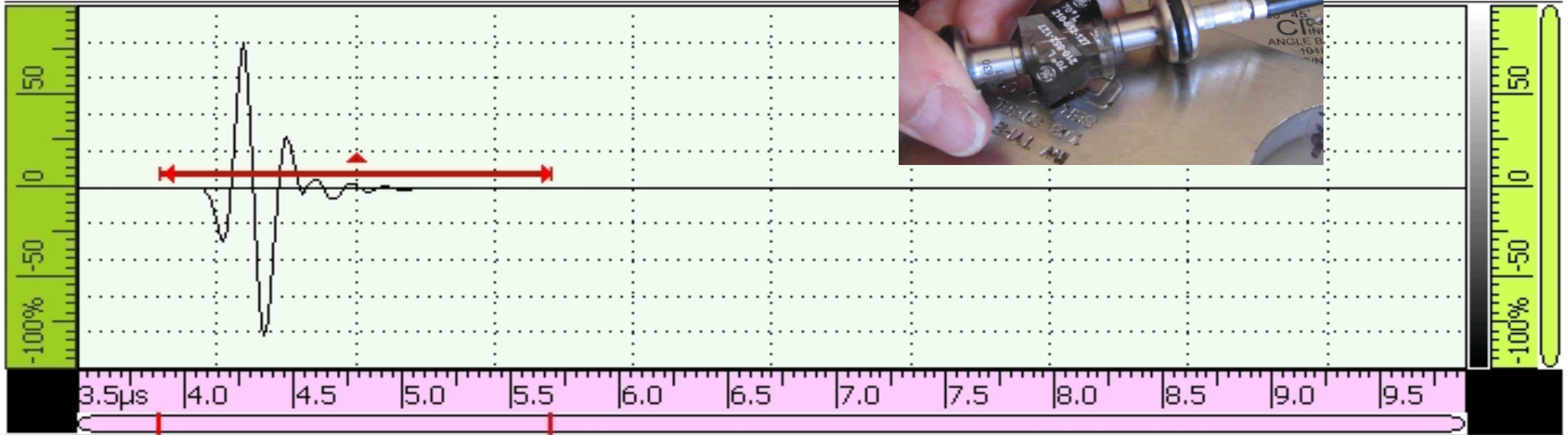
5.0 MHz

set-up photo:

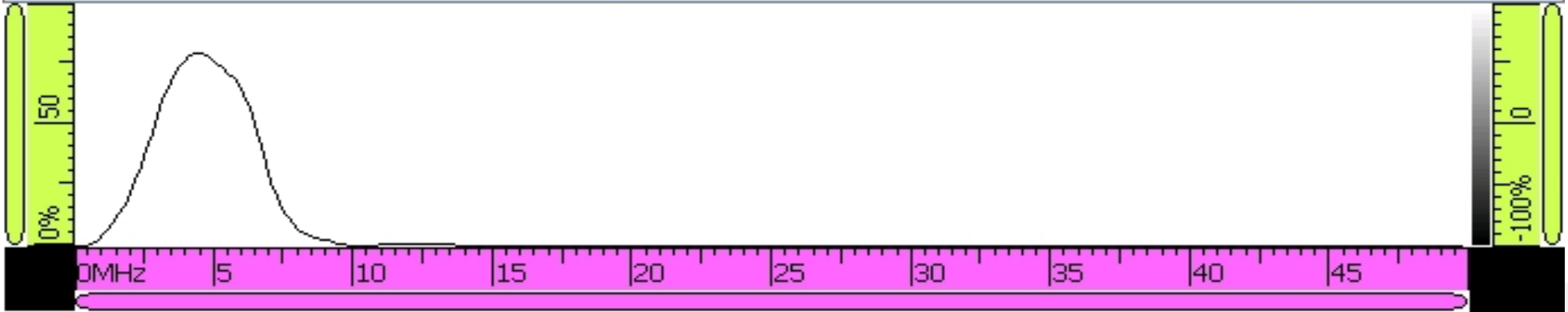


gate threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:
-6 dB	2.54 MHz	6.84 MHz	4.69 MHz	4.30 MHz	91.67 %	4.49 MHz
-20 dB	1.17 MHz	8.01 MHz	4.59 MHz	6.84 MHz	148.94 %	



Mode: **PITCH-CATCH**
 material 0.34" PLEXIGLAS/PLEXIGLAS
 "Save Image" as: File0065.jpg
 "Report Preview" as: File0065.htm
 Excel tab: 55

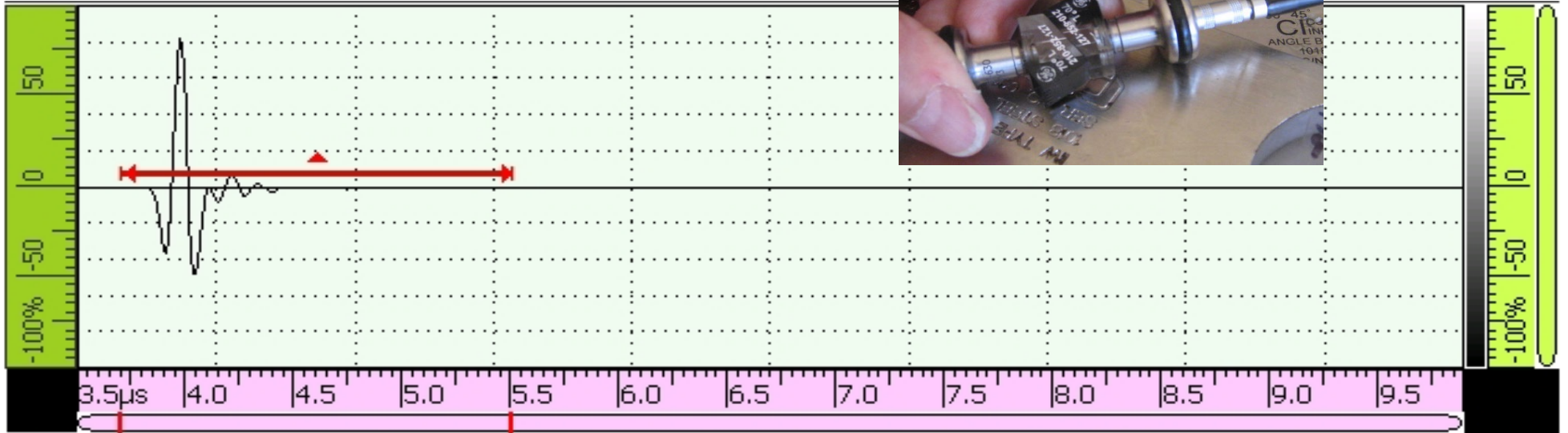
7.5 MHz

set-up photo:

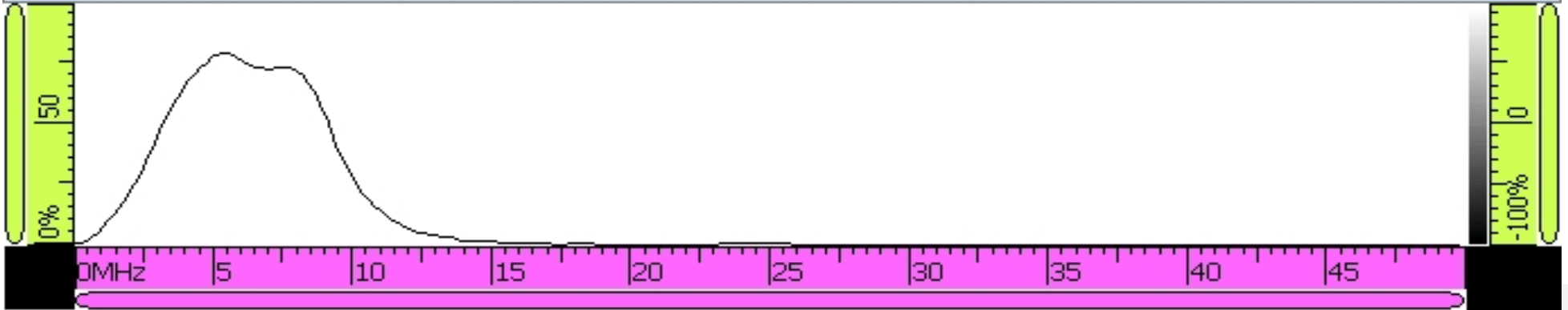


gate threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.27 MHz
-6 dB	2.73 MHz	9.57 MHz	6.15 MHz	6.84 MHz	111.11 %		
-20 dB	0.98 MHz	11.91 MHz	6.45 MHz	10.94 MHz	169.70 %		



Mode: **PITCH-CATCH**
 material 0.34" PLEXIGLAS/PLEXIGLAS
 "Save Image" as: File0066.jpg
 "Report Preview" as: File0066.htm
 Excel tab: 56

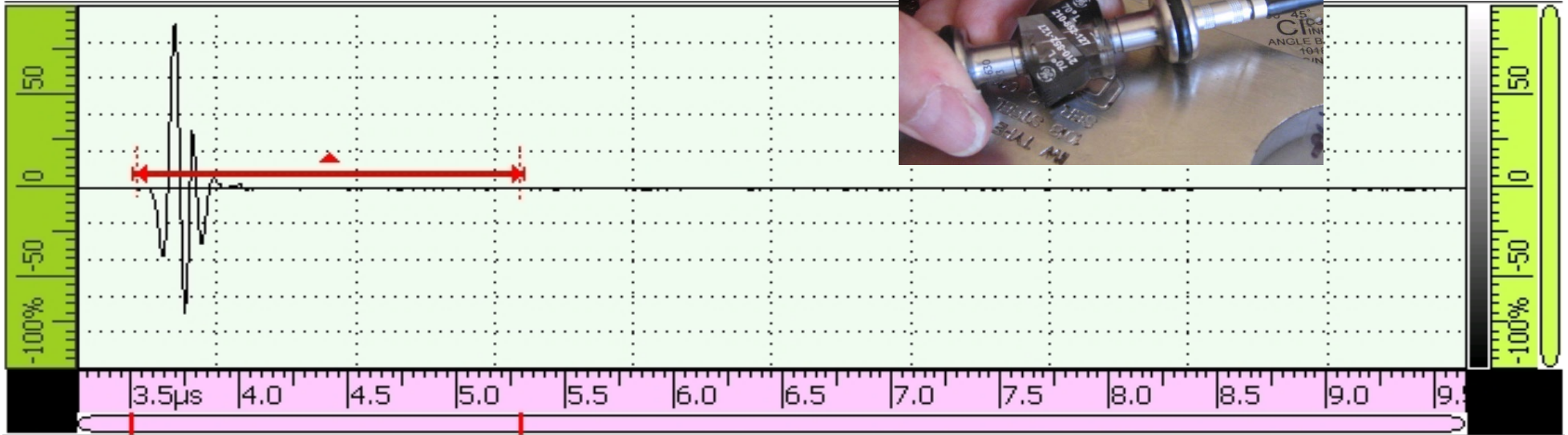
**10.0
MHz**

set-up photo:

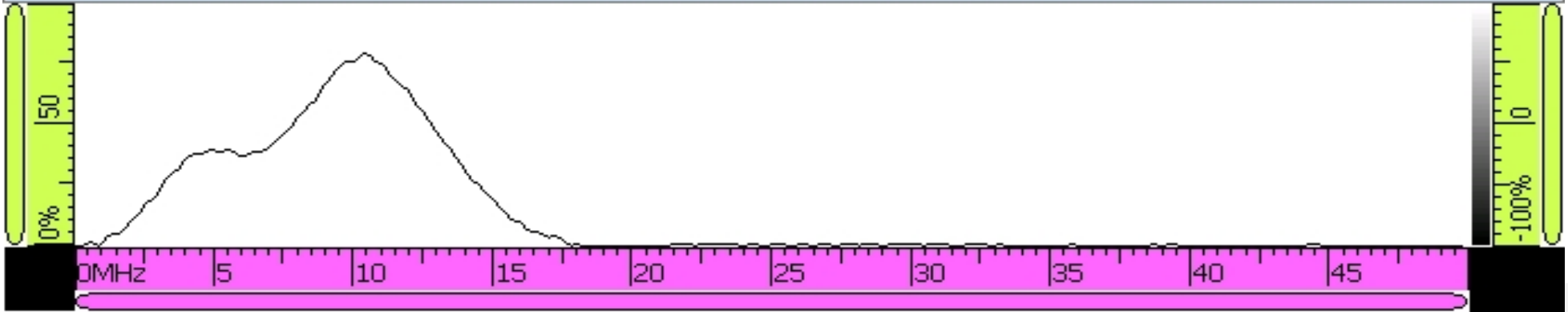


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	10.35 MHz
-6 dB	6.84 MHz	13.48 MHz	10.16 MHz	6.64 MHz	65.38 %		
-20 dB	1.76 MHz	16.21 MHz	8.98 MHz	14.45 MHz	160.87 %		



Mode: **PITCH-CATCH**
 material 0.34" PLEXIGLAS/PLEXIGLAS
 "Save Image" as: File0067.jpg
 "Report Preview" as: File0067.htm
 Excel tab: 57

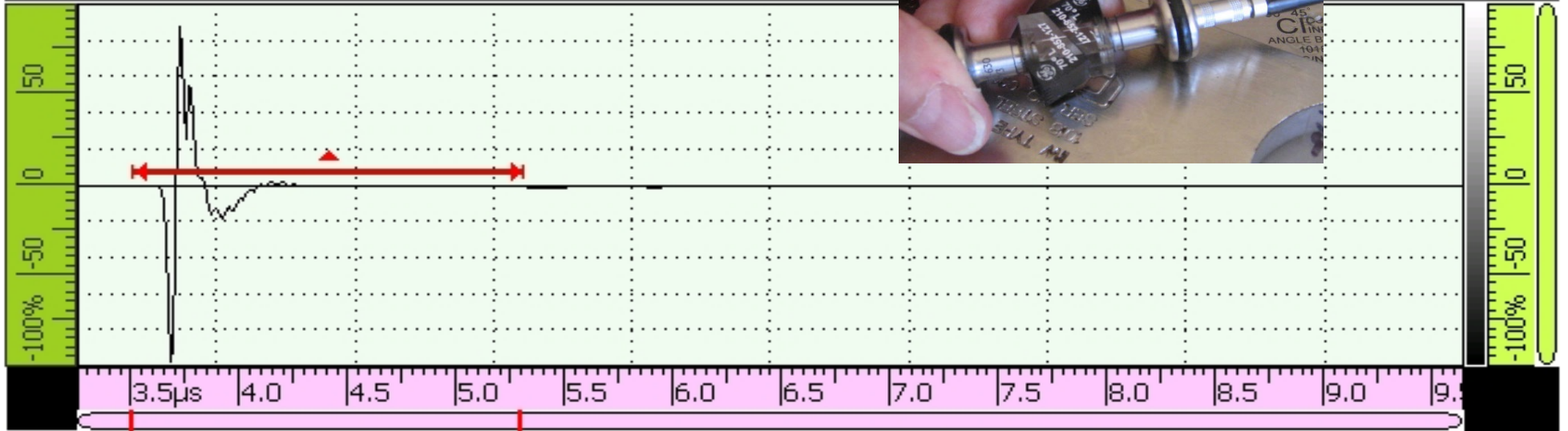
**15.0
MHz**

set-up photo:

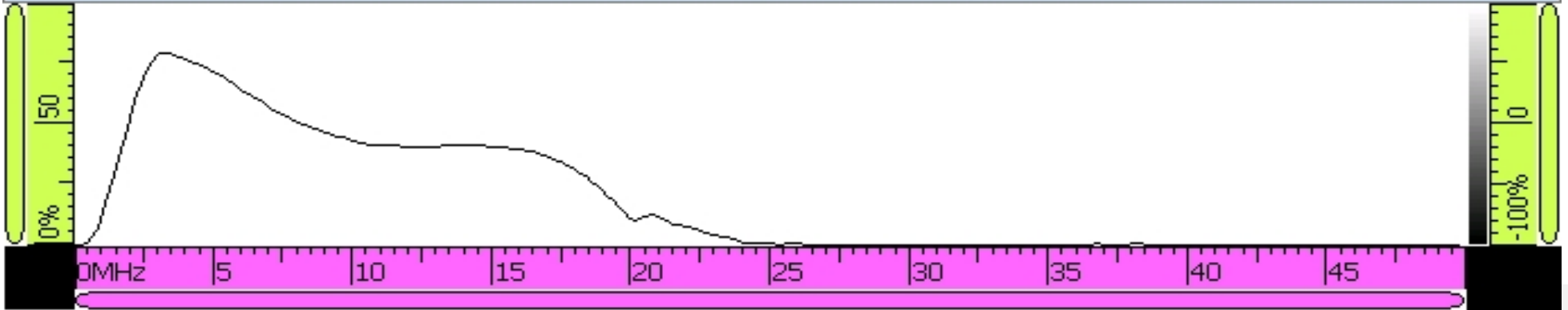


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.13 MHz
-6 dB	1.56 MHz	16.02 MHz	8.79 MHz	14.45 MHz	164.44 %		
-20 dB	0.78 MHz	21.88 MHz	11.33 MHz	21.09 MHz	186.21 %		



Mode: **PITCH-CATCH**
 material 0.355" PMMA/PMMA
 "Save Image" as: File0068.jpg
 "Report Preview" as: File0068.htm
 Excel tab: 58

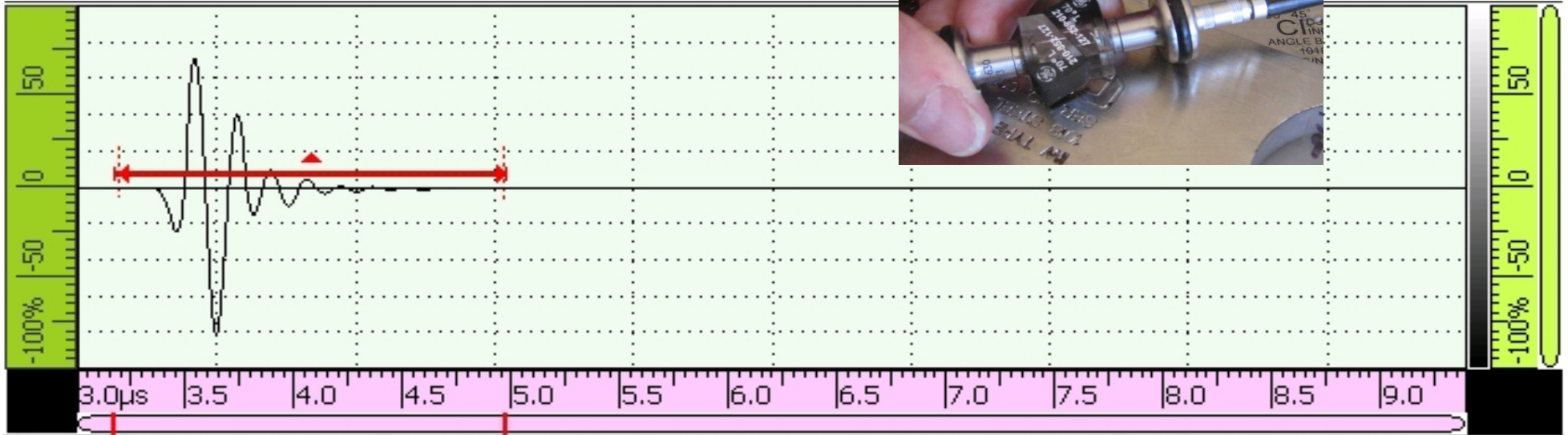
5.0 MHz

set-up photo:

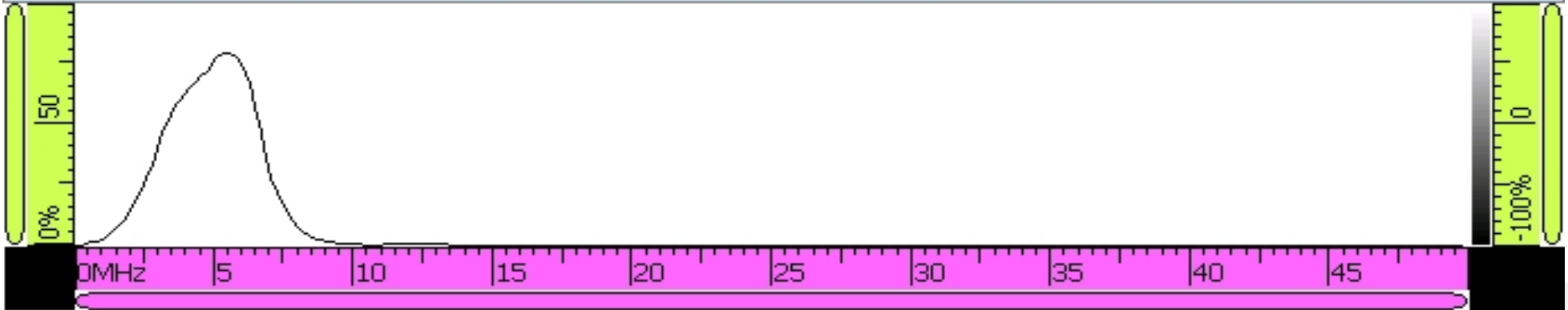


gate threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	5.47 MHz
-6 dB	2.73 MHz	6.84 MHz	4.79 MHz	4.10 MHz	85.71 %		
-20 dB	1.37 MHz	8.01 MHz	4.69 MHz	6.64 MHz	141.67 %		



Mode: **PITCH-CATCH**
 material 0.355" PMMA/PMMA
 "Save Image" as: File0069.jpg
 "Report Preview" as: File0069.htm
 Excel tab: 59

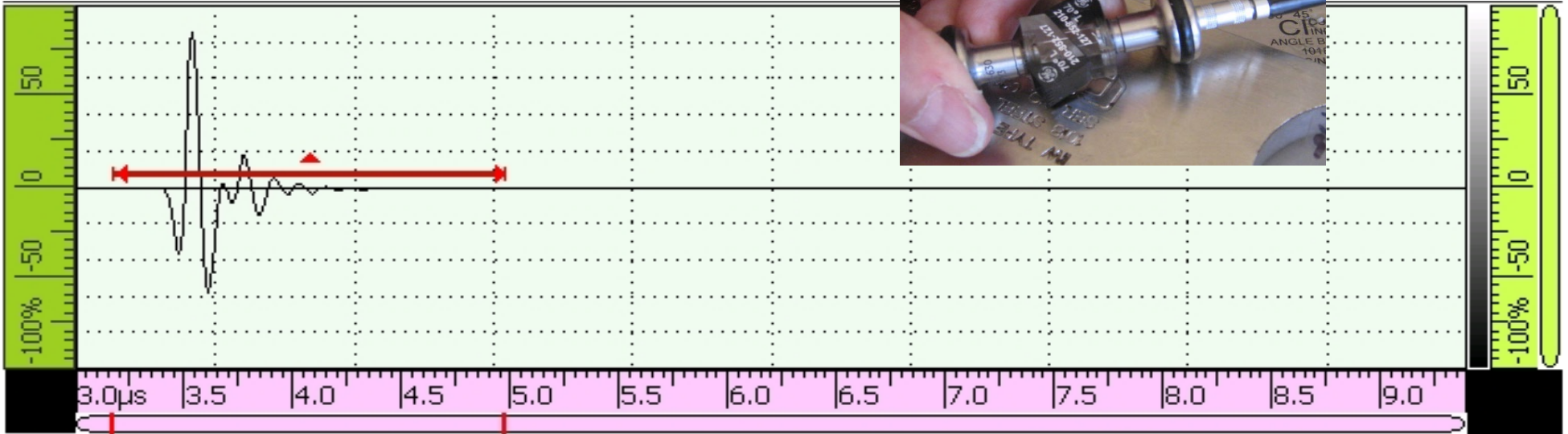
7.5 MHz

set-up photo:

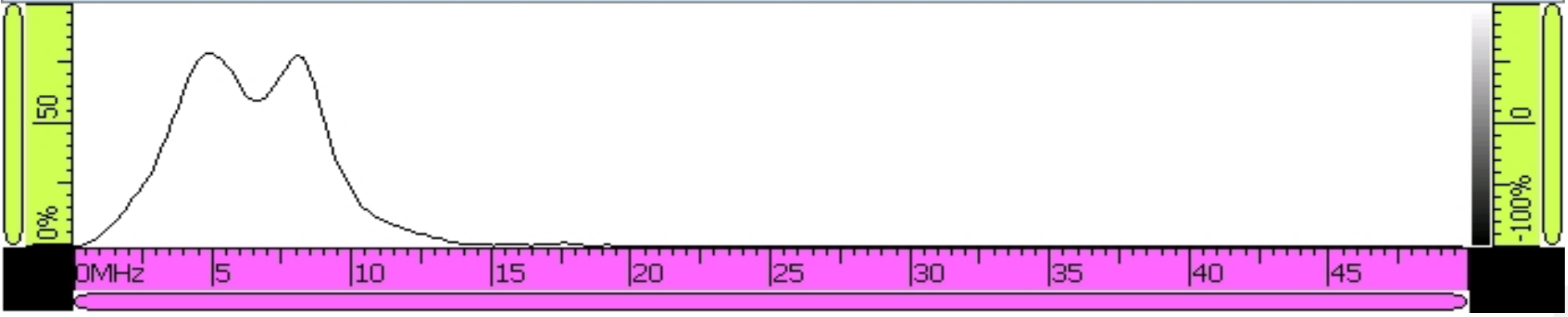


gate threshold:

7%



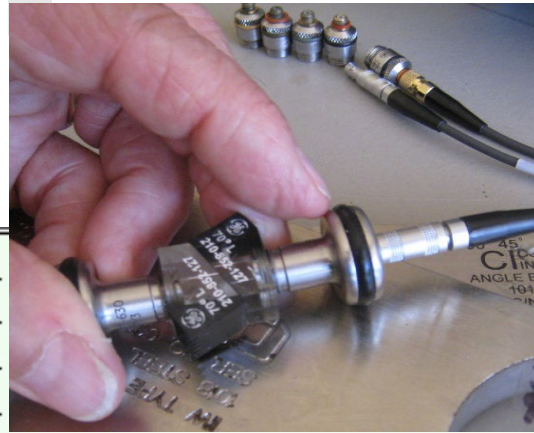
FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	4.88 MHz
-6 dB	3.13 MHz	9.38 MHz	6.25 MHz	6.25 MHz	100.00 %		
-20 dB	1.17 MHz	11.72 MHz	6.45 MHz	10.55 MHz	163.64 %		



Mode: **PITCH-CATCH**
 material 0.355" PMMA/PMMA
 "Save Image" as: File0070.jpg
 "Report Preview" as: File0070.htm
 Excel tab: 60

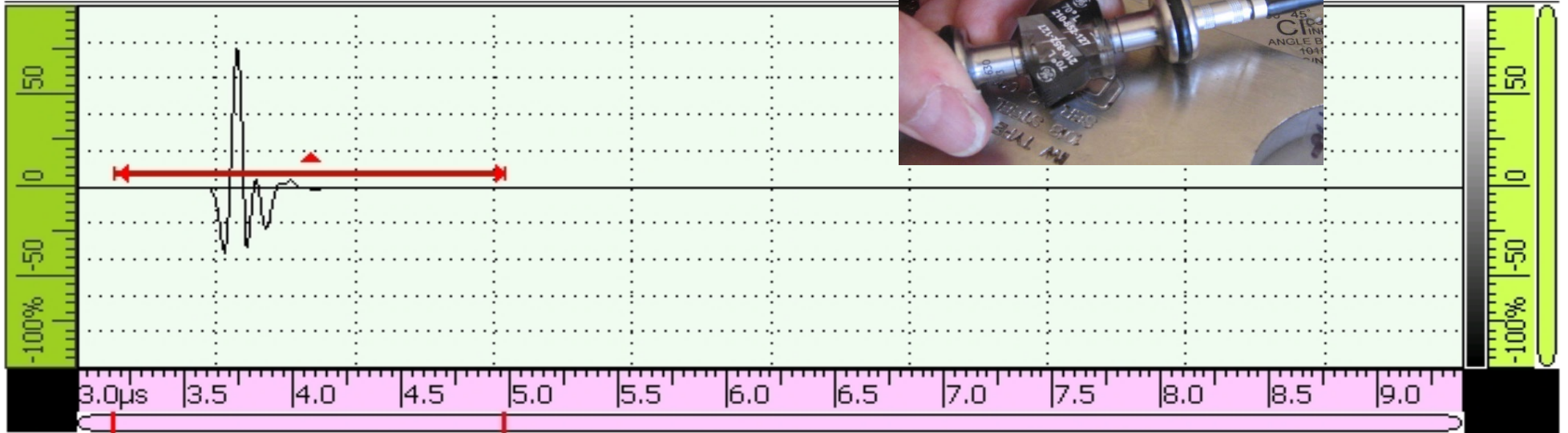
**10.0
MHz**

set-up photo:

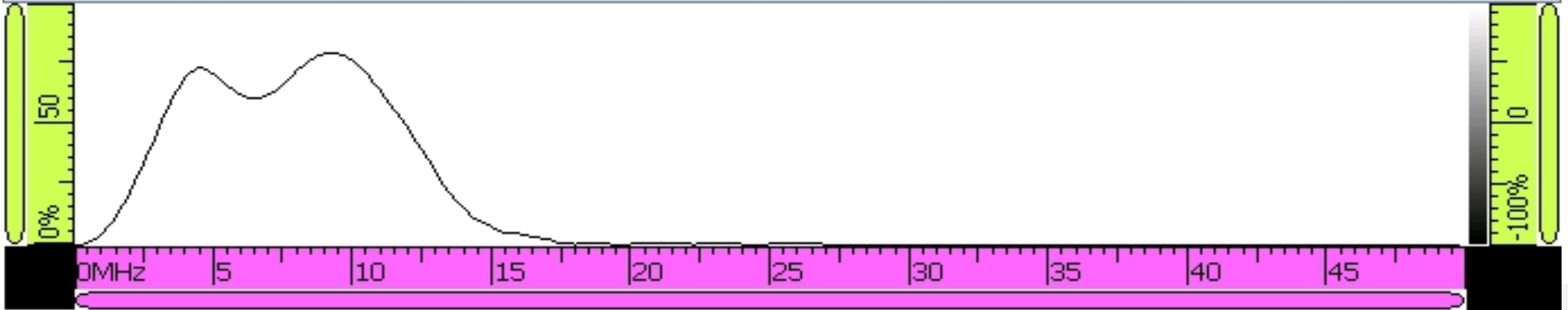


gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:
-6 dB	2.54 MHz	12.50 MHz	7.52 MHz	9.96 MHz	132.47 %	9.18 MHz
-20 dB	1.17 MHz	15.04 MHz	8.11 MHz	13.87 MHz	171.08 %	



Mode: **PITCH-CATCH**
 material 0.355" PMMA/PMMA
 "Save Image" as: File0071.jpg
 "Report Preview" as: File0071.htm
 Excel tab: 61

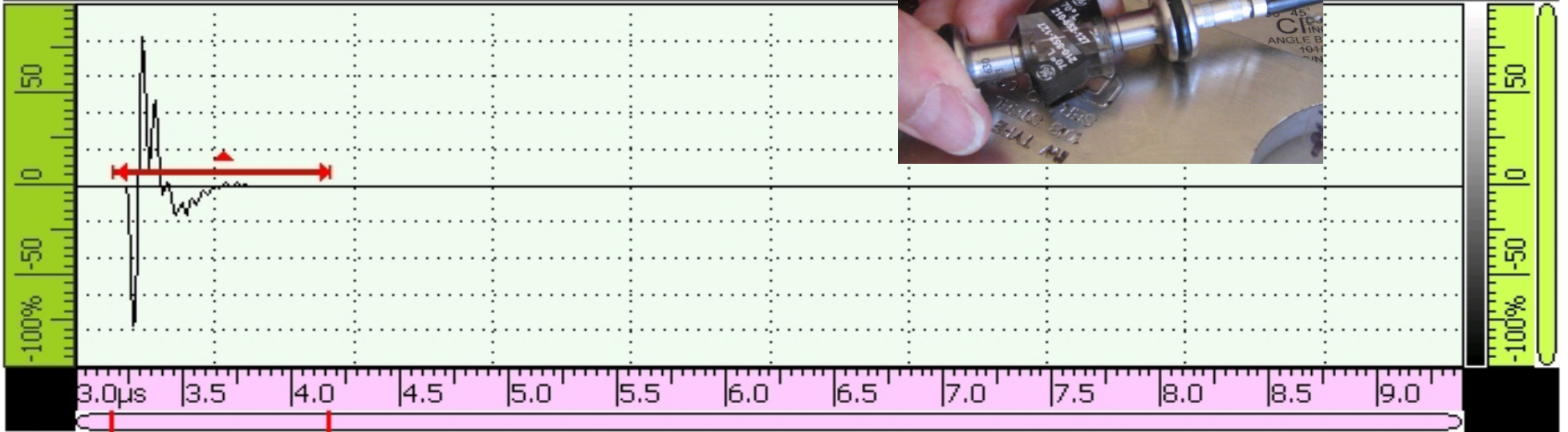
**15.0
MHz**

set-up photo:



gate
threshold:

7%



FFT	Lower	Higher	Center	Bandwidth	Bandwidth	Max.:	3.52 MHz
-6 dB	1.56 MHz	18.36 MHz	9.96 MHz	16.80 MHz	168.63 %		
-20 dB	0.78 MHz	22.07 MHz	11.43 MHz	21.29 MHz	186.32 %		

