



*Transducers For Ultrasonic
Non-Destructive Testing*

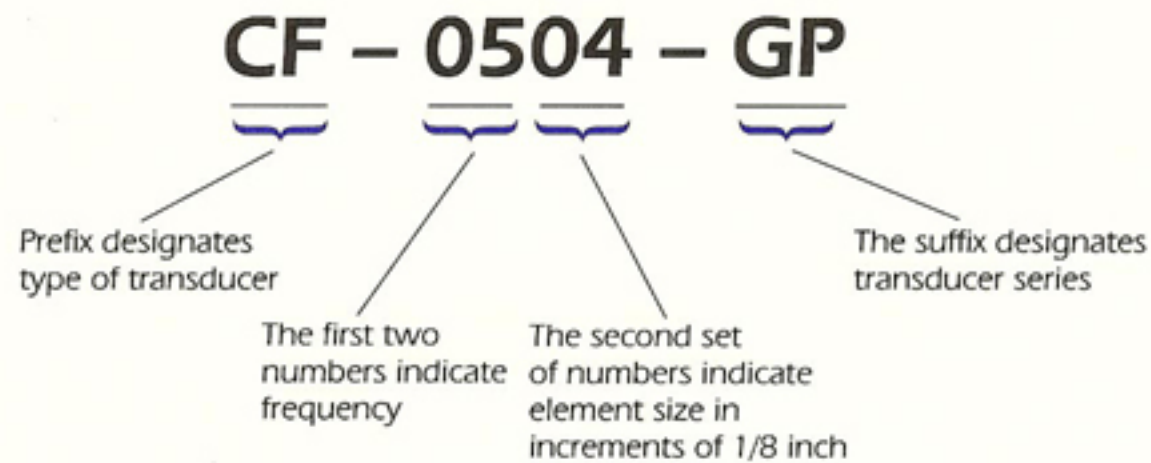


Table of Contents

	Page
Technical Information.	3
Contact Transducers.	4
Protective Face Transducers.	5
Angle Beam Transducers.	6-9
Delay Line Transducers.	10
Dual Element Transducers.	11-12
Immersion Transducers.	13-15
Cables, Search Tubes & Adaptors.	16
Test Blocks.	17
Transducer Certification.	18
Specials.	19-20
Useful Information.	21-22

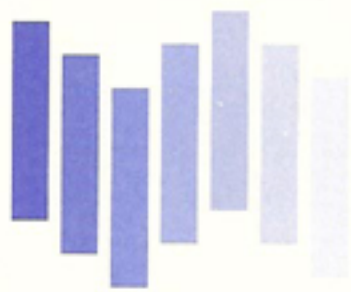
Transducer Identification

Technisonic's color code and part numbering system make our transducers easy to identify.



Technisonic Frequency Color Codes

MHz	.50	1.0	2.25	3.5	5.0	10.0	15.0	20.0	25.0
Color	Silver	Brown	Red	Orange	Green	Black	Blue	Gold	Purple



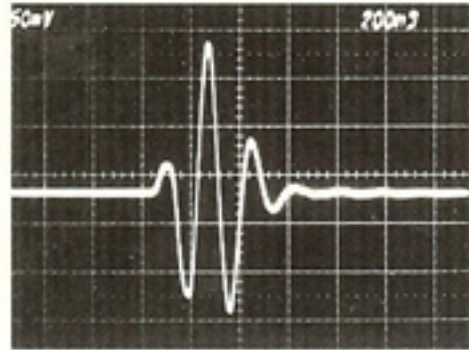
Technical Information

Technisonic Research manufactures six series of standard transducers: General Purpose (GP); High Resolution (HR); Super High Resolution (SHR); Very High Resolution (VHR);

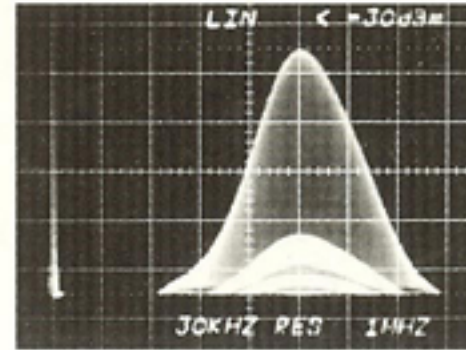
Composite (CMP) and Super Punch (SP). Please refer to the information below to determine which series is best suited for your application. If in doubt, please call for assistance.

General Purpose Series (GP)

The General Purpose Series is recommended for the majority of pulse-echo applications. Typically having two to three full ring cycles, they offer the best combination of gain and

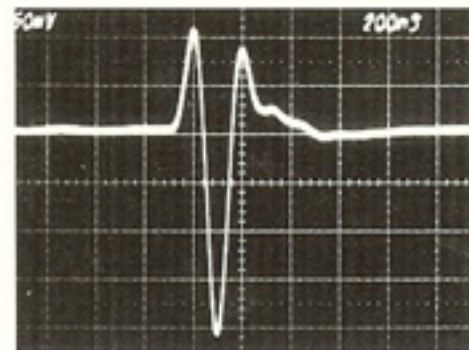


resolution. These transducers are tuned to provide the best balance between gain and resolution for general purpose testing, with a bandwidth of 30 to 60 percent at -6 dB.

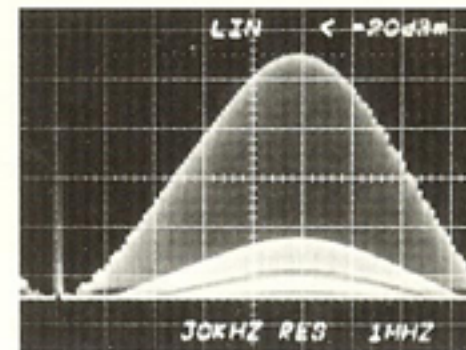


High Resolution Series (HR)

The High Resolution Series are broadbanded transducers, making them an excellent choice for thickness gaging applications. While gain is somewhat lower than the



General Purpose Series, they are damped to the limits of current technology, exhibiting one or two ring cycles with a bandwidth of 60 to 100 percent at -6 dB.



Very High Resolution Series (VHR)

For applications requiring detection of small, near-surface defects, the VHR Series is recommended. This series offers increased sensitivity while maintaining the high-damped

characteristics of the HR Series. Typical bandwidth is 50 to 100 percent at -6 dB.

Super High Resolution Series (SHR)

Technisonic has developed the Super High Resolution Series of immersion transducers to satisfy the requirements of General Electric, Pratt & Whitney, ALCOA, Rolls Royce,

Northrop, McDonnell Douglas, etc. These are highly specialized transducers primarily designed for the detection of small, near-surface defects.

Super Punch Series (SP)

The Super Punch Series provides maximum gain for penetration of highly attenuative or very thick materials. They have little or no damping and a tuning network coupled with piezoelectric crystals designed for very high

output. These narrow band transducers have less resolution than the General Purpose Series. Typical bandwidth is 20 to 40 percent at -6 dB.

Composite Series (CMP)

This series features a piezocomposite element which results in transducers with greater sensitivity, increased signal-to-noise ratio, deeper penetration and better resolution in

highly attenuative materials. Typical bandwidths range from 50 to 100 percent at -6 dB.



Contact Transducers

Technisonic offers a complete line of **Standard and Fingertip Contact Transducers**. These transducers are compatible with all commercially available flaw detectors and some thickness gauges. Surface knurling ensures a very comfortable non-slip grip and color coded caps make them readily identifiable.

The **General Purpose (GP) Series**, offers the best combina-

tion of sensitivity and resolution for the majority of contact flaw detection applications.

The **High Resolution (HR) Series**, is designed for optimum resolution and maximum bandwidth. They can be used on all flaw detectors and certain thickness gauges.

Technisonic **Standard Contact Transducers (C)** are used when accessibility to the test area presents no problem. Each features a stainless steel housing with an acoustically matched alumina wearface surrounded by a hardened steel wear ring. This insures optimum sound transmission, rugged dependability and excellent resistance to abrasive surfaces.

Standard Contacts (C)

Frequency (MHz)	Element Diameter			
	.500"	.750"	1.00"	1.125"

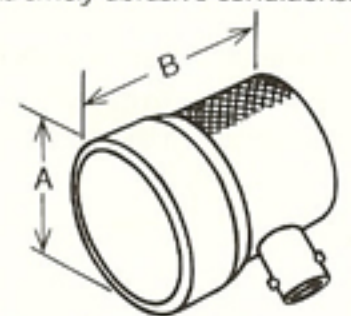
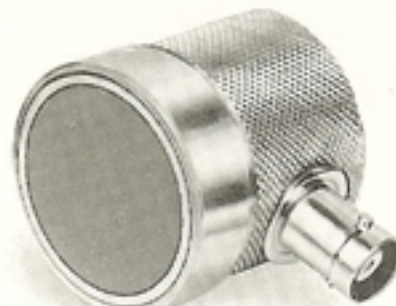
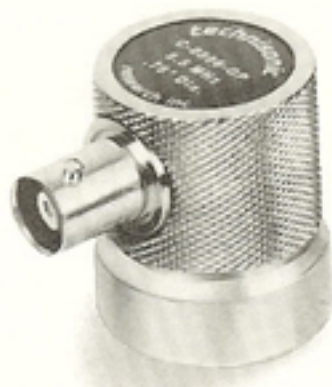
General Purpose Series (GP)

0.5	—	C-0006-GP	C-0008-GP	C-0009-GP
1.0	C-0104-GP	C-0106-GP	C-0108-GP	C-0109-GP
2.25	C-0204-GP	C-0206-GP	C-0208-GP	C-0209-GP
3.5	C-0304-GP	C-0306-GP	C-0308-GP	—
5.0	C-0504-GP	C-0506-GP	C-0508-GP	—

High Resolution Series (HR)

2.25	C-0204-HR	C-0206-HR	C-0208-HR	—
3.5	C-0304-HR	C-0306-HR	C-0308-HR	—
5.0	C-0504-HR	C-0506-HR	C-0508-HR	—

- Unless otherwise specified a BNC connector mounted at right angles will be supplied.
- Axial mounted connectors are also available.
- Metallic wearface is available for extremely abrasive conditions.



DIMENSIONS

Element	A	B
.500"	.81"	1.25"
.750"	1.06"	1.25"
1.00"	1.31"	1.25"
1.125"	1.44"	1.25"

Technisonic **Fingertip Contact Transducers (CF)** are best suited for limited access areas or when higher frequencies and smaller diameters are desired. These transducers feature rugged construction in a stainless steel housing for excellent resistance to abrasive surfaces. They also have an acoustically matched alumina wearface for optimum performance and excellent durability. A side mounted microdot connector is supplied.

Fingertip Contacts (CF)

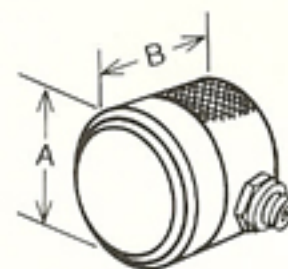
Frequency (MHz)	Element Diameter				
	.125"	.250"	.375"	.500"	.750"

General Purpose Series (GP)

1.0	—	—	—	CF-0104-GP	CF-0106-GP
2.25	—	CF-0202-GP	CF-0203-GP	CF-0204-GP	CF-0206-GP
3.5	—	CF-0302-GP	CF-0303-GP	CF-0304-GP	CF-0306-GP
5.0	—	CF-0502-GP	CF-0503-GP	CF-0504-GP	CF-0506-GP
10.0	—	CF-1002-GP	CF-1003-GP	CF-1004-GP	—

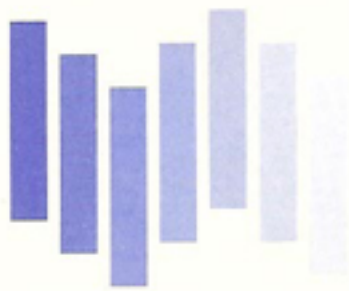
High Resolution Series (HR)

2.25	—	CF-0202-HR	CF-0203-HR	CF-0204-HR	CF-0206-HR
3.5	—	CF-0302-HR	CF-0303-HR	CF-0304-HR	CF-0306-HR
5.0	CF-0501-HR	CF-0502-HR	CF-0503-HR	CF-0504-HR	CF-0506-HR
10.0	CF-1001-HR	CF-1002-HR	CF-1003-HR	CF-1004-HR	—



DIMENSIONS

Element	A	B
.125"	.26"	.40"
.250"	.46"	.60"
.375"	.59"	.60"
.500"	.72"	.60"
.750"	1.00"	.63"



Protective Face Transducers

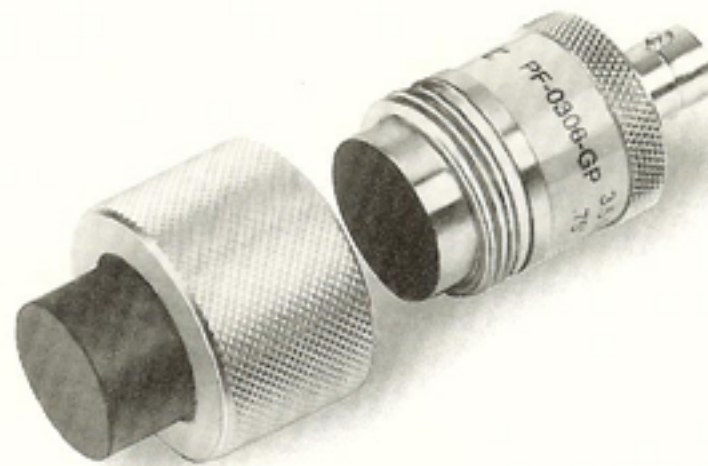
Technisonic's **Protective Face Transducers (PF)** are designed to be used with three different types of protective face options complimenting a wide variety of testing applications. Each transducer comes with a Protective Membrane Kit and addition-

al accessories can be ordered separately. The basic transducer supplied is a general purpose series and has a top mounted BNC connector. Color coded labels make these transducers easy to identify.

Protective Membranes (PM) are commonly used to maintain better surface contact between the transducer and curved, rough, or irregularly shaped surfaces. Spare membranes can be ordered by the dozen.

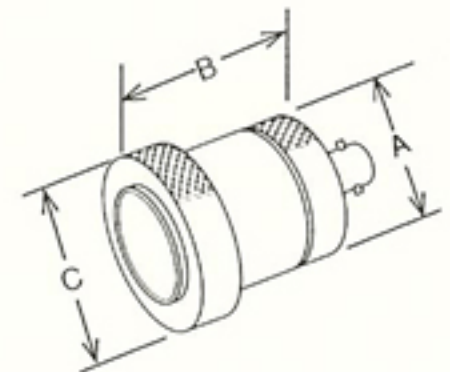
Protective High Temperature Delay Lines (PD) are used for testing hot surfaces up to 550°F. Technisonic's newest high temperature material, "Technitherm", reduces signal drift caused by temperature variations and improves sensitivity. One Delay Ring per transducer is also required to use this option. Standard delays are one inch long, but longer lengths and delays suitable for higher temperatures are available.

Protective Wear Caps (PC) are expendable wear caps which protect the transducer from damage when inspecting extremely rough or abrasive surfaces.



Frequency (MHz)	Element Diameter			
	.500"	.750"	1.00"	1.125"
General Purpose Series (GP)				
0.5	—	PF-0006-GP	PF-0008-GP	PF-0009-GP
1.0	PF-0104-GP	PF-0106-GP	PF-0108-GP	PF-0109-GP
2.25	PF-0204-GP	PF-0206-GP	PF-0208-GP	PF-0209-GP
3.5	PF-0304-GP	PF-0306-GP	PF-0308-GP	—
5.0	PF-0504-GP	PF-0506-GP	PF-0508-GP	—

Option	Element Diameter			
	.500"	.750"	1.00"	1.125"
Membranes (Doz)	PM-12-04	PM-12-06	PM-12-08	PM-12-09
Wearcaps	PC-04	PC-06	PC-08	PC-09
Wearcaps (Doz)	PC-12-04	PC-12-06	PC-12-08	PC-12-09
High Temp Delays	PD-04	PD-06	PD-08	PD-09
Delay Rings	PDR-04	PDR-06	PDR-08	PDR-09

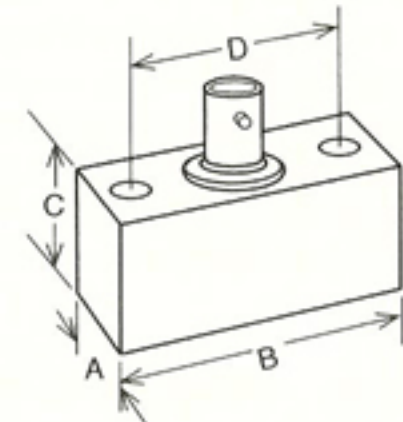


DIMENSIONS			
Element	A	B	C
.50"	.75"	1.25"	.91"
.75"	1.00"	1.25"	1.25"
1.00"	1.38"	1.35"	1.50"
1.125"	1.38"	1.35"	1.5"



Standard Angle Beam Transducers and Wedges

Technisonic Research offers a complete line of **Angle Beam Transducers (ABS)** compatible with all commercially available flaw detectors. These are longitudinal wave transducers which can generate shear waves when coupled to a Technisonic wedge. They are primarily used for weld inspection or flaw detection of defects with favorable orientation. Technisonic's angle beam transducers are constructed within stainless steel housings for durability and rugged dependability. An acoustically matched epoxy lens insures optimum performance and color coded labels make them easy to identify. These transducers, when coupled to Technisonic wedges, provide excellent gain and signal/noise ratios. Supplied with a BNC connector, other connectors are available on special order. Technisonic also manufactures a line of **AWS Structural Welding Code Transducers** which meet or exceed all the requirements of D1.1 when used with Technisonic AWS Wedges.



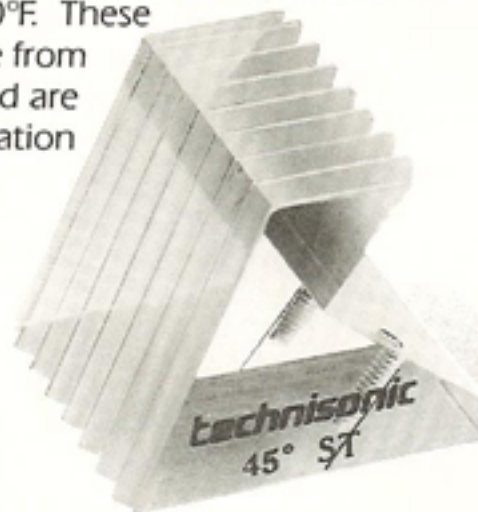
Frequency (MHz)	Element Size			
	.50" Dia.	.50" x 1.0"	.75" x 1.0"	1.0" Dia.
General Purpose Series (GP)				
0.5				ABS-0008-GP
1.0	ABS-0104-GP	ABS-010408-GP	ABS-010608-GP	ABS-0108-GP
2.25	ABS-0204-GP	ABS-020408-GP	ABS-020608-GP	ABS-0208-GP
3.5	ABS-0304-GP	ABS-030408-GP	ABS-030608-GP	ABS-0308-GP
5.0	ABS-0504-GP	ABS-050408-GP	ABS-050608-GP	ABS-0508-GP

Transducers for AWS Structural Welding Code D1.1			
	.625" x .625"	.625" x .750"	.750" x .750"
2.25	ABS-020505-AWS	ABS-020506-AWS	ABS-020606-AWS

DIMENSIONS

	.50" Dia.	.50" x 1.0"	1.0" Dia.	.75" x 1.0"	AWS
A	.75"	.75"	1.25"	1.00"	.87"
B	1.00"	1.62"	1.65"	1.56"	1.25"
C	.70"	.70"	.73"	.73"	.75"
D	.81"	1.31"	1.38"	1.31"	1.00"

Technisonic Research offers standard replacement wedges in three basic styles. Style **WSR (Serrated Wedge)** is used for standard angle beam transducers and offers excellent signal/noise ratios. Style **AWS Wedges** are "Snail" Wedges specifically designed for our AWS transducers and display optimum signal/noise ratios. Finally, our style **WHT (High Temperature Wedge)** is best suited for elevated temperatures up to 550°F. These high temperature wedges are made from a material we call "Technitherm" and are designed to reduce drift and attenuation as compared to other materials. Intermittent use at elevated temperatures is recommended to avoid transducer overheating.



Transducer Size	Effective Angle (Steel)			
	45°	60°	70°	90°
Serrated Wedge 200°F				
.5" Dia.	WSR-04-45	WSR-04-60	WSR-04-70	WSR-04-90
.5" x 1.0"	WSR-0408-45	WSR-0408-60	WSR-0408-70	WSR-0408-90
.75" x 1"	WSR-0608-45	WSR-0608-60	WSR-0608-70	WSR-0608-90
1.0" Dia.	WSR-08-45	WSR-08-60	WSR-08-70	WSR-08-90
High Temperature Wedge - WHT 550°F				
.5" Dia.	WHT-04-45	WHT-04-60	WHT-04-70	—
.5" x 1.0"	WHT-0408-45	WHT-0408-60	WHT-0408-70	—
.75" x 1"	WHT-0608-45	WHT-0608-60	WHT-0608-70	—
1.0" Dia.	WHT-08-45	WHT-08-60	WHT-08-70	—
Wedges for AWS Welding Code D1.1 200°F				
.625" x .625"	WSN-AWS-45	WSN-AWS-60	WSN-AWS-70	—
.625" x .750"	WSN-AWS-45	WSN-AWS-60	WSN-AWS-70	—
.750" x .750"	WSN-AWS-45	WSN-AWS-60	WSN-AWS-70	—

- Screw holes have a 6-32 thread, 4-40 is available.
- Special angles and curvatures are available on special order.
- Wedges designed for temperatures above 550°F are also available.
- Cooling cycle: Allow transducer to cool to ambient temperature after 30 seconds @ 400°F.



Fingertip Angle Beam Transducers and Wedges

Technisonic offers **Fingertip Removable Angle Beam Quick Change Transducers (ABFQ)** in two series: General Purpose (GP) and Composite (CMP). Their chief application is the inspection of welds for flaws with suitable orientation. They are useable on all commercially available flaw detectors. Their small size is ideal for inspection in limited access areas, on curved surfaces or for reducing the approach distance to the test area. The GP series is recommended for the majority of testing. For hard-to-penetrate materials such as austenitics, composites, plastics, etc., the CMP series provides greater sensitivity, increased signal-to-noise ratio, deeper penetration and better resolution when used with Technisonic wedges (WFO). The threaded transducer body screws directly into the wedge, making wedge changes fast and easy. This design insures positive coupling between the transducer and wedge. Color coded labels identify the frequency of the transducer. A microdot connector is supplied.

Technisonic's **Quick Change Wedges (WFO)** are designed to get maximum sound energy into the test material while dissipating internal reflections into a highly attenuative material that is built into every Quick Change Wedge.

Frequency (MHz)	.250"	.375"	.500"
-----------------	-------	-------	-------

General Purpose Series (GP)

1.0	—————	—————	ABFQ-0104-GP
2.25	ABFQ-0202-GP	ABFQ-0203-GP	ABFQ-0204-GP
3.5	ABFQ-0302-GP	ABFQ-0303-GP	ABFQ-0304-GP
5.0	ABFQ-0502-GP	ABFQ-0503-GP	ABFQ-0504-GP
10.0	ABFQ-1002-GP	ABFQ-1003-GP	ABFQ-1004-GP

Composite Series (CMP)

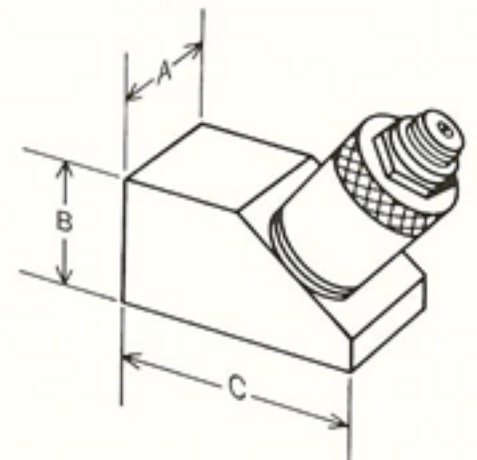
1.0	—————	—————	ABFQ-0104-CMP
1.5	—————	ABFQ-1.503-CMP	ABFQ-1.504-CMP
2.25	ABFQ-0202-CMP	ABFQ-0203-CMP	ABFQ-0204-CMP
3.5	ABFQ-0302-CMP	ABFQ-0303-CMP	ABFQ-0304-CMP
5.0	ABFQ-0502-CMP	ABFQ-0503-CMP	ABFQ-0504-CMP

Fingertip Wedges

Wedge Style	Element Dia.	Effective angle in steel*			
		45°	60°	70°	90°
WFO	.250"	WFO-02-45	WFO-02-60	WFO-02-70	WFO-02-90
WFO	.375"	WFO-03-45	WFO-03-60	WFO-03-70	WFO-03-90
WFO	.500"	WFO-04-45	WFO-04-60	WFO-04-70	WFO-04-90

*Refracted angle as measured @ 5MHz.

- Special angles or curved wedges available upon request.
- Wedges with short exit points (WFOSE) available on request.
- High temperature wedges available upon request.



DIMENSIONS 1/4"

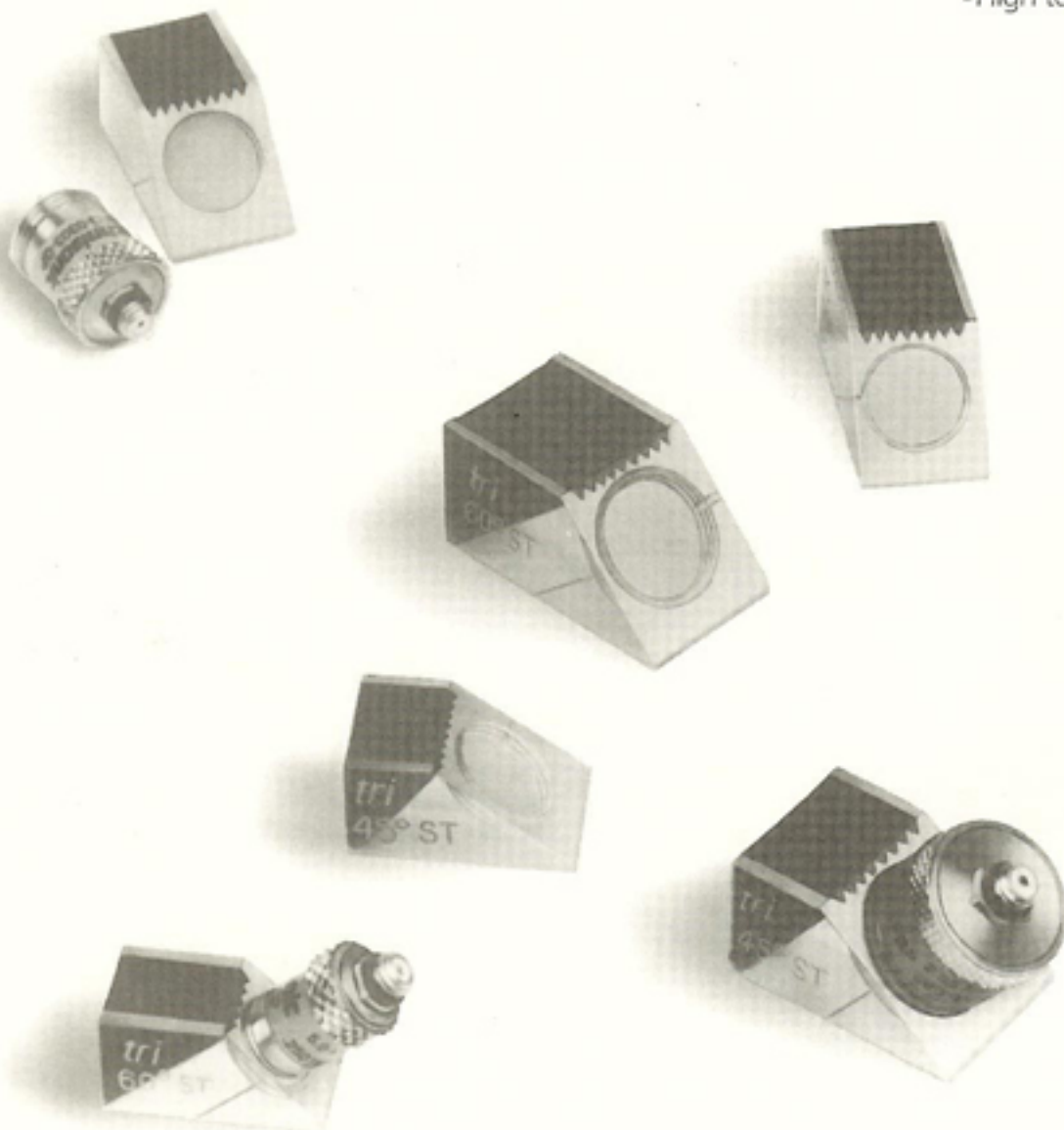
Angle	A	B	C
45°	.45"	.42"	.80"
60°	.45"	.47"	.90"
70°	.45"	.48"	1.00"
90°	.45"	.50"	.95"

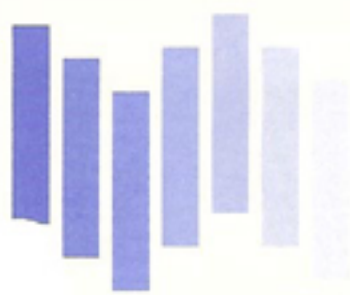
DIMENSIONS 3/8"

45°	.60"	.51"	.97"
60°	.60"	.57"	1.14"
70°	.60"	.60"	1.25"
90°	.60"	.70"	1.15"

DIMENSIONS 1/2"

45°	.75"	.58"	1.15"
60°	.75"	.68"	1.35"
70°	.75"	.71"	1.45"
90°	.75"	.75"	1.39"





Fingertip Angle Beam Transducers and Wedges

Technisonic Research offers **Fingertip Removable Angle Beam Transducers (ABFR)** in two series: General Purpose (GP) and Composite (CMP). Their chief application is for weld inspection or flaw detection of suitably oriented flaws. They are useable on all commercially available flaw detectors. They are designed for the inspection of limited access areas, on curved surfaces and for reducing the approach distance to the test area. The GP series is recommended for the majority of testing. For hard-to-penetrate materials such as austenitics, composites, plastics, etc., the CMP series provides greater sensitivity, increased signal-to-noise ratio, deeper penetration and better resolution when used with Technisonic wedges (WF). These transducers feature a captive screw design, eliminating the problem of lost screws. Stainless steel housings provide rugged dependability. They also feature an acoustically matched epoxy lens to insure optimum performance. A knurled surface provides a very comfortable non-slip grip. Color coded labels identify the frequency of the transducer. A microdot connector is supplied.

Technisonic's **Fingertip Removable Wedges (WF)** are designed to get maximum sound energy into the test material while dissipating internal reflections into a highly attenuative material that is built into every Fingertip Removable Wedge.

Frequency (MHz)	Element Diameter	
	.250"	.500"

General Purpose Series (GP)

1.0	—————	ABFR-0104-GP
2.25	ABFR-0202-GP	ABFR-0204-GP
3.5	ABFR-0302-GP	ABFR-0304-GP
5.0	ABFR-0502-GP	ABFR-0504-GP
10.0	ABFR-1002-GP	ABFR-1004-GP

Composite Series (CMP)

1.0	—————	ABFR-0104-CMP
2.25	ABFR-0202-CMP	ABFR-0204-CMP
3.5	ABFR-0302-CMP	ABFR-0304-CMP
5.0	ABFR-0502-CMP	ABFR-0504-CMP

Wedge Style	Element Dia.	Effective angle in steel*			
		45°	60°	70°	90°

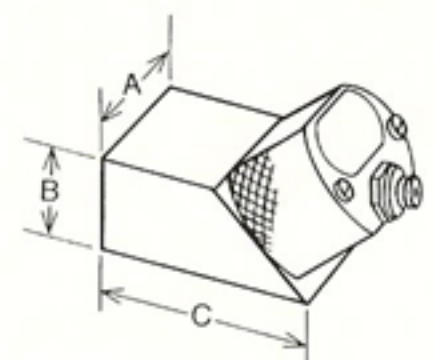
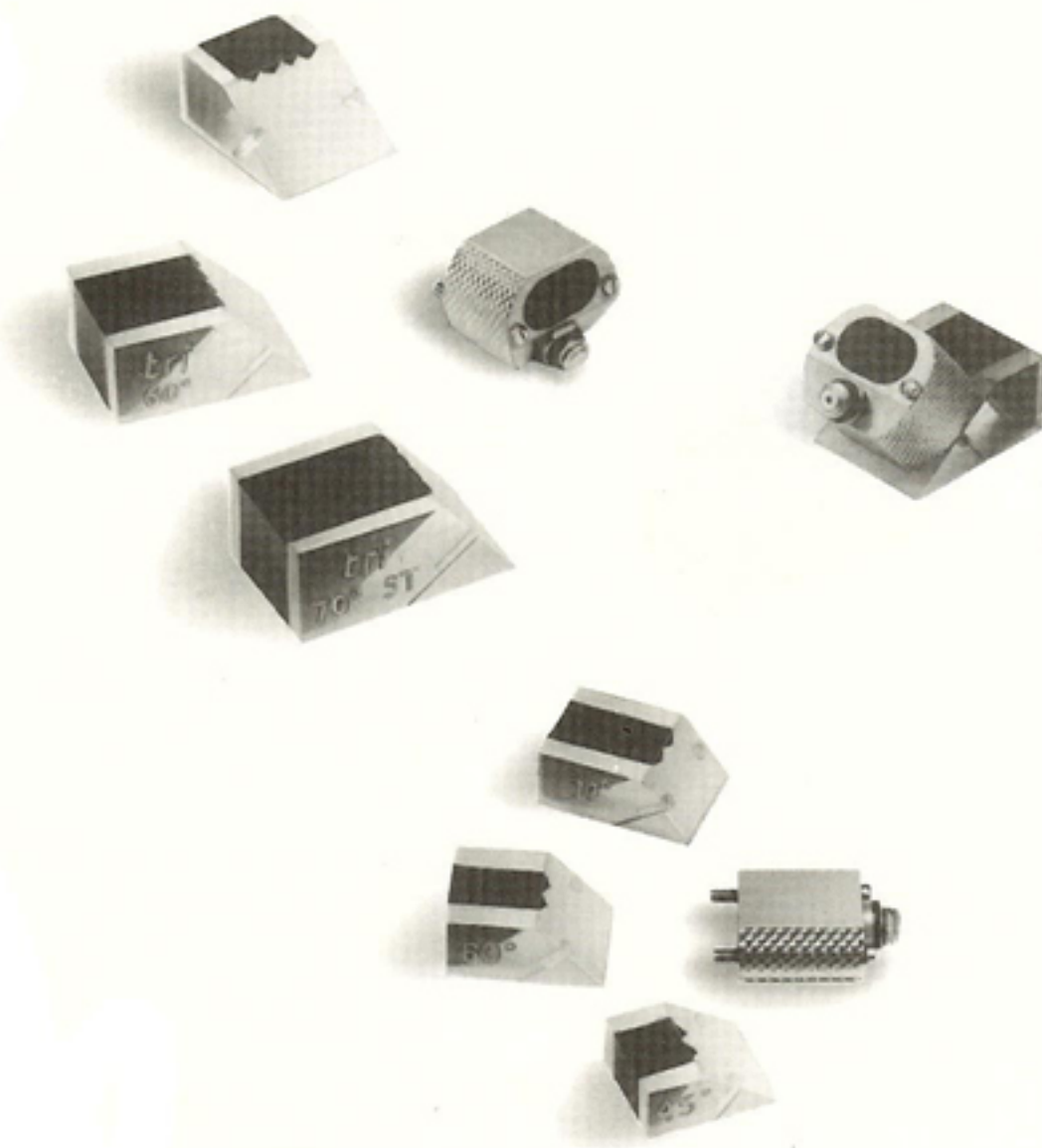
Fingertip Wedges

WF	.250"	WF-02-45	WF-02-60	WF-02-70	WF-02-90
WF	.500"	WF-04-45	WF-04-60	WF-04-70	WF-04-90

Fingertip Wedges (High Temperature) 550° F

WFHT	.250"	WFHT-02-45	WFHT-02-60	WFHT-02-70	—————
WFHT	.500"	WFHT-04-45	WFHT-04-60	WFHT-04-70	—————

- Special angles or curved wedges available upon request.
- Cooling Cycle: Allow transducer to cool to ambient temperature after 10 seconds of contact time @ 350° F.
- * Refracted angle as measured @ 5MHz.



DIMENSIONS 1/4"			
Angle	A	B	C
45°	.50"	.27"	.60"
60°	.50"	.32"	.69"
70°	.50"	.33"	.75"
90°	.50"	.50"	.90"

DIMENSIONS 1/2"			
Angle	A	B	C
45°	.75"	.45"	.95"
60°	.75"	.50"	1.05"
70°	.75"	.53"	1.17"
90°	.75"	.76"	1.56"



Fingertip Angle Beam Transducers

Technisonic's **Fingertip Potted Angle Beam Transducers (ABFP)** are best suited for the inspection of limited access areas with all commercially available flaw detectors. The integral wedge design insures excellent signal/noise ratios and their small size allows testing of slightly curved or irregularly shaped surfaces. Rear mounted microdot connectors are standard but top mounted microdots are available.

Technisonic's **Microminiature Angle Beam Transducers (MMAB)** are ideal for testing situations where access to the area of interest is extremely limited. A top mounted microdot connector is normally supplied but rear mounted connectors are available on special order.

ABFP				
Frequency (MHz)	Effective Angle in Steel			
	45°	60°	70°	90°

Element Dimensions: .250" x .250"

2.25	ABFP-0202-45	ABFP-0202-60	ABFP-0202-70	ABFP-0202-90
5.0	ABFP-0502-45	ABFP-0502-60	ABFP-0502-70	ABFP-0502-90
10.0	ABFP-1002-45	ABFP-1002-60	ABFP-1002-70	ABFP-1002-90

Element Dimensions: .375" x .375"

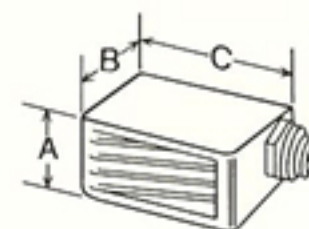
2.25	ABFP-0203-45	ABFP-0203-60	ABFP-0203-70	ABFP-0203-90
5.0	ABFP-0503-45	ABFP-0503-60	ABFP-0503-70	ABFP-0503-90
10.0	ABFP-1003-45	ABFP-1003-60	ABFP-1003-70	ABFP-1003-90

• ABFP Series is available with composite element on request.

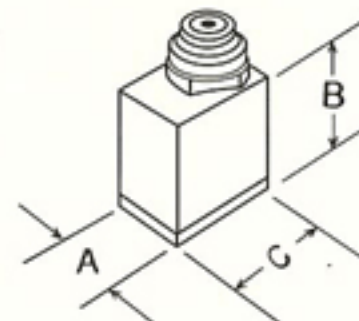
MMAB				
Frequency (MHz)	Effective Angle in Steel			
	45°	60°	70°	90°

Element Dimensions: .187" x .187"

5.0	MMAB-0501-45	MMAB-0501-60	MMAB-0501-70	MMAB-0501-90
10.0	MMAB-1001-45	MMAB-1001-60	MMAB-1001-70	MMAB-1001-90



Element Size	Dimensions		
	A	B	C
.25" sq.	.36"	.60"	.74"
.37" sq.	.49"	.60"	1.00"



Dimensions		
A	B	C
.25"	.37"	.37"



Delay Line Transducers

Technisonic **Delay Line Transducers** are offered in our High Resolution Series. These transducers are damped to the current limits of technology and have maximum bandwidth. They are recommended for thickness measurements or flaw detection of very thin materials on commercially available flaw detectors and some thickness gauges. The small case design permits

access into restricted areas and is ideal for wall measurements on small diameter tubing. Delay Line transducers are available in both permanent and replaceable delays offering greater flexibility. These transducers have a knurled exterior for a comfortable non-slip grip and color coded caps for easy identification. A side mounted microdot connector is supplied.

Delay Line transducers are available in three models.

The **Standard (GRD)** is recommended for most applications and is available in two sizes. The most popular GRD has a .25" diameter element coupled with a .35" long replaceable delay. A .50" diameter element with a .50" long replaceable delay is also available.

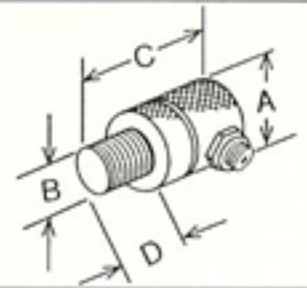
The **Miniature (MRD)** has an element diameter of .125". This transducer is ideal for restricted areas and is supplied with a .5" long replaceable delay.

The **Permanent Delay (GD)** version has an element diameter of .25" with a .35" long delay. This version has a delay built into the housing, eliminating the need for adding couplant and changing delays.

	GRD	GRD	MRD	GD
Frequency (MHz)	.250"	.500"	.125"	.250"
	Element Diameter			
High Resolution Series (HR)				
2.25	GRD-0202-HR	GRD-0204-HR	—	—
3.5	GRD-0302-HR	GRD-0304-HR	—	—
5.0	GRD-0502-HR	GRD-0504-HR	—	GD-0502-HR
10.0	GRD-1002-HR	GRD-1004-HR	—	GD-1002-HR
15.0	GRD-1502-HR	—	MRD-1501-HR	GD-1502-HR
20.0	GRD-2002-HR	—	MRD-2001-HR	GD-2002-HR
25.0	GRD-2502-HR	—	MRD-2501-HR	GD-2502-HR

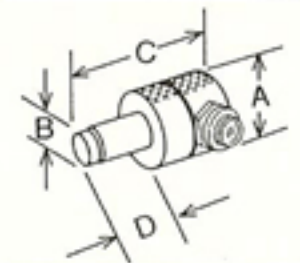
Accessories for the Replaceable Delay Line Transducer

GRD Spring Loaded Case (1/4" dia. only)	GRD-SL
GRD .25" dia. Replaceable Delay (1 pc.)	GRD-.25-D
GRD .25" dia. Replaceable Delay (10 pc.)	GRD-.25-D10
GRD .50" dia. Replaceable Delay (1 pc.)	GRD-.50-D
GRD .50" dia. Replaceable Delay (10 pc.)	GRD-.50-D10
MRD Replaceable Delay (1 pc.)	MRD-D
MRD Replaceable Delay (10 pc.)	MRD-D10



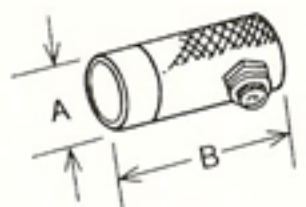
DIMENSIONS (GRD)

Element	A	B	C	D
.25"	.50"	.29"	.89"	.27"
.50"	.69"	.55"	1.12"	.41"



DIMENSIONS (MRD)

A	B	C	D
.45"	.22"	.88"	.40"



DIMENSIONS (GD)

A	B
.39"	.75"

Dual Element Transducers

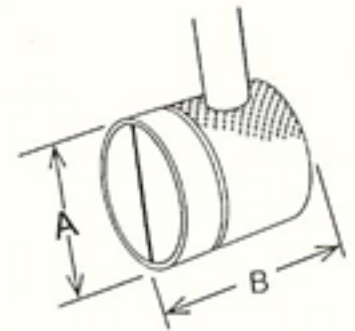
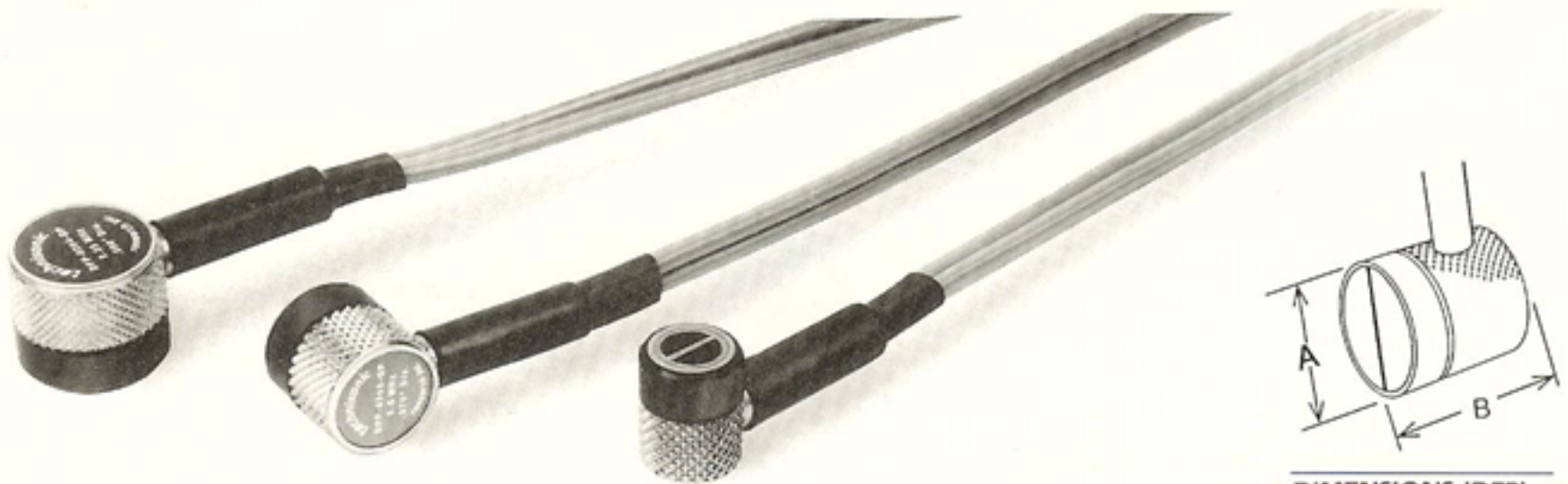
Technisonic's **Dual Element Fingertip Transducers** are designed for the detection of near surface discontinuities and thin wall sections. Each transducer is actually two transducers constructed within a single housing, each side electrically and acoustically isolated from each other. Their small size makes them ideally suited for limited access areas or small

diameter pipe inspection. They are designed to provide optimum performance on all commercially available flaw detectors and certain thickness gauges. Constructed within stainless steel housings with surface knurling, these transducers are very durable and provide a comfortable non-slip grip. Color coded caps make these transducers readily identifiable.

Dual Fingertip Potted Transducers (DFP) are provided with an integral six foot long cable terminated with BNC connectors. This model is our most popular due to its size flexibility and lower cost. Special configurations or curved delays for pipe inspection are also available.

Dual Fingertip Potted (DFP)

Frequency (MHz)	Element Diameter		
	.250"	.375"	.500"
1.0	—	—	DFP-0104-GP
2.25	DFP-0202-GP	DFP-0203-GP	DFP-0204-GP
3.5	DFP-0302-GP	DFP-0303-GP	DFP-0304-GP
5.0	DFP-0502-GP	DFP-0503-GP	DFP-0504-GP
10.0	DFP-1002-GP	DFP-1003-GP	DFP-1004-GP



DIMENSIONS (DFP)

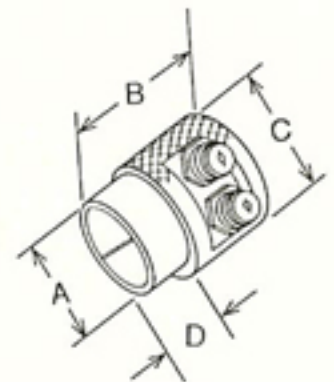
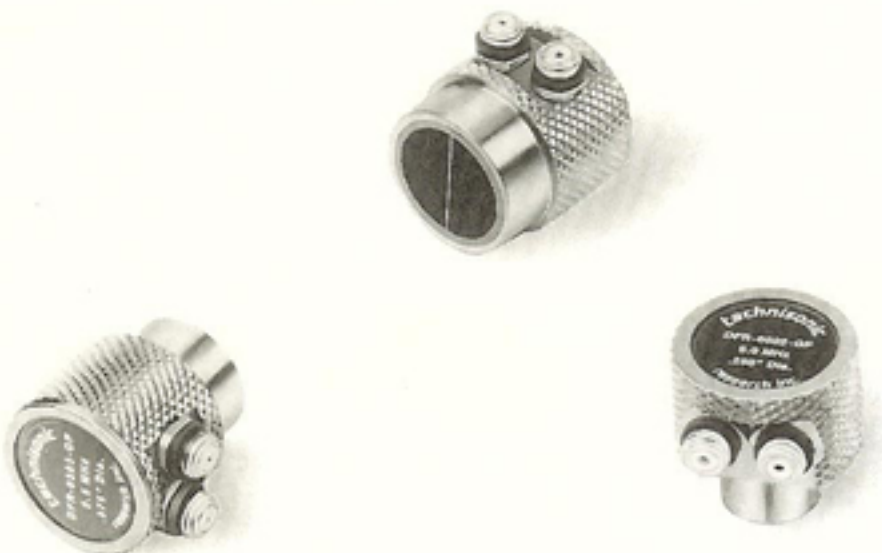
Element	A	B
.250"	.46"	.60"
.375"	.59"	.60"
.500"	.72"	.60"

DFP series is available with composite element on request.

Dual Fingertip Removable Transducers (DFR) are supplied with standard microdot connectors to allow for simple field replacement of a damaged cable. The most common cable for this transducer line is our dual microdot to BNC (DMB-6) which is six (6) feet long and must be ordered separately. Special configurations or curved delays are available.

Dual Fingertip Removable (DFR)

Frequency (MHz)	Element Diameter		
	.250"	.375"	.500"
1.0	—	—	DFR-0104-GP
2.25	DFR-0202-GP	DFR-0203-GP	DFR-0204-GP
3.5	DFR-0302-GP	DFR-0303-GP	DFR-0304-GP
5.0	DFR-0502-GP	DFR-0503-GP	DFR-0504-GP
10.0	DFR-1002-GP	DFR-1003-GP	DFR-1004-GP



DIMENSIONS (DFR)

Element	A	B	C	D
.250"	.38"	.73"	.69"	.25"
.375"	.52"	.75"	.69"	.25"
.500"	.66"	.75"	.75"	.25"

DFR series is available with composite element on request.

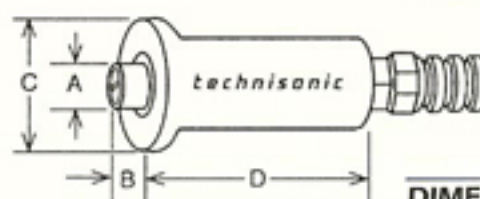
Dual Element Transducers

Technisonic offers a complete line of **Dual Element Transducers** suitable for inspection of materials at ambient or high temperature. These transducers are designed for the detection of near surface discontinuities or thin wall sections. Each transducer is actually two transducers constructed within

a single stainless steel housing, electrically and acoustically isolated from each other. Each half is angled toward the other with one side acting as the transmitter and the other the receiver. This produces a better signal/noise ratio than can be achieved by single element transducers.

The **Removable Bell Housing Transducer (DRB)** is offered in both ambient and high temperature styles which operate up to 550°F. This transducer is designed to operate on all commercially available flaw detectors and can also be ordered for many digital thickness gauges. A removable bell housing is provided for operator comfort.

Cable must be ordered separately. Please be sure to order Bell Housing Cables, which include a strain relief. Refer to cable chart on page 16.



DRB .375" Diameter		
Frequency (MHz)	Ambient Temperature	High Temperature*
2.25	DRB-0203-GP	DRBHT-0203-GP
5.0	DRB-0503-GP	DRBHT-0503-GP

* Contact Time: 10 seconds @ 500°F, then cool to ambient temperature.

DIMENSIONS (DRB)				
Element	A	B	C	D
.375"	.52"	.25"	1.35"	2.40"

DHT up to 550°F*		
Frequency (MHz)	Element Diameter	
2.25	DHT-0203-500	DHT-0204-500
5.0	DHT-0503-500	DHT-0504-500

DHT up to 900°F*		
Frequency (MHz)	Element Diameter	
2.25	DHT-0203-900	DHT-0204-900
5.0	DHT-0503-900	DHT-0504-900

* Contact Time: 10 seconds @ 500°F, 5 seconds @ 900°F, then cool to ambient temperature.

DIMENSIONS (DHT)				
Element	A	B	C	D
.375"	.48"	3.00"	4.00"	.75"
.500"	.61"	3.00"	4.00"	.75"

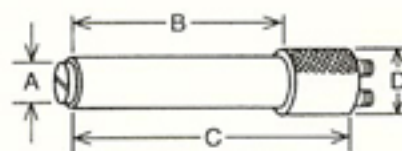
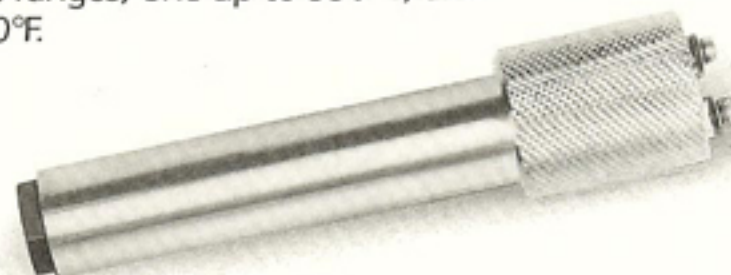
Standard Duals (DR)		
Frequency (MHz)	Element Dimensions	
1.00	DR-010404-GP	DR-010408-GP
2.25	DR-020404-GP	DR-020408-GP
5.00	DR-050404-GP	DR-050408-GP

Replacement Standard Delays		
Frequency (MHz)	Element Dimensions	
1.00	DR-D-0404	DR-D-0408
2.25	DR-D-0404	DR-D-0408
5.00	DR-D-0404	DR-D-0408-5

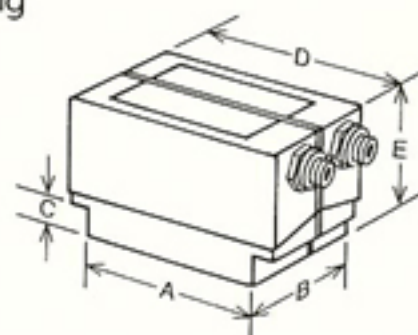
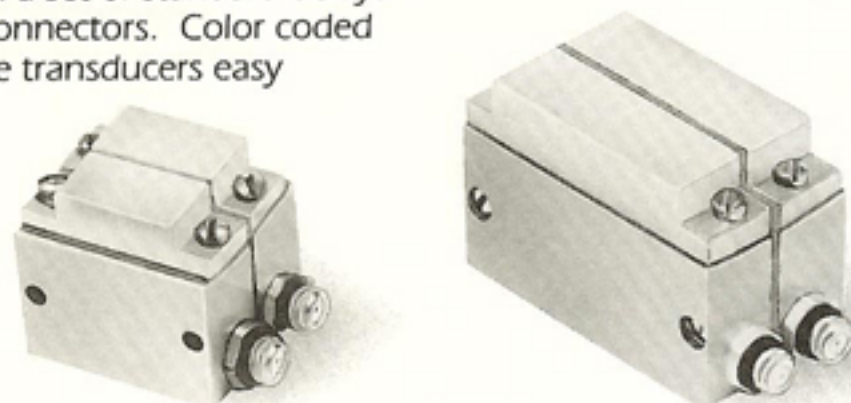
Replacement High Temperature Delays		
Frequency (MHz)	Element Dimensions	
1.00	DR-DHT-0404	DR-DHT-0408
2.25	DR-DHT-0404	DR-DHT-0408
5.00	DR-DHT-0404	DR-DHT-0408-5

DIMENSIONS (DR)					
Element	A	B	C	D	E
.5" x .5"	.52"	.70"	.20"	.80"	.85"
.5" x 1.0"	1.05"	.70"	.25"	1.50"	.99"

The **High Temperature Transducers (DHT)** are best suited for limited access areas or the inspection of insulated pipes or vessels. This transducer is designed to operate on all commercially available flaw detectors and is offered in two temperature ranges, one up to 550° F, and the other up to 900°F.



The **Removable Delay Transducers (DR)** are ideal for scanning large areas where there are no space restrictions. They have been designed with replaceable delays which allow for greater flexibility. The delays can be replaced due to wear, they can be curved for pipe inspection, or replaced with high temperature delays for testing materials up to 450° F. This transducer is provided with a set of standard delays and microdot connectors. Color coded caps make these transducers easy to identify.





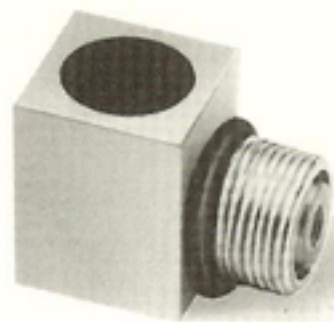
Immersion Transducers

The **Slimline Housing Style (ISL)** is an excellent choice for most immersion testing applications. This style will accommodate element diameters up to 1/2" and features a stainless steel housing for rugged dependability.

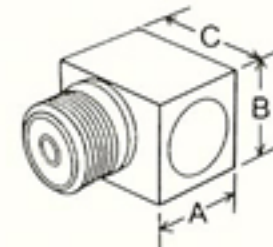
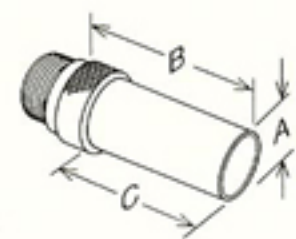
The **Right Angle Housing Style (IRA)** is an excellent choice when the application requires a sound path at a right angle to the connector such as thru-transmission testing or testing inside the diameter of bore holes or limited access areas. This style will accommodate element diameters up to 1/2" and features a stainless steel housing for rugged dependability.

The ISL and IRA Housing Styles both feature waterproof UHF connectors and epoxy lenses to optimize performance and durability. Spherical or cylindrical focusing is available to increase sensitivity to critical flaws or to improve near-surface resolution. Please refer to the chart on page 22 for practical focusing limits.

A **Right Angle Reflector (ISL-RA)** is available for the ISL Transducer to direct the sound beam 90° into hard to reach areas. Other angles are available on request.

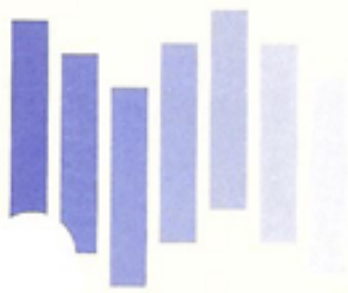


Frequency (MHz)	Element Diameter		
	.250"	.375"	.500"
General Purpose Series (GP)			
1.0	_____	_____	ISL-0104-GP IRA-0104-GP
2.25	ISL-0202-GP IRA-0202-GP	ISL-0203-GP IRA-0203-GP	ISL-0204-GP IRA-0204-GP
3.5	ISL-0302-GP IRA-0302-GP	ISL-0303-GP IRA-0303-GP	ISL-0304-GP IRA-0304-GP
5.0	ISL-0502-GP IRA-0502-GP	ISL-0503-GP IRA-0503-GP	ISL-0504-GP IRA-0504-GP
10.0	ISL-1002-GP IRA-1002-GP	ISL-1003-GP IRA-1003-GP	ISL-1004-GP IRA-1004-GP
Very High Resolution Series (VHR)			
10.0	ISL-1002-VHR IRA-1002-VHR	ISL-1003-VHR IRA-1003-VHR	ISL-1004-VHR IRA-1004-VHR
15.0	ISL-1502-VHR IRA-1502-VHR	ISL-1503-VHR IRA-1503-VHR	_____
20.0	ISL-2002-VHR IRA-2002-VHR	_____	_____
25.0	ISL-2502-VHR IRA-2502-VHR	_____	_____
High Resolution Series (HR)			
2.25	ISL-0202-HR IRA-0202-HR	ISL-0203-HR IRA-0203-HR	ISL-0204-HR IRA-0204-HR
3.5	ISL-0302-HR IRA-0302-HR	ISL-0303-HR IRA-0303-HR	ISL-0304-HR IRA-0304-HR
5.0	ISL-0502-HR IRA-0502-HR	ISL-0503-HR IRA-0503-HR	ISL-0504-HR IRA-0504-HR
10.0	ISL-1002-HR IRA-1002-HR	ISL-1003-HR IRA-1003-HR	ISL-1004-HR IRA-1004-HR
15.0	ISL-1502-HR IRA-1502-HR	ISL-1503-HR IRA-1503-HR	_____
20.0	ISL-2002-HR IRA-2002-HR	_____	_____
25.0	ISL-2502-HR IRA-2502-HR	_____	_____



DIMENSIONS (ISL)		
A	B	C
.625"	1.675"	1.360"

DIMENSIONS (IRA)			
Element	A	B	C
.250"	.75"	.75"	.94"
.375"	.75"	.75"	.94"
.500"	.75"	.75"	.94"



Immersion Transducers

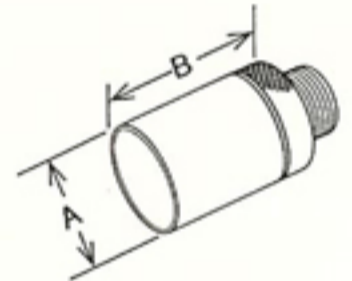
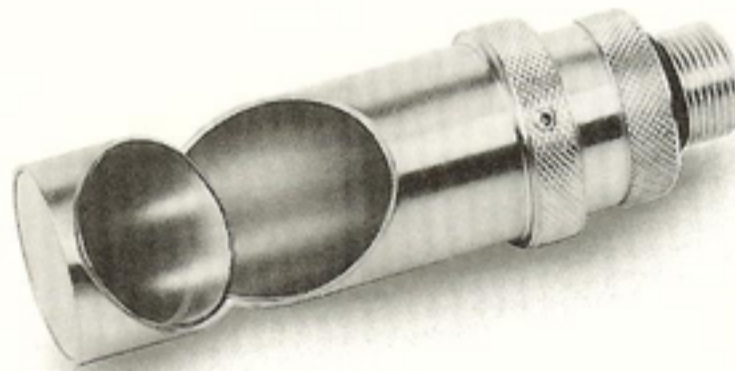
The **Large Diameter Housing Style (ILD)** is the housing of choice for general purpose testing when element diameters greater than 1/2" are desired. This stainless steel housing features a water-proof UHF connector and an acoustically matched epoxy lens to optimize performance and prevent water intrusion.

The **Flange Housing Style (IF)** is designed to fit the 1.375" diameter search tube systems found in many immersion and squirter systems. The stainless steel housing and acoustically matched epoxy lens ensures optimum transducer performance and durability.

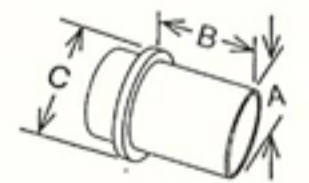
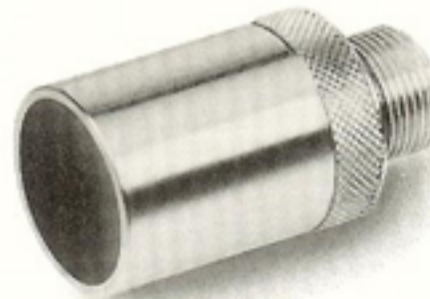
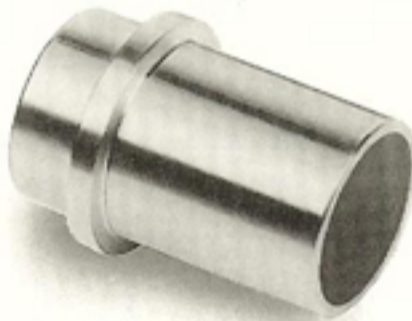
The ILD and IF housing styles are both available with spherical or cylindrical focusing to increase sensitivity to critical flaws or to improve near surface resolution. Please refer to the chart on page 22 for practical focusing limits.

A **Right Angle Reflector (ILD-RA)** is available for the ILD transducer to direct the sound beam 90° into hard to reach areas. Other angles available upon request.

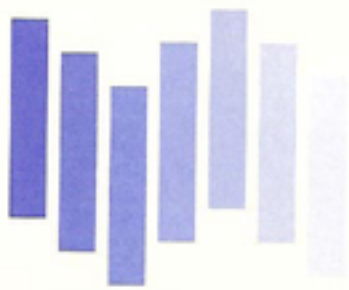
Frequency (MHz)	Large Diameter Style			Flange Style
	.750"	1.00"	1.125"	
General Purpose Series (GP)				
1.0	ILD-0106-GP	ILD-0108-GP	ILD-0109-GP	IF-0106-GP
2.25	ILD-0206-GP	ILD-0208-GP	ILD-0209-GP	IF-0206-GP
3.5	ILD-0306-GP	ILD-0308-GP	ILD-0309-GP	IF-0306-GP
5.0	ILD-0506-GP	ILD-0508-GP	ILD-0509-GP	IF-0506-GP
10.0	ILD-1006-GP	—	—	IF-1006-GP
High Resolution Series (HR)				
2.25	ILD-0206-HR	ILD-0208-HR	—	IF-0206-HR
3.5	ILD-0306-HR	ILD-0308-HR	—	IF-0306-HR
5.0	ILD-0506-HR	ILD-0508-HR	—	IF-0506-HR
10.0	ILD-1006-HR	—	—	IF-1006-HR
Super Punch Series (SP)				
1.0	ILD-0106-SP	ILD-0108-SP	ILD-0109-SP	IF-0106-SP
2.25	ILD-0206-SP	ILD-0208-SP	ILD-0209-SP	IF-0206-SP
3.5	ILD-0306-SP	ILD-0308-SP	ILD-0309-SP	IF-0306-SP
5.0	ILD-0506-SP	ILD-0508-SP	ILD-0509-SP	IF-0506-SP



DIMENSIONS (ILD)		
Element	A	B
.75"	1.00"	1.38"
1.00"	1.25"	1.38"
1.125"	1.37"	1.38"



DIMENSIONS (IF)		
A	B	C
.990"	1.130"	1.20"



Immersion Transducers

Technisonic offers three pencil housing styles accommodating .250" diameter elements. All feature stainless steel housings and acoustically matched epoxy lenses for optimum transducer performance and durability.

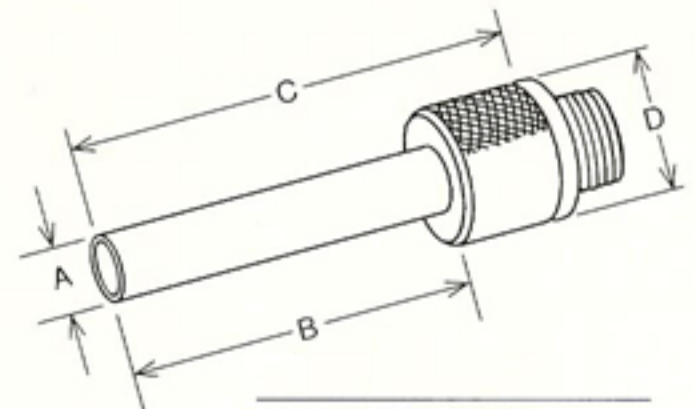
The **IPM Model** is 1" long while the **IPML** is 1.5" long. A microdot connector is standard on both. These are ideal for applications where transducer size constraints are encountered.

The **IPU Style** features a knurled flange and a UHF connector for easy insertion into standard immersion systems. A right angle mounted element is available on special order.

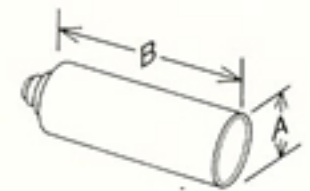
The **IPM, IPML** and **IPU** are all available with spherical or cylindrical focusing to increase sensitivity to critical flaws or to improve near surface resolution. Please refer to the chart on page 22 for practical focusing limits.

A **Right Angle Reflector (IP-RA)** is available to direct the sound beam 90° into hard to reach areas. Other angles are available.

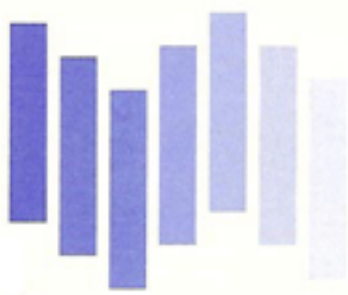
Frequency (MHz)	Style IPM	Style IPML	Style IPU
General Purpose Series (GP)			
2.25	IPM-0202-GP	IPML-0202-GP	IPU-0202-GP
3.5	IPM-0302-GP	IPML-0302-GP	IPU-0302-GP
5.0	IPM-0502-GP	IPML-0502-GP	IPU-0502-GP
10.0	IPM-1002-GP	IPML-1002-GP	IPU-1002-GP
Very High Resolution Series (VHR)			
10.0	IPM-1002-VHR	IPML-1002-VHR	IPU-1002-VHR
15.0	IPM-1502-VHR	IPML-1502-VHR	IPU-1502-VHR
20.0	IPM-2002-VHR	IPML-2002-VHR	IPU-2002-VHR
25.0	IPM-2502-VHR	IPML-2502-VHR	IPU-2502-VHR
High Resolution Series (HR)			
2.25	IPM-0202-HR	IPML-0202-HR	IPU-0202-HR
3.5	IPM-0302-HR	IPML-0302-HR	IPU-0302-HR
5.0	IPM-0502-HR	IPML-0502-HR	IPU-0502-HR
10.0	IPM-1002-HR	IPML-1002-HR	IPU-1002-HR
15.0	IPM-1502-HR	IPML-1502-HR	IPU-1502-HR
20.0	IPM-2002-HR	IPML-2002-HR	IPU-2002-HR
25.0	IPM-2502-HR	IPML-2502-HR	IPU-2502-HR



DIMENSIONS (IPU)			
A	B	C	D
.375"	2.00"	2.55"	.750"



DIMENSIONS		
	A	B
IPM	.375"	1.00"
IPML	.375"	1.50"



Cables, Search Tubes & Adaptors

Cables

Technisonic offers a complete line of transducer cables. These cables are designed for optimum performance and durability.



UHF



Triax



BNC



Lemo



Microdot



UHF - Waterproof

Cables

Description	Length (feet)	Cable Type	Part Number
Microdot/BNC	6	RG 174	MB-6
Microdot/UHF	6	RG 174	MU-6
Microdot/Lemo #00	6	RG 174	ML00-6
Dual Microdot/Lemo #00	6	RG 174	DML00-6
Dual Microdot/BNC	6	RG 174	DMB-6
BNC/BNC	6	RG 58	BB-58-6
BNC/BNC	6	RG 174	BB-174-6
BNC/UHF	6	RG 58	BU-6
BNC/Lemo #1	6	RG 58	BL1-6
BNC/Lemo #00	6	RG 174	BL00-6
BNC/UHF Waterproof	6	RG 58	BUW-6
Triax/UHF Waterproof	6	Belden 9222	TUW-6
Bell Housing Microdot/BNC	6	RG 174	BHMB-6
Bell Housing Microdot/Lemo #00	6	RG 174	BHML00-6
Bell Housing Microdot/Lemo #1	6	RG 174	BHML1-6

• Special cable configurations and lengths are available.

Search Tubes

Technisonic's Search Tubes are made of 304 Stainless Steel and are centerless ground to .737" diameter. Search tubes in .748" diameter are also available, upon request, at no additional cost. All search tubes 4" long or longer are manufactured with an integral UHF connector for unparalleled strength.



Search Tubes

Length (in.)	Part No.	Length (in.)	Part No.
2.0	ST-2	18.0	ST-18
4.0	ST-4	24.0	ST-24
6.0	ST-6	36.0	ST-36
12.0	ST-12		

• Special Search Tube lengths and diameters are available.

Adaptors



UHF/STIF



Lemo/BNC



BNC/Lemo



UHF/BNC

Adaptors

Type	Description	Part No.
BNC/UHF	Adapts transducer with BNC connector to cable with UHF	B-U
UHF/BNC	Adapts transducer with UHF connector to cable with BNC	U-B
Lemo/BNC	Adapts instrument with Lemo #1 connector to BNC cable	L1-B
STUHF/RA	Right Angle adaptor for 3/4" Search Tube	ST-RA
UHF/STIF	Adapts transducer with UHF connector to 1 3/8" Search Tube	U-IF
BNC/MD	Adapts instrument with BNC to microdot cable	B-M
BNC/Lemo	Adapts instrument with BNC to Lemo #1 cable	B-L1
BNC/BNC	Couples BNC cable to another BNC cable.	B-B



STUHF/RA



BNC/UHF



BNC/BNC



BNC/MD



Test Blocks

Technisonic offers a complete line of ultrasonic test blocks. These blocks are ultrasonically inspected and machined to precise engineering specifications.

Steel blocks are nickel plated and aluminum blocks are anodized for long, dependable service. Wooden cases optional.

IW Type 1: Calibration of shear and longitudinal transducers; and for determining shear wedge exit point and refracted angle.

IW Type 2: Modified version of IW Type 1 with 2.0" radius and additional holes for resolution comparison.

Type DC: Shear wave distance calibration. Contains 1.0" and 2.0" radius.

Type SC: Shear wave sensitivity calibration. Contains two .062" side drilled holes.

AWS Resolution Block: Used for determining resolution capabilities of angle beam (shear wave) transducers.

Type DSC: Shear wave distance and sensitivity calibration. Also used for verification of sound exit point on wedge and refracted angles.

IOW Beam Profile Block: Beam profile measurement of angle beam (shear wave) transducers.

Step Blocks: Thickness and linearity calibration for longitudinal transducers.

NAVSHIPS Test Block: Used for sensitivity, distance amplitude, and flaw depth information. Conforms to NAVSHIPS Specification 0900-006-3010.

30 FBH Resolution Block: Used for determining resolution and sensitivity characteristics for normal beam transducers. Also useful for area/amplitude plots.

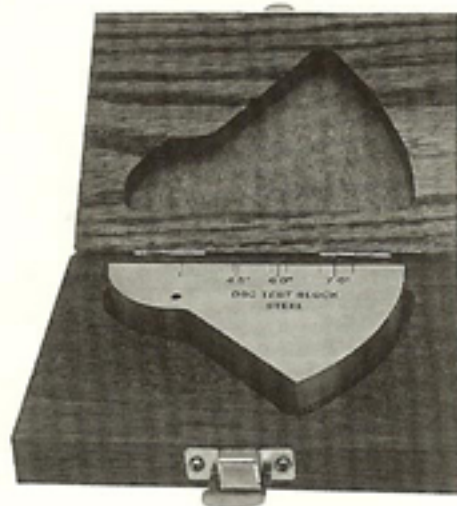
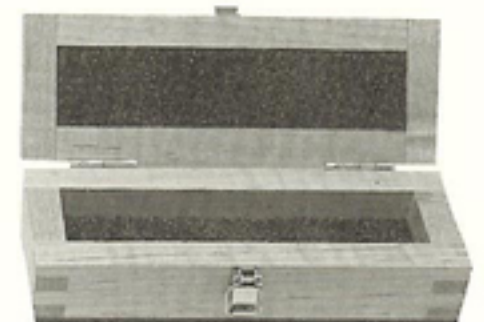
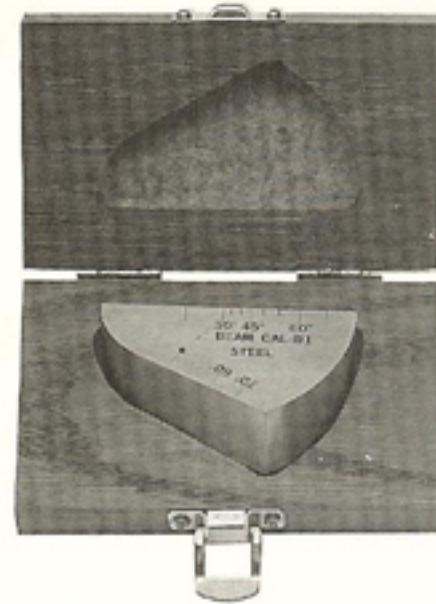
ASME Calibrating Blocks: One flat bottom hole (FBH) with diameter and depth per requirement.

ASTM Area/Amplitude Set: Consists of eight blocks for area/amplitude determination. Hole size is #1 FBH (1/64") to #8 FBH (8/64") at .300" depth.

ASTM Distance/Amplitude Set: Nineteen blocks with the same specified flat bottom hole size. Metal travel distances are as follows: .060", .120", .250", .370", .500", .620", .750", .870", 1.00", 1.25", 1.75", 2.25", 2.75", 3.25", 3.75", 4.25", 4.75", 5.25", 5.75".

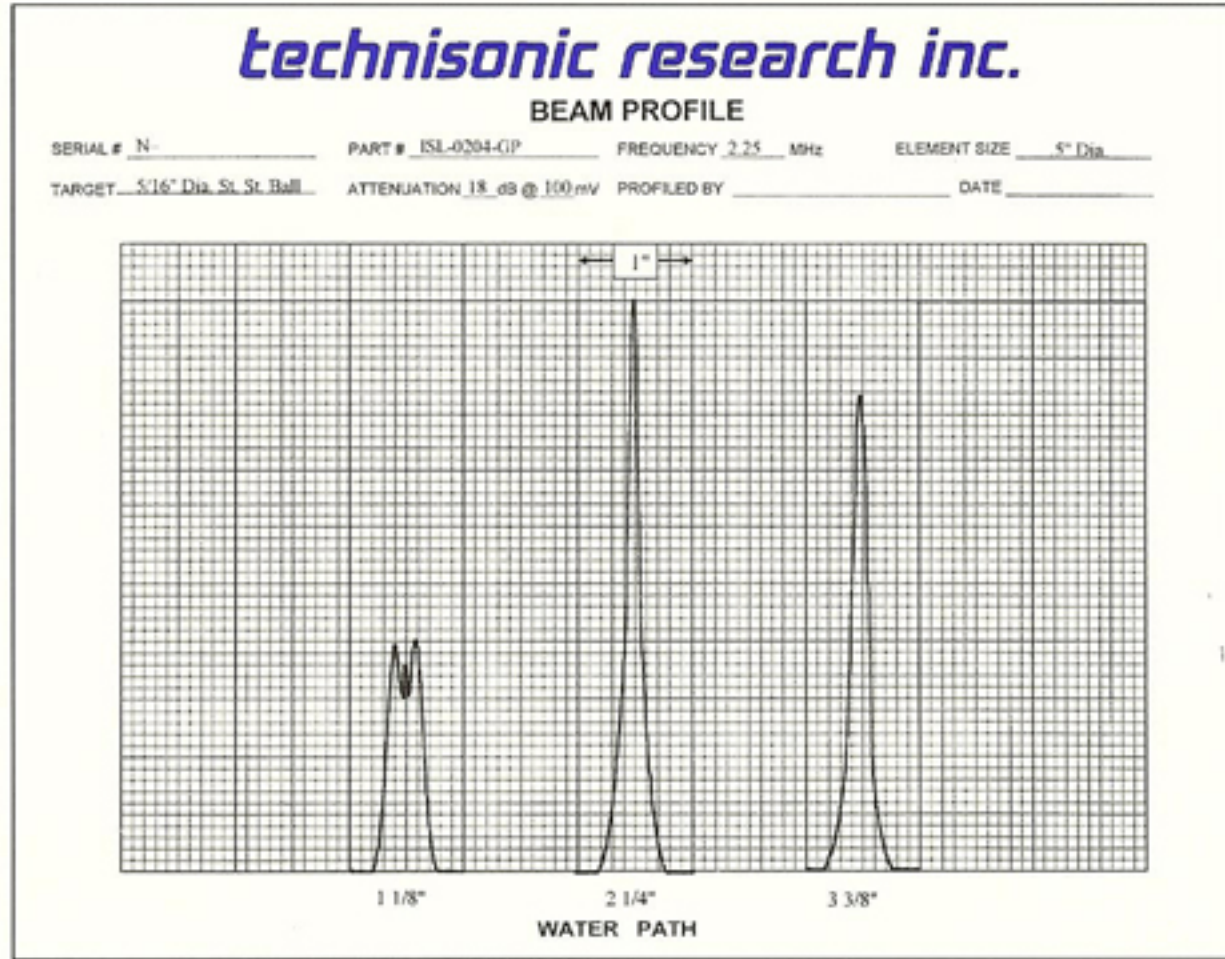
ASTM Distance/Area - Amplitude Set: Ten blocks with flat bottom holes as follows: #3 @ 3.00", #5 @ .120", #5 @ .250", #5 @ .500", #5 @ .750", #5 @ 1.50", #5 @ 3.00", #5 @ 6.00", #8 @ 3.00", #8 @ 6.00".

Single ASTM Blocks: Sensitivity or resolution measurement of normal beam transducers. Any block from the above ASTM set is available.





Transducer Certification



Transducer Certification

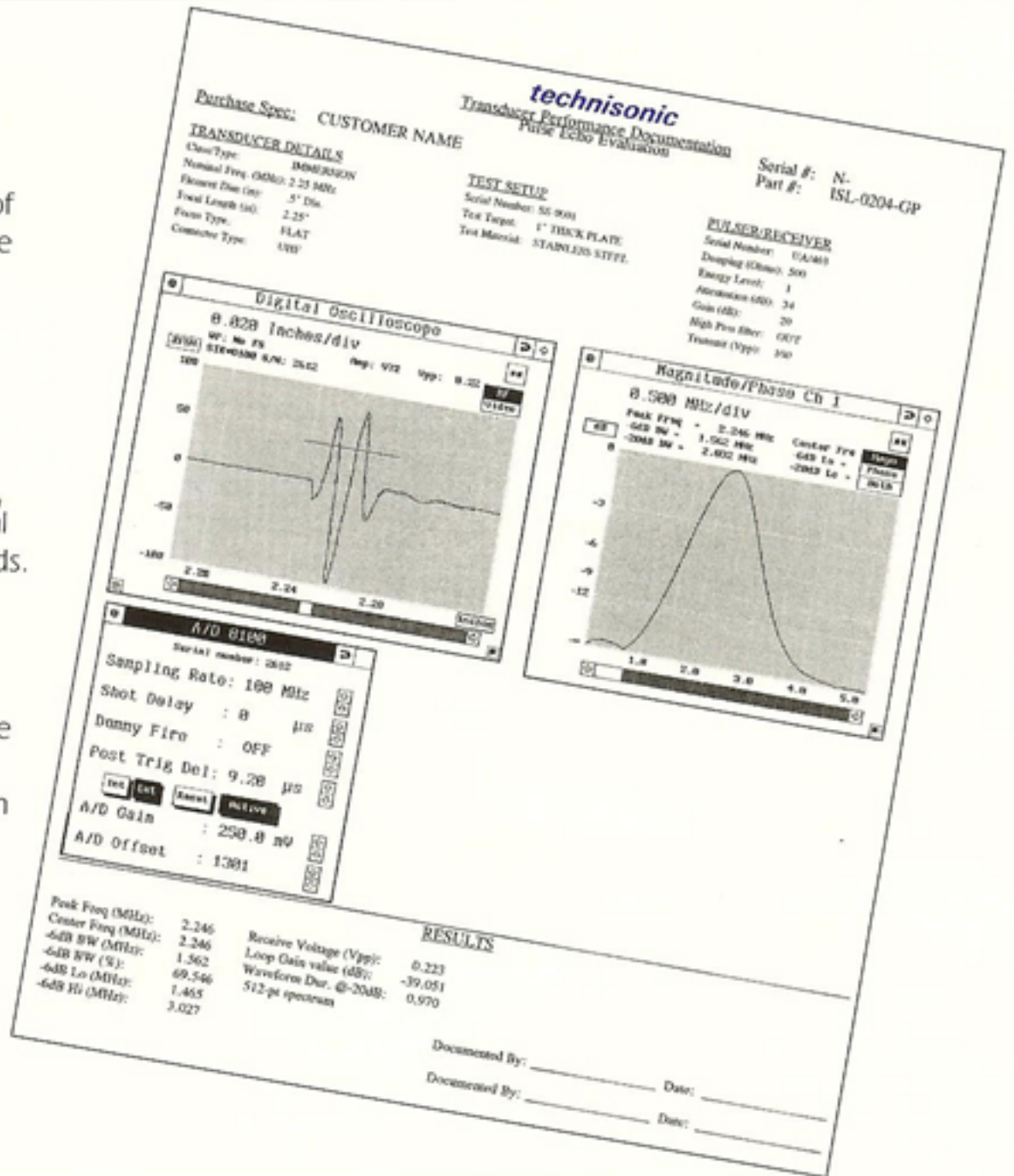
Technisonic provides certification on all standard transducers at no charge. This certification consists of a real-time waveform and a frequency spectrum. The real-time waveform displays the natural unbiased waveform and ringdown characteristics of the transducer. The frequency spectrum displays characteristics such as peak frequency, center frequency and bandwidth.

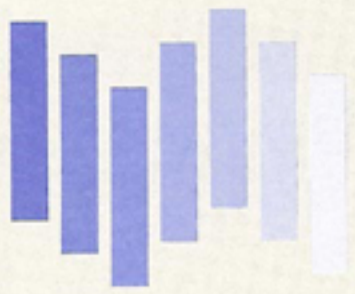
Distance Amplitude Curve

The distance amplitude curve shows the exponential decay of the far field and the effects of the near fields.

Beam Profile

The beam profile plot provides vital sound beam information such as beam dimensions and relative intensity at various water distances. The beam profile is made by moving the transducer across a target (steel ball, rod or wire) and plotting the sound beam intensity across the face of the transducer.

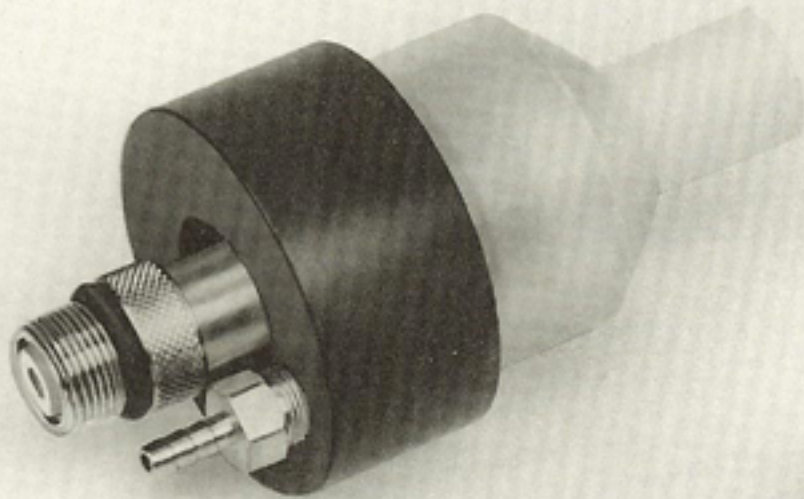




Specials



Curved Element Bore Probe



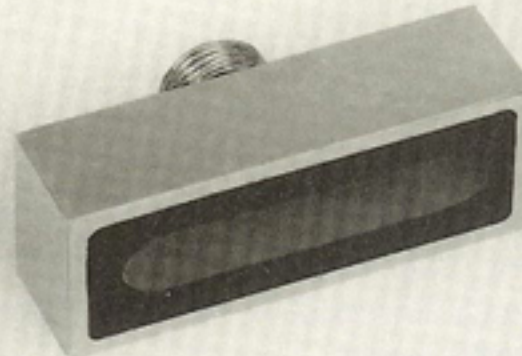
Custom Water Squirter



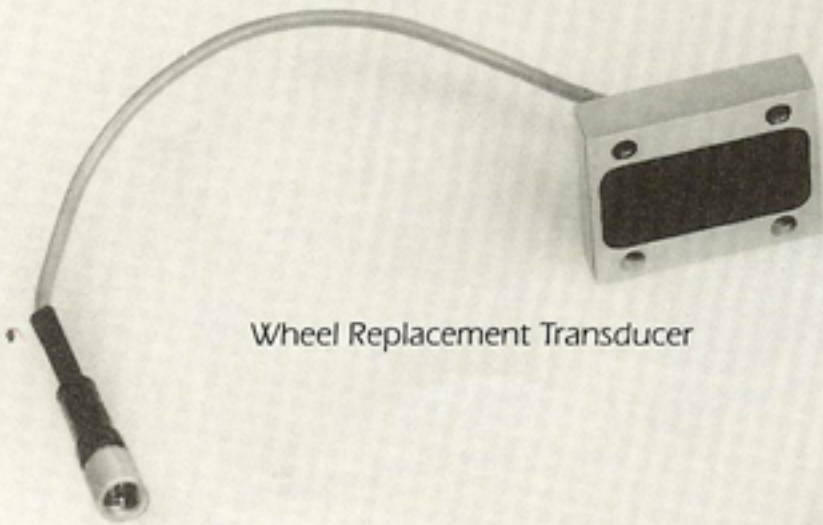
Dual Longitudinal & Dual Shear Wave Transducer



Transducer & Bubbler System



Immersion Paintbrush Transducer



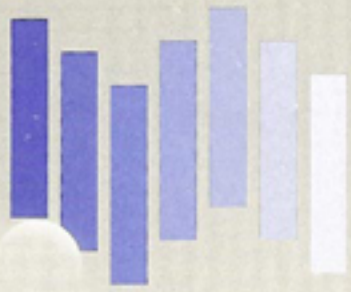
Wheel Replacement Transducer



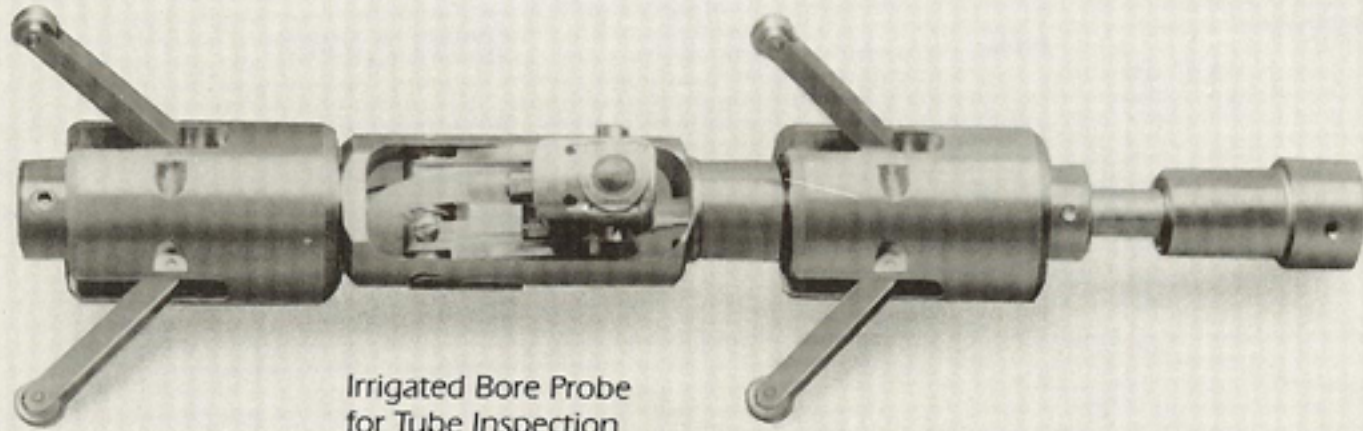
Custom, Restricted Access Transducer for Jet Engine Inspection



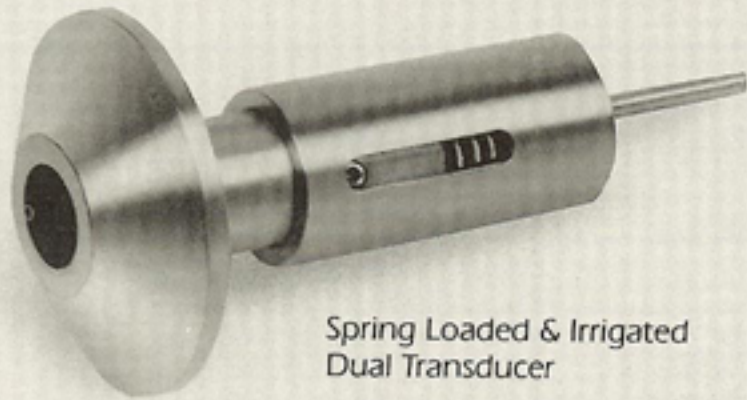
"Creeping Wave 30•70•70" Flaw Sizing Transducer



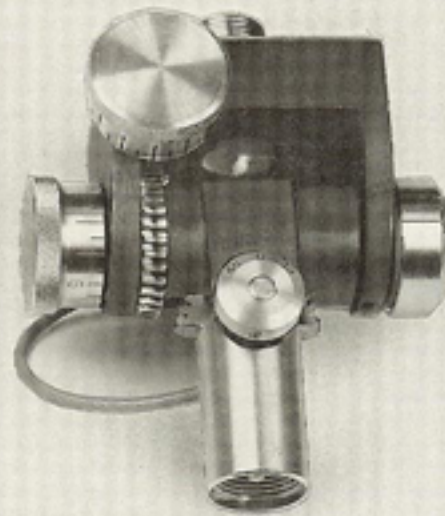
Specials



Irrigated Bore Probe
for Tube Inspection
1.5" - 3.0" I.D.



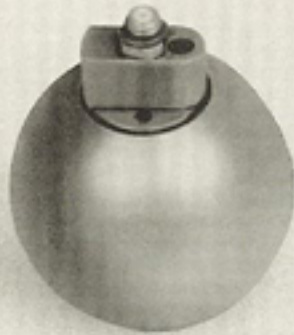
Spring Loaded & Irrigated
Dual Transducer



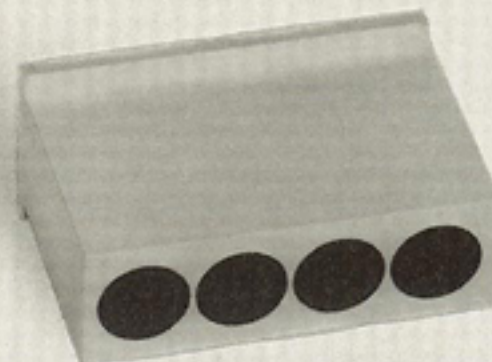
X-Y Manipulator



Custom Dual for
Pipe Inspection



Ball Transducers for
Rotary Inspection System



4 Element Array
for Plate Inspection System



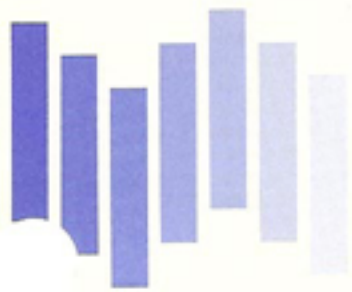
Fixed Angle Transducer
for Rotary Inspection System



Spot Weld Transducer



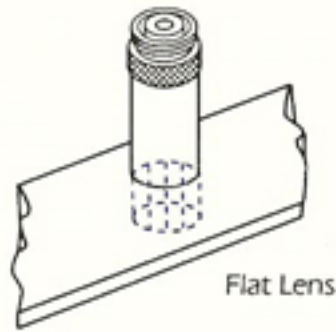
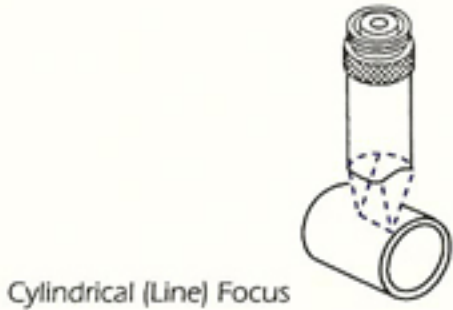
Spot Weld Transducers



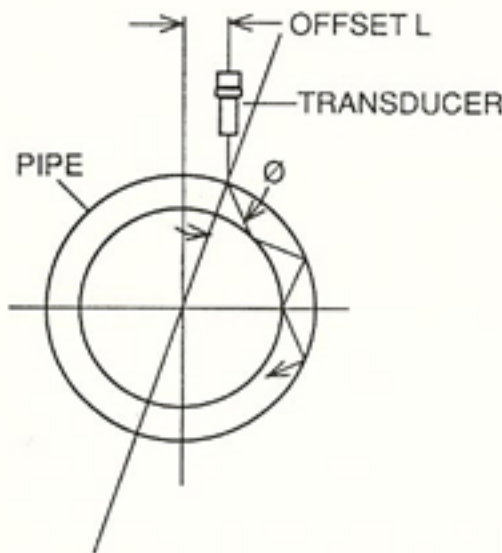
Useful Information

Immersion Testing

Focusing Options



Tube Testing



Where: L = Transducer offset from tube center line
 D = Diameter of tube
 ϕ = Desired refracted angle of sound beam (usually shear wave)
 V_w = Velocity of coupling medium (usually water)
 V_M = Velocity of tube (shear or longitudinal)

$$\text{Offset } L = \left(\frac{D}{2}\right) \left(\frac{V_w}{V_M}\right) \sin \phi$$

Beam Spread

$$\phi = 2 \sin^{-1} \left(\frac{.5\lambda}{D} \right)$$

Where: λ = Velocity (in. / μ s) \div Frequency (MHz)
 D = Element diameter (in.)



Immersion Nearfield & Practical Focus

Freq. (MHz)	Element Dia. in.	N	Min. Focus	Max Focus
0.5	0.75	1.20	—	1.00
	1.00	2.14	1.50	—
	1.125	2.74	1.50	2.00
1.0	.50	1.07	—	0.75
	0.75	2.41	1.00	1.75
	1.00	4.28	1.50	3.00
	1.125	5.41	1.50	4.00
2.25	0.25	0.60	—	0.50
	0.375	1.35	—	1.00
	0.50	2.40	1.00	1.75
	0.75	5.41	1.50	4.00
	1.00	9.63	2.00	7.00
3.5	0.25	0.94	—	0.75
	0.375	2.11	0.75	1.50
	0.50	3.75	1.00	3.00
	0.75	8.43	1.50	6.00
	1.00	14.98	2.00	11.00
5.0	0.25	1.34	0.50	1.00
	0.375	3.01	0.75	2.00
	0.50	5.35	1.00	4.00
	0.75	12.04	1.50	9.00
	1.00	21.40	2.00	15.00
10.0	0.125	0.67	—	0.50
	0.25	2.68	0.50	2.00
	0.375	6.02	0.75	4.50
	0.50	10.70	1.00	8.00
	0.75	24.08	1.50	10.00
15.0	0.125	1.00	0.50	0.75
	0.25	4.01	0.50	3.00
	0.375	9.02	0.75	5.00
20.0	0.125	1.34	0.50	1.00
	0.25	5.35	0.50	3.00
25.0	0.125	1.67	0.50	1.25
	0.25	6.99	0.50	3.00

$$N = \frac{D^2 F}{4V}$$

Where: N = Nearfield Distance
 D = Element Diameter
 F = Frequency
 V = Material Velocity

dB vs. Amplitude Ratios

dB	Ratio
0	1.00:1
.5	1.06:1
1	1.12:1
2	1.26:1
3	1.41:1
4	1.58:1
5	1.78:1
6	2.00:1
7	2.24:1
8	2.51:1
9	2.82:1
10	3.16:1
11	3.55:1
12	3.98:1
13	4.47:1
14	5.01:1
15	5.62:1
16	6.31:1
17	7.08:1
18	7.94:1
19	8.91:1
20	10.00:1
40	100.00:1
60	1000.00:1