



Transducer Catalogue

Sonatest has one over-riding and driving motivation – to design, manufacture and market the world's best NDT products. The pace of our own R&D investment has increased and we have formed strategic partnerships to provide our customers with an unmatched range of leading NDT instruments, transducers and systems. We are delighted to present our growing range of transducers within this catalogue.

Our global network of distributors should ensure that excellence technical and after-sales support is always available locally to you.

Sonatest manufacture a complete range of high performance, high technology ultrasonic transducers for general flaw detection and thickness measurement applications. Each transducer is made to exacting standards regarding acoustical, electronic and mechanical properties. Our transducers are tested thoroughly, typically at three stages of manufacture. The complete range of transducer types are available with a variety of connector styles, case configurations, frequencies and element sizes. This catalogue presents our standard-build angle, frequency and elements sizes; other combinations are available on request.

Our transducers are used across a wide range of industries including aerospace, automotive, marine, petrochemical, nuclear, power generation, metal and composite fabrication. Applications include a spectrum of inspection and evaluation testing procedures, i.e. aircraft engine components, nuclear components such as fuel containers, automotive components, petrochemical processing equipment and general high performance critical materials.

We are sure that you will find the correct product to provide the results that you require. However, if you find you require further advice or consultation on specific applications, do not hesitate to contact us. With our expertise and knowledge we can guarantee to provide the NDT solutions for the most challenging of applications. Should you require more detailed information, technical assistance, on-site demonstration, training or

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Contents

Applications Matrix.....	4
Sonatest Ltd (Metric)	
Single Compression Transducers	6
Twin Compression Transducers	13
Single Angle Shearwave Transducers	17
Twin Angle Shearwave Transducers	22
Sirius Transducer Range.....	23
Immersion Transducers.....	29
Sonatest Inc (Imperial)	
Single Compression Transducers	31
Fingertip Contact Transducers	33
Shearwave Transducers	34
Standard & Snail Wedges	37
Miniature Angle Beam Transducers	38
Dual Element Transducers	40
Delay Line Transducers	42
Immersion Transducers	44
Application Specific Transducers.....	45
WheelProbes	48
Phased Array Transducers	52
Cables & Adapters	56
Couplant	57
Calibration Blocks	58
Fundamentals of Ultrasonic NDT	60
Transducer Types	64
Material Acoustic Properties Table	66

Due to a policy of continual development and process improvement, the data presented within this catalogue is subject to change without notice.

Applications Matrix

The Applications Matrix below is a quick reference guide to selecting the transducer model that may be suitable for your specific application or the material that requires testing.

Model	Aerospace	Bars	Billets	Bond Testing	Castings	Ceramics	Composites	Lamination	Forgings	Glass	Brazed Joints	Machined Parts	Thickness	Tube & Pipe	Critical Welds	General Welds	White Metal	Boiler Tubes
SLH						•	•					•	•					
SLM						•	•					•						
SLF		•	•	•	•			•	•									
LLF	•		•		•				•									
SLP	•					•	•					•						
SLC		•	•		•			•	•			•						
SLG		•	•		•	•	•	•	•			•						
D	•			•							•	•	•	•			•	
CD	•	•	•	•	•	•	•	•	•		•	•	•				•	
CDF		•	•	•	•			•	•		•	•			•	•	•	
GEM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
TCD	•	•	•	•	•	•	•	•	•			•	•	•			•	
ORION					•	•			•			•		•	•			
SAO					•				•			•		•		•		
SA					•	•			•			•		•		•		
HSA					•				•						•	•		
LSA														•	•	•		
CDA					•				•					•	•	•		
SLIH	•								•			•		•				
SLIM	•								•			•		•				
BTP													•	•	•			•
TMP	•			•			•			•	•	•	•	•				
STP	•			•			•											
RP	•			•			•											
SLM Inc						•	•					•						
PSLM						•	•					•						
SLF Inc		•	•	•	•			•	•									
PSLF		•	•	•	•			•	•									
FCG		•	•		•			•	•			•						
FCR		•	•		•			•	•			•						
PFC		•	•		•			•	•			•						
QCR	•				•				•			•			•		•	
QCG	•				•				•			•			•		•	
PQC	•				•				•			•			•		•	
QW	•				•				•			•			•		•	
MSR						•			•					•	•	•		
MSG						•			•					•	•	•		
PMS						•			•					•	•	•		

This guide can not be absolute or all-inclusive.

If your requirements are not listed below please call Sonatest Ltd on +44 (0)1908 316345 or email sales@sonatest.com; or Sonatest Inc on +1(210) 697-0335 or email sales@sonatestinc.com.

Model	Aerospace	Bars	Billets	Bond Testing	Castings	Ceramics	Composites	Lamination	Forgings	Glass	Brazed Joints	Machined Parts	Thickness	Tube & Pipe	Critical Welds	General Welds	White Metal	Boiler Tubes
MW						•			•					•	•	•		
SSR															•	•		
SSG															•	•		
PSS															•	•		
SW															•	•		
SNW															•	•		
MAP					•									•	•	•		
PMAP					•									•	•	•		
LAP														•	•	•		
MMAP	•						•								•			
PMMAP	•						•								•			
DEM	•	•	•	•	•	•	•	•	•			•	•	•			•	
PDEM	•	•	•	•	•	•	•	•	•			•	•	•			•	
DEI	•			•							•	•	•	•			•	
PDEI	•			•							•	•	•	•			•	
RDT	•			•			•			•	•	•	•	•				
PD	•			•							•	•	•	•			•	
IMR						•	•					•	•					
IMG						•	•					•	•					
PIM						•	•					•	•					
CDA Inc					•				•					•	•	•		
SMA					•	•			•			•		•		•		
MMA					•	•			•			•		•	•	•		
LMA														•	•	•		
T SMA					•				•					•	•	•		
SHM						•	•					•	•					
LHM						•	•					•	•					
SMM		•	•	•	•			•	•									
LMM		•	•	•	•			•	•									
THM	•	•	•	•	•	•	•	•	•			•	•	•			•	
DAAH	•						•					•			•			
X-Series	•						•					•			•			
WHP	•						•	•						•				
BR																		•
DL													•	•				
MAG																		•
EMAT														•				•

Single Compression High Damped SLH



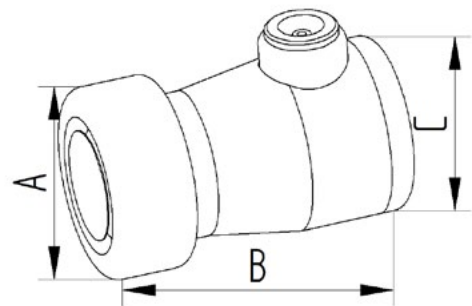
Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- High damped for best resolution.
- Ceramic wear face and steel wear ring to prolong service life.
- Stainless steel ergonomic case for good grip and ease of use.

Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
SLH1-25	1.25	25	33
SLH2-10	2.25	10	9
SLH2-15	2.25	15	21
SLH2-20	2.25	20	38
SLH2-25	2.25	25	59
SLH4-10	4	10	17
SLH4-25	4	25	105
SLH5-10	5	10	21
SLH5-15	5	15	47
SLH5-20	5	20	84
SLH5-25	5	25	132
SLH10-5	10	5	11
SLH10-10	10	10	42

Frequent Applications

- Ceramics, Porcelain
- Composites
- Machined Parts
- Thickness Measurement



Size Options		Connector Options												
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
5	21.0	32.0	19.0	-	-	•	•	•	-	-	-	-	•	-
10	21.0	32.0	19.0	-	-	•	•	•	-	-	-	-	•	-
15	26.0	32.0	24.0	-	-	•	•	•	-	-	-	-	•	-
20	36.0	38.0	34.0	•	•	-	-	-	-	-	-	-	•	-
25	36.0	38.0	34.0	•	•	-	-	-	-	-	-	-	•	-

Single Compression Medium Damped SLM



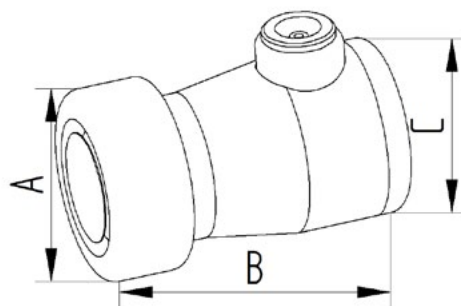
Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- Medium damped for general use.
- Ceramic wear face and steel wear ring to prolong service life.
- Stainless steel ergonomic case for good grip and ease of use.
- Composite version available see PSLM.

Transducer Models			
type	f	Ø	N
p/n	(MHz)	(mm)	(mm)
SLM1-25	1.25	25	33
SLM2-10	2.25	10	9
SLM2-15	2.25	15	21
SLM2-20	2.25	20	38
SLM2-25	2.25	25	59
SLM4-10	4	10	17
SLM4-25	4	25	105
SLM5-10	5	10	21
SLM5-15	5	15	47
SLM5-20	5	20	84
SLM5-25	5	25	132
SLM10-10	10	10	11

Frequent Applications

- Ceramics
- Composites



Size Options				Connector Options										
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	Ø	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
5	21.0	32.0	19.0	-	-	•	•	•	-	-	-	-	•	-
10	21.0	32.0	19.0	-	-	•	•	•	-	-	-	-	•	-
15	26.0	32.0	24.0	-	-	•	•	•	-	-	-	-	•	-
20	36.0	38.0	34.0	•	•	-	-	-	-	-	-	-	•	-
25	36.0	38.0	34.0	•	•	-	-	-	-	-	-	-	•	-

Single Compression Replaceable Membrane

SLF



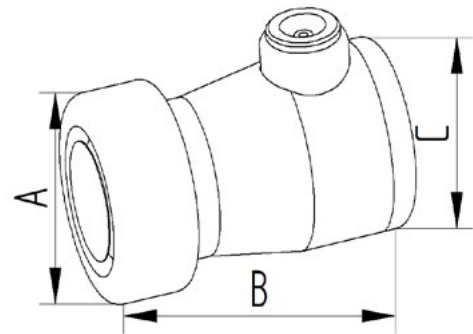
Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- Medium damped for general use.
- Polymer membrane protected face facilitates coupling with minimum couplant.
- Delay Lines available.
- Stainless steel ergonomic case for good grip and ease of use.
- Composite version available, see PSLF.

Frequent Applications

- Casting & Forgings
- Bars & Billets
- Bond Testing
- Laminations

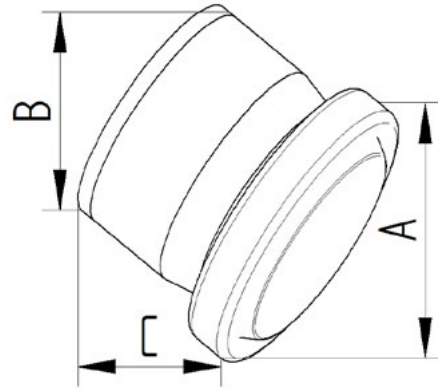
Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
SLF1-25	1.25	25	33
SLF2-10	2.25	10	9
SLF2-15	2.25	15	21
SLF2-20	2.25	20	38
SLF2-25	2.25	25	59
SLF4-10	4	10	17
SLF4-25	4	25	105
SLF5-10	5	10	21
SLF5-15	5	15	47
SLF5-20	5	20	84
SLF5-25	5	25	132



Size Options		Connector Options												
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10	21.0	32.0	19.0	-	-	•	•	•	-	-	-	-	•	-
15	26.0	32.0	24.0	-	-	•	•	•	-	-	-	-	•	-
20	36.0	38.0	34.0	•	•	-	-	-	-	-	-	-	•	-
25	36.0	38.0	34.0	•	•	-	-	-	-	-	-	-	•	-

Single Compression Large Low Frequency

LLF



Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- Medium damped for medium bandwidth.
- Polymer membrane protected face facilitates coupling with minimum couplant.
- Can be used with delay-lines for high temperature inspection.
- Stainless steel ergonomic case for good grip and ease of use.

Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
LLF0.5-34	0.5	34	24
LLF1-34	1.25	34	61
LLF2-30	2.25	30	85

Frequent Applications

- Aerospace
- Billets
- Castings
- Forgings

Size Options				Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
30	53.5	39.0	44.0	•	•	-	-	-	-	•	-	-	-
34	53.5	39.0	44.0	•	•	-	-	-	-	•	-	-	-

Single Compression High Damped Low Profile SLP



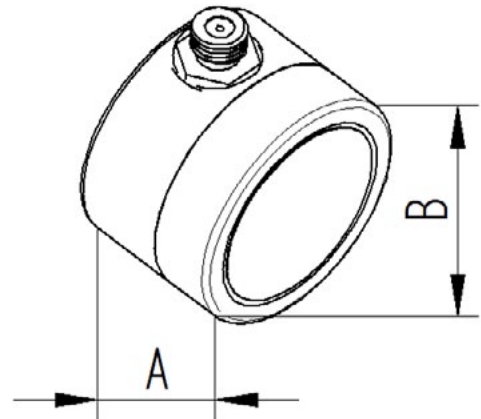
Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- High damped for best resolution.
- Ceramic wear face and steel wear ring to prolong service life.
- Low-profile stainless steel ergonomic case to facilitate inspection access.

Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
SLP1-20	1.25	20	21
SLP1-25	1.25	25	33
SLP2-10	2.25	10	9
SLP2-15	2.25	15	21
SLP2-20	2.25	20	38
SLP2-25	2.25	25	59
SLP4-10	4	10	17
SLP4-25	4	25	105
SLP5-5	5	5	5
SLP5-10	5	10	21
SLP5-15	5	15	47
SLP5-20	5	20	84
SLP5-25	5	25	132
SLP10-5	10	5	11
SLP10-10	10	10	42

Frequent Applications

- Aerospace
- Ceramics
- Composites
- Machined Parts



Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)		Connector Type							Connector Position			
	∅	A	B	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
5	12.0	12.0	-	-	-	•	•	-	-	-	•	-	
10	15.0	17.0	-	-	-	•	•	-	-	-	•	-	
15	15.0	22.0	-	-	-	•	•	-	-	-	•	-	
20	15.0	27.0	-	-	-	•	•	-	-	-	•	-	
25	15.0	32.0	-	-	-	•	•	-	-	-	•	-	

Single Compression Low Damped



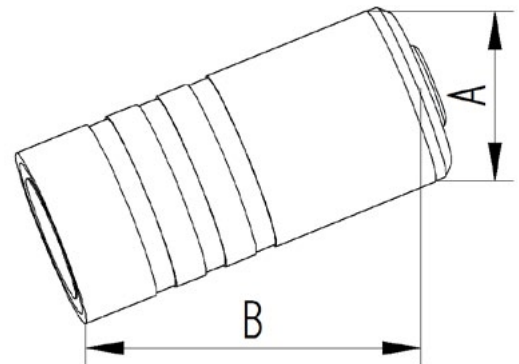
Features

- Single normal beam compression wave contact probe.
- Circular, lead zirconate crystal.
- Low damped for high sensitivity.
- Ceramic wear face and steel wear ring to prolong service life.
- Tubular, knurled stainless steel case for easier mechanical integration.

Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
SLC1-20	1.25	20	21
SLC2-10	2.25	10	9
SLC2-15	2.25	15	21
SLC2-20	2.25	20	38
SLC2-25	2.25	25	59
SLC4-10	4	10	17
SLC4-15	4	15	38
SLC4-20	4	20	67
SLC5-10	5	10	21

Frequent Applications

- Bars
- Billets
- Castings & Forgings
- Lamination
- Machined Parts



Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)		Connector Type							Connector Position			
	∅	A	B	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10	17.0	37.0	-	-	•	•	•	-	•	-	-	-	
15	22.0	44.0	-	-	•	•	•	-	•	-	-	-	
20	27.0	52.0	-	-	•	•	•	-	•	-	-	-	
25	35.0	56.0	-	-	•	•	•	-	•	-	-	-	

Single Compression High Damped SLG



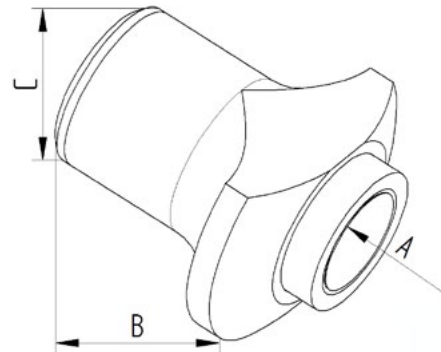
Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- High damped for wide bandwidth.
- Ceramic wear face and steel wear ring to prolong service life.
- Ergonomic plastic finger-grip case for ease of use.

Frequent Applications

- Bars
- Billets
- Castings
- Ceramics
- Composites
- Lamination
- Forgings
- Machined parts

Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
SLG2-10	2.25	10	9
SLG4-10	4	10	17
SLG5-10	5	10	21
SLG10-10	10	10	42



Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
∅ 10	17	32	19	-	-	•	•	•	-	•	-	-	-

Twin Compression

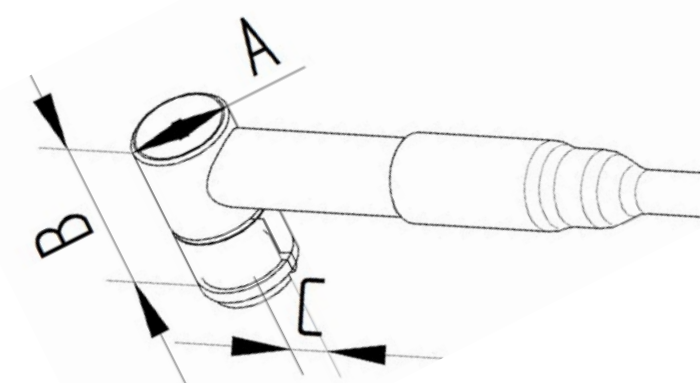
Features

- Dual normal beam compression wave contact probe.
- Semi-circular lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Acrylic shoe facilitates profiling to curves parts.
- Button probe case with side-entry cable to facilitate inspection access.
- Integral 2m cable.



Frequent Applications

- Aerospace
- Bond Testing
- Solder Joints
- Machined Parts
- Thickness
- Tube & Pipe
- White Metal



Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
D2-10	2.25	10	7
D5-5	5	5	6
D5-10	5	10	7

Size Options				Connector Options										
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
5	17.0	10.0	7.0		•	•	•	-	-	-	-	-	-	•
10	17.0	16.0	12.5		•	•	•	-	-	-	-	-	-	•

Twin Compression Combined Double

CD



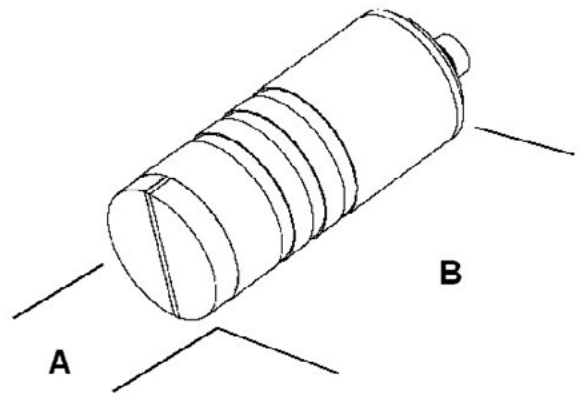
Frequent Applications

- Aerospace
- Bars & Billets
- Bond Testing
- Castings & Forgings
- Ceramics

Features

- Dual normal beam compression wave contact probe.
- Semi-circular/rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Available with high temperature (HT) and short focus (F) shoes.
- Tubular, knurled stainless steel case for easier mechanical integration.
- Lamination
- Machined parts
- Thickness
- Tube & Pipe
- Composites

Transducer Models			
type	f	∅/ a × b	N
p/n	(MHz)	(mm)	(mm)
CD1-15 / 1-15HT	1.25	15	20
CD1-20 / 1-20HT	1.25	20	25
CD2-10 / 2-10HT	2.25	4 × 8	7
CD2-15 / 2-15HT	2.25	5 × 13	16
CD2-20 / 2-20HT	2.25	6 × 17	19
CD2-25 / 2-25HT	2.25	25	38
CD5-10 / 5-10HT	5	4 × 8	15
CD5-15 / 5-15HT	5	5 × 13	16
CD5-20 / 5-20HT	5	20	25
CD5-25	5	25	38
CD5-10F	5	4 × 8	9



Size Options			Connector Options										
Probe Size (mm)	Case Dimensions (mm)		Connector Type							Connector Position			
	∅	A	B	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10	17.0	41.0	-	-	•	•	•	-	•	-	-	-	
15	22.0	48.0	-	-	•	•	•	-	•	-	-	-	
20	27.0	56.0	-	-	•	•	•	-	•	-	-	-	
25	35.0	66.0	-	-	•	•	•	-	•	-	-	-	

Twin Compression Membrane

Features

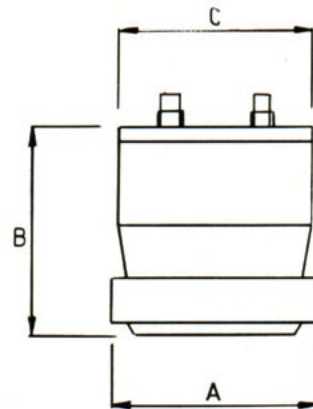
- Dual normal beam compression wave contact probe.
- Semi-circular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.

Frequent Applications

- Bars
- Billets
- Bond testing
- Castings
- Lamination
- Forgings
- Brazed Joints
- Machined Parts
- Critical Welds
- General Welds
- White Metal



Transducer Models			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
CDF1-25	1.25	25	31
CDF2-10	2.25	10	15
CDF2-15	2.25	15	20
CDF2-20	2.25	20	25
CDF2-25	2.25	25	31
CDF5-10	5	10	15
CDF5-15	5	15	20
CDF5-20	5	20	25
CDF5-25	5	25	31



Size Options				Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side
10	21	34	19	-	-	•	•	•	-	•	-	-	-
15	26	34	24	-	-	•	•	•	-	•	-	-	-
20	36	40	34	-	-	•	•	•	-	•	-	-	-
25	36	40	34	-	-	•	•	•	-	•	-	-	-

Twin Compression Gemini

GEM



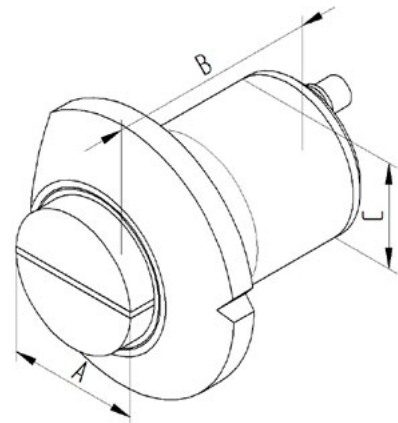
Frequent Applications

- Aerospace
- Bars
- Billets
- Bond testing
- Castings
- Ceramics
- Composites
- Lamination
- Forgings
- Glass
- Solder joints
- Machined parts
- Thickness
- Tube & pipe
- General welds

Features

- Dual normal beam compression wave contact probe.
- Semi-circular/rectangular lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Available with high temperature (HT) and

Transducer Models			
type	f	∅/ a × b	N
p/n	(MHz)	(mm)	(mm)
GEM2-10	2.25	4 × 8	15
GEM4-10	4	10	15
GEM5-10	5	4 × 8	15
GEM5-10F	5	4 × 8	9
GEM2-10HT	2.25	4 × 8	15
GEM4-10HT	4	10	15
GEM5-10HT	5	4 × 8	15



Size Options				Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10	17	32	19	-	-	•	•	•	-	•	-	-	-

Single Angle Shear Wave Circular Crystal

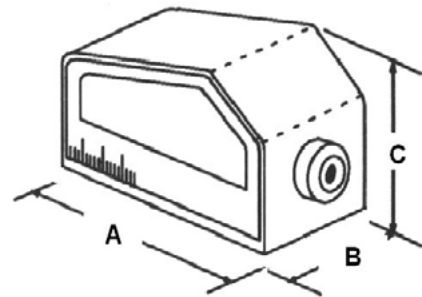


Frequent Applications

- Castings
- Ceramics
- Forgings
- Machined parts
- Tube & Pipe
- Critical Welds

Features

- Single angle shear wave contact probe.
- Circular lead zirconate titanate crystal.
- High damped for wide bandwidth.
- Acrylic face.



Transducer Models				
type	f	Θ	\varnothing	N
p/n	(MHz)	(°)	(mm)	(mm)
ORION2-38	2	38	10	15
ORION2-45	2	45	10	15
ORION2-60	2	60	10	17
ORION2-70	2	70	10	16
ORION4-38	4	38	10	31
ORION4-45	4	45	10	34
ORION4-60	4	60	10	33
ORION4-70	4	70	10	31

Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
\varnothing 10	34	17	26	-	-	•	•	•	-	•	-	-	-

Single Angle Shear Wave SAO



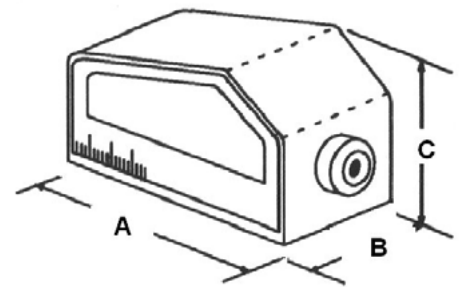
Features

- Single angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Acrylic face.

Frequent Applications

- Castings
- Forgings
- Machined parts
- Tube & Pipe
- General Welds

Transducer Models				
type	f	Θ	a x b	N
p/n	(MHz)	($^{\circ}$)	(mm)	(mm)
SAO2-38	2.25	38	10 x 10	19
SAO2-45	2.25	45	10 x 10	18
SAO2-60	2.25	60	10 x 10	16
SAO2-70	2.25	70	10 x 10	14
SAO2-90	2.25	90	10 x 10	10
SAO4-38	4	38	8 x 10	31
SAO4-45	4	45	8 x 10	30
SAO4-60	4	60	8 x 10	28
SAO4-70	4	70	8 x 10	27
SAO4-90	4	90	8 x 10	23



Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10 x 10	34.0	17.0	27.5	-	-	•	•	•	-	•	-	-	-
8 x 10	34.0	17.0	27.5	-	-	•	•	•	-	•	-	-	-

Single Angle Shear Wave



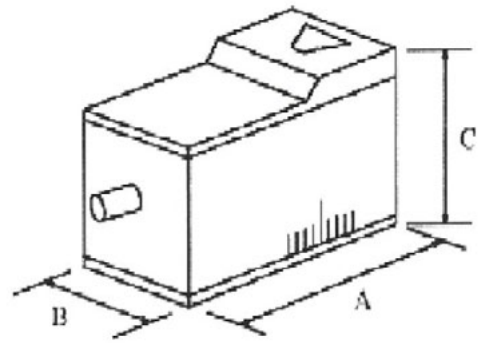
Features

- Single angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Acrylic face.

Frequent Applications

- Castings
- Ceramics
- Forgings
- Machined parts
- Tube & Pipe
- General Welds

Transducer Models				
type	f	Θ	a x b	N
p/n	(MHz)	(°)	(mm)	(mm)
SA2-35	2.3	35	10 x 10	20
SA2-38	2.3	38	10 x 10	19
SA2-45	2.3	45	10 x 10	18
SA2-60	2.3	60	10 x 10	16
SA2-70	2.3	70	10 x 10	15
SA2-80	2.3	80	10 x 10	14
SA2-90	2.3	90	10 x 10	13
SA5-35	4.3	35	8 x 10	34
SA5-38	4.3	38	8 x 10	34
SA5-45	4.3	45	8 x 10	33
SA5-60	4.3	60	8 x 10	31
SA5-70	4.3	70	8 x 10	30
SA5-80	4.3	80	8 x 10	29
SA5-90	4.3	90	8 x 10	28



Size Options		Connector Options												
Probe Size (mm)	Case Dimensions (mm)			Connector Type							Connector Position			
	a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10 x 10	27.0	19.0	16.0	-	-	-	-	•	-	-	•	•	-	-
10 x 10	27.0	19.0	16.0	-	-	-	•	-	-	-	•	•	-	-
10 x 10	27.0	24.0	16.0	-	-	•	-	-	-	-	•	•	-	-
8 x 10	27.0	19.0	16.0	-	-	-	•	•	-	-	•	•	-	-
8 x 10	27.0	19.0	16.0	-	-	-	-	-	-	-	•	•	-	-
8 x 10	27.0	24.0	16.0	-	-	•	-	-	-	-	•	•	-	-

Large Single Angle Shear Wave

LSA

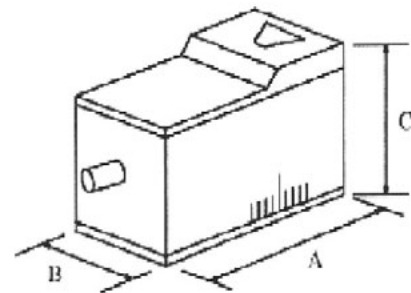


Features

- Single angle beam shear wave contact probe.
- Circular lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Acrylic Face.

Frequent Applications

- Tube & Pipe
- Critical Welds
- General Welds



Transducer Models				
type	f	Θ	\varnothing	N
p/n	(MHz)	($^{\circ}$)	(mm)	(mm)
LSA1-35	1.25	35	20	30
LSA1-45	1.25	45	20	28
LSA1-60	1.25	60	20	24
LSA1-70	1.25	70	20	21
LSA2-35	2.25	35	20	61
LSA2-45	2.25	45	20	59
LSA2-60	2.25	60	20	55
LSA2-70	2.25	70	20	52
LSA2-80	2.25	80	20	49
LSA2-90	2.25	90	20	47
LSA4-35	4	35	20	115
LSA4-45	4	45	20	113
LSA4-60	4	60	20	110
LSA4-70	4	70	20	107

Size Options				Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	\varnothing	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side
20	50.0	26.0	34.0	-	-	•	•	•	-	•	•	-	-

High Temperature Shear Wave

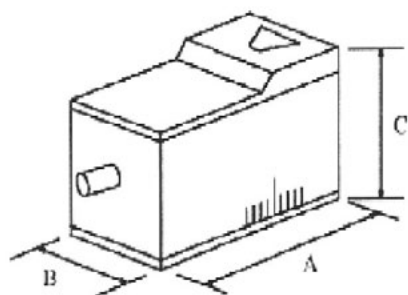


Features

- Single Angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- High temperature shoe.
- Continuous operation at maximum of 100°C.
- Intermittent operation up to 220°C (20 seconds contact and then cool).

Frequent Applications

- Castings
- Forgings
- Critical Welds
- General Welds



Transducer Models				
type	f	Θ	a x b	N
p/n	(MHz)	(°)	(mm)	(mm)
HSA2-45	2.3	45	10 x 10	18
HSA2-60	2.3	60	10 x 10	16
HSA2-70	2.3	70	10 x 10	15
HSA4-45	4.3	45	8 x 10	33
HSA4-60	4.3	60	8 x 10	31
HSA4-70	4.3	70	8 x 10	30

Size Options				Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side
10 x 10	27.0	19.0	16.0	-	-	-	-	•	-	•	•	-	-
10 x 10	27.0	19.0	16.0	-	-	-	•	-	-	•	•	-	-
10 x 10	27.0	24.0	16.0	-	-	•	-	-	-	•	•	-	-
8 x 10	27.0	19.0	16.0	-	-	-	-	•	-	•	•	-	-
8 x 10	27.0	19.0	16.0	-	-	-	•	-	-	•	•	-	-
8 x 10	27.0	24.0	16.0	-	-	•	-	-	-	•	•	-	-

Twin Angle Shear Wave CDA



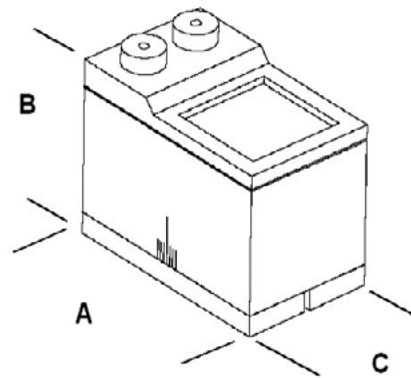
Features

- Dual angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Acrylic face.

Frequent Applications

- Castings
- Forgings
- Tube & Pipe
- Critical Welds
- General Welds

Transducer Models				
type	f	Θ	a × b	F
p/n	(MHz)	(°)	(mm)	(mm)
CDA2-45	2.1	45	10 × 5	22
CDA2-60	2.1	60	10 × 5	20
CDA2-70	2.1	70	10 × 5	19
CDA5-45	4.6	45	8 × 5	22
CDA5-60	4.6	60	8 × 5	21
CDA5-70	4.6	70	8 × 5	20



Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10 × 5	27.0	19.0	16.0	-	-	•	•	•	-	•	-	-	-
8 × 5	27.0	19.0	16.0	-	-	•	•	•	-	•	-	-	-

Sirius Transducer Range

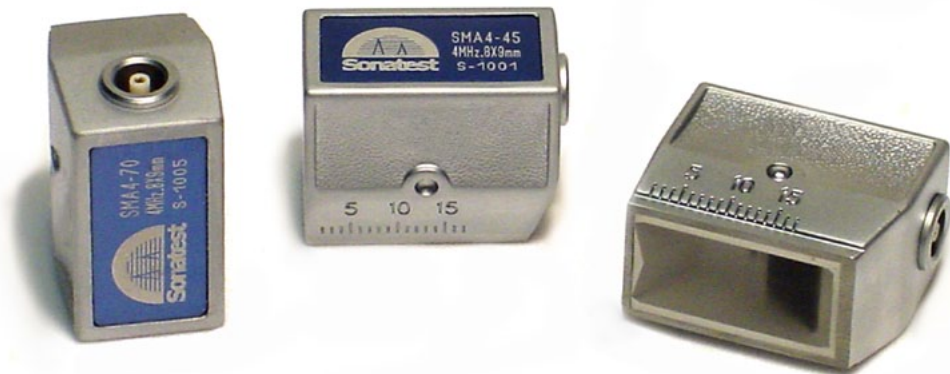
The Sirius Transducer Range is a comprehensive collection of shear and compression wave probes, which include single and dual element probes in 0° and angle beams. This range has been specifically assembled to address the inspection criteria demanded throughout Europe and ROW (excluding USA).

These transducers are offered in European style metal cases with LEMO connectors. The transducer elements are available in standard metric sizes and in frequencies of 2 and 4 MHz. Probe face options include acrylic shoes with metal wear rings for dual and angle beam probes and ceramic and protective membrane faces for single element 0° probes. Possession of a complete set of Sirius transducers would therefore permit a large range of manual inspections to be performed.

Sirius - Small Angle Beam Shear Wave

Features

- Single angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- European Standard transducer.



Transducer Models

type	f	Θ	a × b	N
p/n	(MHz)	(°)	(mm)	(mm)
SMA2-45	2	45	8 × 9	15
SMA2-60	2	60	8 × 9	15
SMA2-70	2	70	8 × 9	17
SMA4-45	4	45	8 × 9	30
SMA4-60	4	60	8 × 9	30
SMA4-70	4	70	8 × 9	30

Frequent Applications

- Castings
- Ceramics
- Forgings
- Machined Parts
- Tube & Pipe
- General Welds

Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
8 × 9	24.0	15.0	22.0	-	-	•	-	-	-	-	•	-	-

Sirius - Medium & Large Angle Beam Shear Wave

MMA



Transducer Models				
type	f	Θ	a x b	N
p/n	(MHz)	(°)	(mm)	(mm)
MMA2-45	2	45	14 x 16	39
MMA2-60	2	60	14 x 16	39
MMA2-70	2	70	14 x 16	39
MMA4-45	4	45	14 x 16	78
MMA4-60	4	60	14 x 16	78
MMA4-70	4	70	14 x 16	78

Size Options		Connector Options												
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
14 x 16	41.0	21.0	29.0	-	-	•	-	-	-	-	-	•	-	-

Features

- Single angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- European Standard transducer.

Frequent Applications

- Castings
- Ceramics
- Forgings
- Machined Parts
- Tube & Pipe
- General Welds
- Critical Welds

LMA



Transducer Models				
type	f	Θ	a x b	N
p/n	(MHz)	(°)	(mm)	(mm)
LMA2-45	2	45	20 x 22	90
LMA2-60	2	60	20 x 22	90
LMA2-70	2	70	20 x 22	90
LMA4-45	4	45	20 x 22	180
LMA4-60	4	60	20 x 22	180
LMA4-70	4	70	20 x 22	180

Size Options		Connector Options												
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
20 x 22	53.5	29.0	44.0	-	-	•	-	-	-	-	-	•	-	-

Sirius - Twin Angle Beam Shear Wave

Frequent Applications

- Castings
- Forgings
- Tube & Pipe
- General Welds
- Critical Welds



Features

- Dual angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- European Standard transducer.

Transducer Models				
type	f	Θ	a x b	F
p/n	(MHz)	(°)	(mm)	(mm)
TSMA4-45	4	45	3.5 x 10	11
TSMA4-60	4	60	3.5 x 10	11
TSMA4-70	4	70	3.5 x 10	11

Size Options		Connector Options											
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
a x b	24.0	15.0	22.0	-	-	•	-	-	-	-	•	-	-

For further information on any of the products shown in this catalogue or from the full Sonatest range of products please contact us:

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We will come back to you with a response directly or one of our partners in our distribution network, local to you, will be in contact.

Sirius - Small/Large Single Compression Ceramic Face

SHM & LHM



Frequent Applications

- Ceramics
- Composites
- Machined Parts
- Thickness

Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- Medium damped for medium bandwidth.
- European Standard Transducer.

Transducer Models - SHM			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
SHM2-10	2	10	8
SHM4-10	4	10	17

Transducer Models - LHM			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
LHM2-24	2	24	49
LHM4-24	4	24	97

Size Options	SHM			Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10	23.0	20.0	42.0	-	-	•	-	-	-	-	-	•	-

Size Options	LHM			Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
24	32.0	45.0	59.0	-	•	-	-	-	-	-	-	•	-

Sirius - Small/Large Single Compression Replaceable Membrane



Frequent Applications

- Bars
- Billets
- Bond Testing
- Castings
- Lamination
- Forgings

Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- Medium damped for medium bandwidth.
- European Standard Transducer.

Transducer Models - SMM			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
SMM2-10	2	10	8
SMM4-10	4	10	17

Transducer Models - LMM			
type	f	∅	N
p/n	(MHz)	(mm)	(mm)
LMM 1-24	1	24	24
LMM 2-24	2	24	49
LMM 4-24	4	24	97

Size Options		SMM			Connector Options									
Probe Size (mm)		Case Dimensions (mm)			Connector Type						Connector Position			
∅		A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10		23.0	20.0	42.0	-	-	•	-	-	-	-	-	•	-

Size Options		LMM			Connector Options									
Probe Size (mm)		Case Dimensions (mm)			Connector Type						Connector Position			
∅		A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
24		32.0	45.0	60.0	-	•	-	-	-	-	-	-	•	-

Sirius - Twin Compression Combined Double

THM



Frequent Applications

- Aerospace
- Bars
- Billets
- Bond Testing
- Castings
- Ceramics
- Composites
- Lamination
- Forgings
- Machined Parts
- Thickness
- Tube & Pipe
- White Metal

Features

- Dual normal beam compression wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- European Standard Transducer.

Transducer Models			
type	f	∅/ a × b	N
p/n	(MHz)	(mm)	(mm)
THM2-10	2	11	20
THM2-24	2	7 × 18	25
THM4-10	4	3.5 × 10	7
THM4-24	4	6 × 20	16

Size Options		Connector Options												
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	∅/ a × b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
11	20.0	25.0	45.0	-	-	•	-	-	-	-	-	-	•	-
7 × 18	32.0	45.0	60.0	-	-	•	-	-	-	-	-	-	•	-
3.5 × 10	20.0	25.0	45.0	-	-	•	-	-	-	-	-	-	•	-
6 × 20	32.0	45.0	60.0	-	-	•	-	-	-	-	-	-	•	-

Immersion Transducers

Features

- Single normal beam compression wave.
- Circular, lead metaniobate crystal.
- Medium damped for general use (SLIM).
- High damped for best resolution (SLIH).
- Epoxy face.



Frequent Applications

- Aerospace
- Forgings
- Machined Parts
- Tube & Pipe

Transducer Models SLIM & SLIH					Focusing		
SLIM	SLIH	f	∅	N	Min	Max	Standard Options
p/n		(MHz)	(mm)	(mm)	(mm)	(mm)	(mm)
SLIM2-10	SLIH2-10	2.25	10	38	21	25	25
SLIM2-15	SLIH2-15	2.25	15	85	28	50	30,40,50
SLIM2-25	SLIH2-25	2.25	25	237	50	150	50,60,70,80,100
SLIM5-5	SLIH5-5	5	5	21	10	15	15
SLIM5-10	SLIH5-10	5	10	84	21	75	30,40,50,60,70
SLIM5-15	SLIH5-15	5	15	190	28	100	30,40,50,60,70,80,100
SLIM5-25	SLIH5-25	5	25	527	56	200	60,70,80,100
SLIM10-5	SLIH10-5	10	5	42	20	30	25
SLIM10-10	SLIH10-10	10	10	168	21	100	30,40,50,60,70,80,100
SLIM15-5	SLIH15-5	15	15	63	21	50	30,40,50
SLIM15-10	SLIH15-10	15	10	253	21	150	30,40,50,60,70,80,100

Size Options		Connector Options												
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position				
	∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
5	16.0	35.0	13.0	-	-	-	-	-	-	•	•	-	-	-
10	16.0	35.0	13.0	-	-	-	-	-	-	•	•	-	-	-
15	25.0	35.0	13.0	-	-	-	-	-	-	•	•	-	-	-
25	35.0	35.0	13.0	-	-	-	-	-	-	•	•	-	-	-

Spherical (or point focus) or cylindrical (or line focus) is available as an extra on immersion probes. Probes can be cylindrically or spherically focused at any focal length between the stated minimum and maximum values (note the maximum focal length is always less than the natural nearfield length of the equivalent unfocused probe), however standard focal lengths are offered, as in practice the focal region extends over a region of finite extend which generally means that no significant additional benefit is achieved by specifying a focal length better than to the nearest 10 mm (or 0.5").

Example of Part No: SLIH5-10 (unfocussed)
 SLIH5-10CF40 (cylindrically focussed at 40mm in water)
 SLIH5-10SF40 (spherically focussed at 40mm in water)

Sonatest Inc

Based in San Antonio, Texas, USA, Sonatest Inc also manufacture a complete range of high performance, high technology transducers used in general flaw detection and thickness measurement applications. Each transducer is made to exacting standards regarding acoustic, electronic and mechanical properties. As with all Sonatest transducers each unit is thoroughly tested at three stages of manufacture. The complete range of transducer types are available with a variety of connector styles, case configurations, frequencies and element sizes.

The following pages present the core range of transducers available from Sonatest Inc. If you cannot source here what you require please contact us for further information on other configurations of transducers that are available. Sonatest Inc have a dedicated and specialised team who are also able to design and build probes to meet specific requirements and applications.

For further information on any of the products shown in this catalogue or from the full Sonatest range of products please contact us:

Sonatest Ltd (UK)

email: sales @sonatest.com tel: +44 (0)1908 316345

Sonatest Inc (USA)

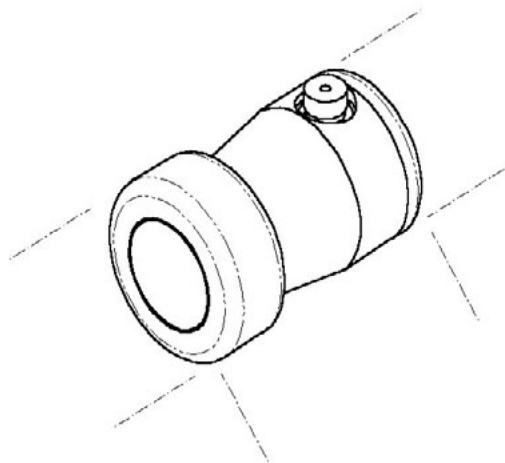
email: sales@sonatestinc.com tel: +1 (210) 697 0335

www.sonatest.com

We will come back to you with a response directly or one of our partners in our distribution network, local to you, will be in contact.

Single Compression High Damped

SLM & PSLM



Transducer Models SLM & PSLM				
SLM	PSLM	f	Ø	N
p/n	p/n	(MHz)	(")	(")
-	PSLM10.5	0.5	1	0.5
-	PSLM50.5	0.5	1/2	0.1
-	PSLM501	1	1/2	0.3
-	PSLM751	1	3/4	0.6
-	PSLM101	1	1	1.1
SLM5025	PSLM5025	2.25	1/2	0.6
SLM7525	PSLM7525	2.25	3/4	1.4
SLM1025	PSLM1025	2.25	1	2.4
-	PSLM503.5	3.5	1/2	0.9
-	PSLM753.5	3.5	3/4	2.1
-	PSLM103.5	3.5	1	3.7
-	PSLM1040	4	1	4.3
SLM5050	PSLM5050	5	1/2	1.3
SLM7550	PSLM7550	5	3/4	3.0
SLM1050	PSLM1050	5	1	5.4

Features

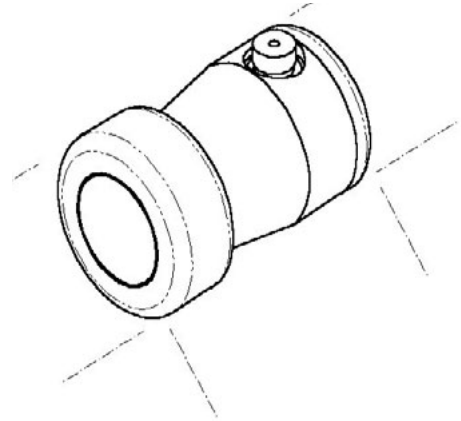
- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal (SLM).
- Circular, composite crystal (PSLM).
- Medium damped for general use (SLM).
- High damped for wide bandwidth (PSLM)
- Ceramic wear face and steel wear ring to prolong service life.
- Stainless steel ergonomic case for good grip and ease of use.

Frequent Applications

- Ceramics
- Composites
- Machined parts

Size Options				Connector Options									
Probe Size	Case Dimensions			Connector Type						Connector Position			
Ø (")	A (")	B (")	C (")	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/2	1.0	1.3	1.0	•	•	•	-	-	-	-	-	•	-
3/4	1.3	1.6	1.1	•	•	•	-	-	-	-	-	•	-
1	1.4	1.5	1.3	•	•	•	-	-	-	-	-	•	-

Single Compression Replaceable Membrane SLF & PSLF



Frequent Applications

- Casting & Forgings
- Bars & Billets
- Bond Testing
- Laminations

Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal (SLF).
- Circular, composite crystal (PSLF)
- Medium damped for general use (SLF)
- Polymer membrane protected face facilitates coupling with minimum couplant.
- Ceramic wear face and steel wear ring to prolong service life.
- Stainless steel ergonomic case for good grip and ease of use.
- Delay Lines available.
- High resolution (SLFHR) available upon request.

Transducer Models - SLF & PSLF				
SLF	PSLF	f	∅	N
p/n	p/n	(MHz)	(")	(")
-	PSLF10.5	0.5	1	0.5
-	PSLF101	1	1	1.1
SLF1025	PSLF1025	2.25	1	2.4
	PSLF1035	3.5	1	3.7
	PSLF1040	4	1	4.3
SLF1050	PSLF1050	5	1	5.4
	PSLF50.5	0.5	0.5	0.1
	PSLF501	1	0.5	0.3
SLF5025	PSLF5025	2.25	0.5	0.6
	PSLF503.5	3.5	0.5	0.9
	PSLF5040	4	0.5	1.1
SLF5050	PSLF5050	5	0.5	1.3

Size Options	SLF & PSLF			Connector Options							Connector Position			
Probe Size	Case Dimensions			Connector Type							Connector Position			
∅ (")	A (")	B (")	C (")	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable	
1/2	1.0	1.3	1.0	•	•	•	-	-	-	-	-	•	-	
3/4	1.3	1.6	1.1	•	•	•	-	-	-	-	-	•	-	
1	1.4	1.5	1.3	•	•	•	-	-	-	-	-	•	-	

Fingertip Contact Transducers

FCR, FCG & PFC



Frequent Applications

- Casting & Forgings
- Bars & Billets
- Bond Testing
- Laminations
- Machined Parts

Transducer Models FCR, FCG, PFC					
FCR (Resolution)	FCG (Gain)	PFC (Platinum)	f	∅	N
p/n	p/n	p/n	(MHz)	(")	(")
-	-	PFC501	1	1/2	0.3
FCR2525	FCG2525	PFC2525	2.25	1/4	0.2
FCR3725	FCG3725	PFC3725	2.25	3/8	0.3
FCR5025	FCG5025	PFC5025	2.25	1/2	0.6
FCR1250	FCG1250	PFC1250	5	1/8	0.1
FCR2550	FCG2550	PFC2550	5	1/4	0.3
FCR3750	FCG3750	PFC3750	5	3/8	0.8
FCR5050	FCG5050	PFC5050	5	1/2	1.3
FCR1210	FCG1210	PFC1210	10	1/8	0.2
FCR2510	FCG2510	PFC2510	10	1/4	0.7
FCR3710	FCG3710	PFC3710	10	3/8	0.8
FCR5010	FCG5010	PFC5010	10	1/2	2.7

Features

- Single normal beam compression wave contact probe.
- Circular, lead metaniobate crystal.
- High damped for wide bandwidth (FCR & PFC).
- Medium damped for medium bandwidth (FCG).
- Ceramic wear face and steel wear ring to prolong service life.
- Stainless steel ergonomic case for good grip and ease of use.

Size Options	FCR, FCG, PFC			Connector Options						Connector Position			
Probe Size	Case Dimensions			Connector Type						Connector Position			
∅ (")	A (")	B (")	C (")	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/8 SL	0.3	0.7	0.4	-	-	-	•	-	-	-	-	•	-
1/8	0.3	0.8	0.5	-	-	-	•	-	-	-	-	•	-
1/4	0.4	1.0	0.6	-	-	-	•	-	-	-	-	•	-
3/8	0.5	1.0	0.6	-	-	-	•	-	-	-	-	•	-
1/2	0.6	1.0	0.8	-	-	-	•	-	-	-	-	•	-
3/4	0.9	1.1	1.0	-	-	-	•	-	-	-	-	•	-

Quick Change Shearwave Transducers & Wedges

QCR, QCG, PQC & QW



Frequent Applications

- Aerospace
- Castings
- Forgings
- Machined parts
- Critical welds
- White metal

Transducer Features

- Single angle beam shear wave contact probe.
- Circular, lead metaniobate crystal.
- High damped for wide bandwidth (QCR/PQC)
- Medium damped for medium bandwidth (QCG).
- Screw thread for quick change use with threaded QW wedges.
- Platinum Series has circular composite crystal.

Wedge Features

- Threaded quick change wedge for use with QCR, QCG and PQC transducers.
- Wedge beam shear wave contact probe.
- Axial and circumferential ID or OD profiling available.

Transducer Models				
QCR (Resolution)	QCG (Gain)	PQC (Platinum)	f	∅
p/n			(MHz)	(")
QCR2525	QCG2525	PQC2525	2.25	1/4
QCR3725	QCG3725	-	2.25	3/8
QCR5025	QCG5025	PQC5025	2.25	1/2
-	-	PQC503.5	3.5	1/2
QCR2550	QCG2550	PQC2550	5	1/4
-	-	PQC3725	2.25	3/8
QCR3750	QCG3750	PQC3750	5	3/8
QCR5050	QCG5050	PQC5050	5	1/2
QCR2510	QCG2510	PQC2510	10	1/4
QCR3710	QCG3710	-	10	3/8

Wedge Models*					
Part No.	Wedge Dimensions (in)				
p/n	∅ (°)	∅ (")	A (")	B (")	C (")
QW2545	45	1/4	0.5	0.8	0.4
QW3745	45	3/8	0.6	1.0	0.5
QW5045	45	1/2	0.9	1.1	0.6
QW2560	60	1/4	0.5	0.9	0.5
QW3760	60	3/8	0.6	1.1	0.6
QW5060	60	1/2	0.9	1.3	0.7
QW2570	70	1/4	0.5	0.98	0.5
QW3770	70	3/8	0.6	1.2	0.61
QW5070	70	1/2	0.87	1.46	0.73

* Wedges for refracted longitudinal waves are also available, order part number with suffix RL e.g QW2545RL

Size Options	QCR, QCG & PQC		Connector Options									
Probe Size	Case Dimensions		Connector Type						Connector Position			
∅ (")	L (")	∅ (")	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/4	0.75	0.50	-	-	-	•	-	-	•	-	-	-
3/8	0.75	0.57	-	-	-	•	-	-	•	-	-	-
1/2	0.75	0.68	-	-	-	•	-	-	•	-	-	-

Miniature Shearwave Transducers & Wedges

MSR, MSG or PMS

Frequent Applications

- Ceramics
- Forgings
- Tube & Pipe
- Critical Welds
- General Welds



Transducer Features

- Single angle beam shear wave contact probe.
- Circular, lead metaniobate crystal.
- High damped for wide bandwidth (MSR/PMS).
- Medium damped for medium bandwidth (MSG).
- Captive screws for attaching to wedge.

Wedge Features

- Wedge beam shear wave contact probe.
- Attached by screws to MSR, MSG and PMS transducers. 1-64 threaded holes.
- Axial and circumferential ID or OD profiling available.

Transducer Models				
MSR (Resolution)	MSG (Gain)	PMS (Platinum)	f	∅
p/n			(MHz)	(")
MSR2525	MSG2525	PMS2525	2.25	1/4
MSR3725	MSG3725	-	2.25	3/8
MSR5025	MSG5025	PMS5025	2.25	1/2
-	-	PMS503.5	3.5	1/2
MSR2550	MSG2550	PMS2550	5	1/4
-	-	PMS3725	2.25	3/8
MSR3750	MSG3750	PMS3750	5	3/8
MSR5050	MSG5050	PMS5050	5	1/2
MSR2510	MSG2510	PMS2510	10	1/4
MSR3710	MSG3710	-	10	3/8

Wedge Models					
Part No.	Wedge Dimensions (in)				
p/n	∅ (°)	∅ (")	A (")	B (")	C (")
MW2545	45	1/4	0.5	0.7	0.4
MW3745	45	3/8	0.6	1.0	0.5
MW5045	45	1/2	0.9	1.0	0.5
MW2560	60	1/4	0.5	0.8	0.4
MW3760	60	3/8	0.6	0.9	0.5
MW5060	60	1/2	0.8	1.1	0.6
MW2570	70	1/4	0.5	0.87	0.43
MW3770	70	3/8	0.62	1.2	0.62
MW5070	70	1/2	0.88	1.2	0.6

Size Options	MSR, MSG & PMS			Connector Options									
Probe Size	Case Dimensions			Connector Type						Connector Position			
∅ (")	H (")	∅ ₁ (")	∅ ₂ (")	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/4	0.50	0.50	0.41	-	-	-	•	-	-	•	-	-	-
3/8	0.56	0.56	0.50	-	-	-	•	-	-	•	-	-	-
1/2	0.56	0.75	0.63	-	-	-	•	-	-	•	-	-	-

Standard Shearwave Transducers

SSR, SSG or PSS

Features

- Single angle beam shear wave contact probe.
- Rectangular lead metaniobate titanate crystal.
- Medium damped for medium bandwidth (SSR).
- Low damped for narrow bandwidth (SSG).
- Composite crystal for wide bandwidth (PSS).
- Attached by screws to SW or SNW wedges.
- AWS structural weld code style.



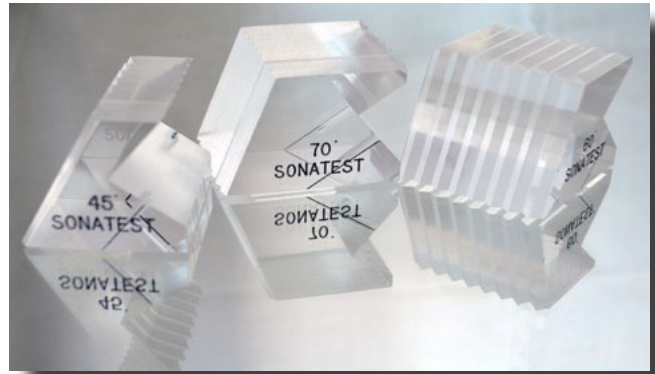
Frequent Applications

- Critical Welds
- General Welds

Transducer Models				
SSR (Resolution)	SSG (Gain)	PSS (Platinum)	f	a x b
p/n			(MHz)	(")
-	-	PSS50501	1	1/2 x 1/2
SSR50502	SSG50502	PSS50502	2.25	1/2 x 1/2
SSR50505	SSG50505	PSS50505	5	1/2 x 1/2
-	-	PSS50101	1	1/2 x 1
SSR50102	SSG50102	PSS50102	2.25	1/2 x 1
SSR50105	SSG50105	PSS50105	5	1/2 x 1
-	-	PSS62621	1	5/8 x 5/8
SSR62622	SSG62622	PSS62622	2.25	5/8 x 5/8
SSR62625	SSG62625	PSS62625	5	5/8 x 5/8
-	-	PSS62751	1	3/4 x 5/8
SSR62752	SSG62752	PSS62752	2.25	3/4 x 5/8
SSR62755	SSG62755	PSS62755	5	3/4 x 5/8
-	-	PSS75751	1	3/4 x 3/4
SSR75752	SSG75752	PSS75752	2.25	3/4 x 3/4
SSR75755	SSG75755	PSS75755	5	3/4 x 3/4

Size Options	SSR, SSG & PSS			Connector Options									
Probe Size (ins)	Case Dimensions (ins)			Connector Type						Connector Position			
∅ (")	A (")	B (")	C (")	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/2 x 1/2	0.8	1.1	0.7	•	-	-	-	-	-	•	-	-	-
1/2 x 1	0.8	1.6	0.7	•	-	-	-	-	-	•	-	-	-
5/8 x 5/8	0.9	1.3	0.7	•	-	-	-	-	-	•	-	-	-
3/4 x 5/8	0.9	1.3	0.7	•	-	-	-	-	-	•	-	-	-
3/4 x 3/4	0.9	1.3	0.7	•	-	-	-	-	-	•	-	-	-

Standard Wedges **SW**



Features

- Attached by screws to SSR, SSG or PSS transducers. 4-40 threaded holes.
- Axial and circumferential ID or OD profiling available.
- High temperature wedges available.

Wedge Model - SW, SW-HT		
type	Θ	a x b
p/n	(°)	(")
SW5045 (HT)	45	1/2 x 1/2
SW5060 (HT)	60	1/2 x 1/2
SW5070 (HT)	70	1/2 x 1/2
SW5090 (HT)	90	1/2 x 1/2
SW5145 (HT)	45	1/2 x 1
SW5160 (HT)	60	1/2 x 1
SW5170 (HT)	70	1/2 x 1
SW5190 (HT)	90	1/2 x 1
SW6245 (HT)	45	5/8 x 5/8
SW6260 (HT)	60	5/8 x 5/8
SW6270 (HT)	70	5/8 x 5/8
SW6290 (HT)	90	5/8 x 5/8
SW6245 (HT)	45	3/4 x 5/8
SW6260 (HT)	60	3/4 x 5/8
SW6270 (HT)	70	3/4 x 5/8
SW6290 (HT)	90	3/4 x 5/8

Size Options	SW		
Part No.	Wedge Dimensions (ins)		
a x b (")	A (")	B (")	C (")
1/2 x 1/2	0.5	0.5	0.7
1/2 x 1	0.5	1.0	0.7
5/8 x 5/8	0.6	0.6	0.7
3/4 x 5/8	0.8	0.6	0.7
3/4 x 3/4	0.8	0.8	0.7

Wedge Model - SNW		
type	Θ	a x b
p/n	(°)	(")
SNW6245	45	5/8 x 5/8
SNW6260	60	5/8 x 5/8
SNW6270	70	5/8 x 5/8

Size Options	SNW		
Part No.	Wedge Dimensions (ins)		
a x b (")	A (")	B (")	C (")
5/8 x 5/8	0.6	0.6	0.7

Snail Wedges **SNW**



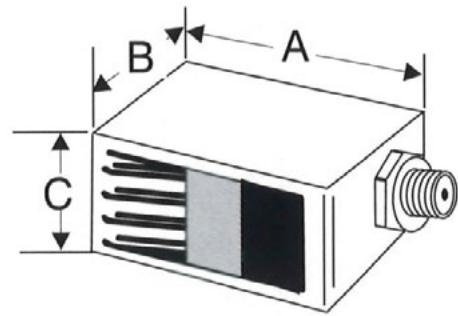
Features

- Attached by screws to SSR, SSG or PSS transducers. 4-40 threaded holes.
- Axial and circumferential ID or OD profiling available.
- AWS structural weld code style.

NB: 5/8 x 5/8 SW, SW-HT and SNW wedges are also compatible with X5 (X Series) phased array probes. 4-40 screws are required for this.

Miniature Angle Beam Potted

MAP & PMAP



Transducer Models				
MAP	PMAP(Platinum)	f	Θ	a x b
p/n		(MHz)	($^{\circ}$)	(")
MAP2525245	PMAP2525245	2.25	45	1/4 x 1/4
MAP2525260	PMAP2525260	2.25	60	1/4 x 1/4
MAP2525270	PMAP2525270	2.25	70	1/4 x 1/4
MAP2525545	PMAP2525545	5	45	1/4 x 1/4
MAP2525560	PMAP2525560	5	60	1/4 x 1/4
MAP2525570	PMAP2525570	5	70	1/4 x 1/4
MAP25251045	PMAP25251045	10	45	1/4 x 1/4
MAP25251060	PMAP25251060	10	60	1/4 x 1/4
MAP25251070	PMAP25251070	10	70	1/4 x 1/4
MAP3737245	PMAP3737245	2.25	45	3/8 x 3/8
MAP3737260	PMAP3737260	2.25	60	3/8 x 3/8
MAP3737270	PMAP3737270	2.25	70	3/8 x 3/8
MAP3737545	PMAP3737545	5	45	3/8 x 3/8
MAP3737560	PMAP3737560	5	60	3/8 x 3/8
MAP3737570	PMAP3737570	5	70	3/8 x 3/8
MAP37371045	PMAP37371045	10	45	3/8 x 3/8
MAP37371060	PMAP37371060	10	60	3/8 x 3/8
MAP37371070	PMAP37371070	10	70	3/8 x 3/8
MAP5050245	PMAP5050245	2.25	45	1/2 x 1/2
MAP5050260	PMAP5050260	2.25	60	1/2 x 1/2
MAP5050270	PMAP5050270	2.25	70	1/2 x 1/2
MAP5050545	PMAP5050545	5	45	1/2 x 1/2
MAP5050560	PMAP5050560	5	60	1/2 x 1/2
MAP5050570	PMAP5050570	5	70	1/2 x 1/2
MAP50501045	PMAP50501045	10	45	1/2 x 1/2
MAP50501060	PMAP50501060	10	60	1/2 x 1/2
MAP50501070	PMAP50501070	10	70	1/2 x 1/2

Features

- Single angle beam shear wave contact probe.
- Rectangular, lead metaniobate crystal.
- Medium damped for medium bandwidth.
- Integral wedge angle beam transducer.

Frequent Applications

- Castings
- Tube & Pipe
- Critical Welds
- General Welds

Size Options	MAP & PMAP			Connector Options MAP & PMAP						Connector Position			
Probe Size (")	Case Dimensions (")			Connector Type						Connector Position			
a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
3/16 x 3/16	0.8	0.6	0.4	-	-	•	•	-	-	•	•	-	-
1/4 x 1/4	0.8	0.7	0.4	-	-	•	•	-	-	•	•	-	-
3/8 x 3/8	1.0	0.7	0.4	-	-	•	•	-	-	•	•	-	-
1/2 x 1/2	1.2	0.9	0.4	-	-	•	•	-	-	•	•	-	-

Micro Miniature Angle Beam Potted

MMAP & PMMAP

Features

- Single angle beam shear wave contact probe.
- Rectangular, lead metaniobate crystal.
- Medium damped for medium bandwidth.
- Miniature Integral wedge angle.

Frequent Applications

- Aerospace & Composites
- Critical Welds

Transducer Models				
MMAP		f	Θ	a x b
p/n		(MHz)	(°)	(")
MMAP1212545	PMMAP1212545	5	45	1/8 x 1/8
MMAP1212560	PMMAP1212560	5	60	1/8 x 1/8
MMAP1212570	PMMAP1212570	5	70	1/8 x 1/8
MMAP1818545	PMMAP1818545	5	45	3/16 x 3/16
MMAP1818560	PMMAP1818560	5	60	3/16 x 3/16
MMAP1818570	PMMAP1818570	5	70	3/16 x 3/16
MMAP12121045	PMMAP12121045	10	45	1/8 x 1/8
MMAP12121060	PMMAP12121045	10	60	1/8 x 1/8
MMAP12121070	PMMAP12121045	10	70	1/8 x 1/8
MMAP18181045	PMMAP18181045	10	45	3/16 x 3/16
MMAP18181060	PMMAP18181060	10	60	3/16 x 3/16
MMAP18181070	PMMAP18181070	10	70	3/16 x 3/16

Size Options	MMAP & PMMAP			Connector Options MMAP & PMMAP									
Probe Size (")	Case Dimensions (")			Connector Type						Connector Position			
a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/8 x 1/8	0.4	0.4	0.3	-	-	-	•	-	-	•	•	-	-
3/16 x 3/16	0.6	0.6	0.5	-	-	-	•	-	-	•	•	-	-

Features

- Large Integral wedge angle beam transducer.
- Optional irrigation channels.

Large Angle Beam Potted

LAP & PLAP

Frequent Applications • Tube & Pipe • Critical Welds • General Welds

Transducer Models			
LAP	f	Θ	a x b
p/n	(MHz)	(°)	(")
LAP7510270	2	70	0.75 x 1
LAP7510545	2	45	0.75 x 1
LAP7510570	2	70	0.75 x 1
PLAP7510160	1	60	0.75 x 1
PLAP7510290	2	90	0.75 x 1
PLAP75103.545	3.5	45	0.75 x 1



Size Options	LAP			Connector Options LAP									
Probe Size (")	Case Dimensions (")			Connector Type						Connector Position			
a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1 x 1	2.00	2.00	0.77	•	•	•	•	-	-	•	•	-	-

Dual Element Transducers

DEM & PDEM



Features

- Dual normal beam compression wave contact probe.
- Lead metaniobate crystal (DEM).
- Composite Crystal (PDEM).
- Medium damped for medium bandwidth.

Transducer Models		
DEM	f	Ø
p/n	(MHz)	(")
DEM2525	2.25	1/4
DEM3725	2.25	3/8
DEM5025	2.25	1/2
DEM7525	2.25	3/4
DEM2550	5	1/4
DEM3750	5	3/8
DEM5050	5	1/2
DEM7550	5	3/4
DEM2510	10	1/4
DEM3710	10	3/8
DEM5010	10	1/2

Transducer Models		
PDEM	f	Ø
p/n	(MHz)	(")
PDEM251	1	1/4
PDEM371	1	3/8
PDEM501	1	1/2
PDEM751	1	3/4
PDEM2525	2.25	1/4
PDEM3725	2.25	3/8
PDEM5025	2.25	1/2
PDEM7525	2.25	3/4
PDEM2550	5	1/4
PDEM3750	5	3/8
PDEM5050	5	1/2
PDEM2510	10	1/4

Frequent Applications

- Aerospace
- Bars & Billets
- Bond Testing
- Castings
- Ceramics
- Composites
- Lamination
- Forgings
- Machined Parts
- Thickness
- Tube & Pipe
- White Metals

Size Options	DEM & PDEM			Connector Options DEM									
Probe Size (")	Case Dimensions (")			Connector Type						Connector Position			
Ø	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/4	0.4	1.00	0.57	-	-	-	•	-	-	•	-	•	-
3/8	0.5	1.00	0.63	-	-	-	•	-	-	•	-	•	-
1/2	0.64	1.00	0.75	-	-	-	•	-	-	•	-	•	-
3/4	0.87	1.10	1.00	-	-	-	•	-	-	•	-	•	-

Different shoe materials available upon request.

Dual Element Integral Cable Transducers **DEI & PDEI** Fixed Delay Line Transducers **PD**

Features

- Dual normal beam compression wave contact probes.
- Lead metaniobate crystal (DEI/PD).
- Medium damped for medium bandwidth (DEI/PD).
- Composite Crystal (PDEI).
- High damped for wide bandwidth (PDEI).
- Cable connection entry can be at the side or top.



Transducer Models		
DEI	f	Ø
p/n	(MHz)	(")
DEI2525	2.25	1/4
DEI3725	2.25	3/8
DEI5025	2.25	1/2
DEI7525	2.25	3/4
DEI2550	5	1/4
DEI3750	5	3/8
DEI5050	5	1/2
DEI7550	5	3/4
DEI2510	10	1/4
DEI3710	10	3/8
DEI5010	10	1/2

Transducer Models		
PDEI	f	Ø
p/n	(MHz)	(")
PDEI251	1	1/4
PDEI371	1	3/8
PDEI501	1	1/2
PDEI751	1	3/4
PDEI2525	2.25	1/4
PDEI3725	2.25	3/8
PDEI5025	2.25	1/2
PDEI7525	2.25	3/4
PDEI2550	5	1/4
PDEI3750	5	3/8
PDEI5050	5	1/2
PDEI7550	5	3/4
PDEI2510	10	1/4

Frequent Applications

- Aerospace
- Bond Testing
- Brazed Joints
- Machined Parts
- Thickness
- Tube & Pipe
- White Metals

Size Options	DEI, PDEI, PD			Connector Options DEM									
Probe Size (")	Case Dimensions (")			Connector Type						Connector Position			
a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/4	0.4	1.00	0.57	•	•	-	-	-	-	•	•	-	•
3/8	0.5	1.00	0.63	•	•	-	-	-	-	•	•	-	•
1/2	0.64	1.00	0.75	•	•	-	-	-	-	•	•	-	•
3/4	0.87	1.10	1.00	•	•	-	-	-	-	•	•	-	•

Delay Line Transducers

RDT & PD



Features

- Single normal beam compression wave contact probe.
- Provide excellent near surface resolution.
- Circular lead metaniobate crystal.
- High damped for wide bandwidth.
- Rexolite Delayline.
- Special sizes, high temperature delay lines are available on request.

Frequent Applications

- Aerospace
- Bond Testing
- Composites
- Glass
- Brazed Joints
- Machined Parts
- Thickness
- Tube & Pipe

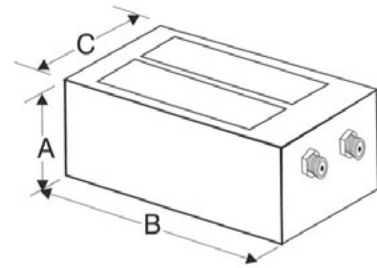
Transducer Models RDT		
RDT	f	∅
p/n	(MHz)	(")
PRDT501 (composite)	1	1/2
RDT2525	2.25	1/4
RDT5025	2.25	1/2
RDT1250	5	1/8
RDT2550	5	1/4
RDT5050	5	1/2
RDT1210	10	1/8
RDT2510	10	1/4
RDT5010	10	1/2
RDT1215	15	1/8
RDT2515	15	1/4
RDT1220	20	1/8
RDT2520	20	1/4

Transducer Models PD		
PD	f	∅
p/n	(MHz)	(")
PD2510	10	1/4
PD2515	15	1/4

Size Options	RDT			Connector Options RDT									
Probe Size (")	Case Dimensions (")			Connector Type						Connector Position			
∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/8	1.00	0.51	0.40	-	-	-	•	-	-	•	-	•	-
1/4	1.00	0.51	0.51	-	-	-	•	-	-	•	-	•	-
1/2	1.55	0.77	0.77	-	-	-	•	-	-	•	-	•	-

Standard replacement delay tips are available in packs of three - DT12 / DT25 / DT50

Dual Shearwave CDA Inc



Transducer Models			
CDA Inc p/n	f (MHz)	Θ ($^{\circ}$)	a x b ($^{\circ}$)
CDA2525245	2.25	45	1/4 x 1/4
CDA2525260	2.25	60	1/4 x 1/4
CDA2525270	2.25	70	1/4 x 1/4
CDA3737245	2.25	45	3/8 x 3/8
CDA3737260	2.25	60	3/8 x 3/8
CDA3737270	2.25	70	3/8 x 3/8
CDA5050245	2.25	45	1/2 x 1/2
CDA5050260	2.25	60	1/2 x 1/2
CDA5050270	2.25	70	1/2 x 1/2
CDA2525545	5	45	1/4 x 1/4
CDA2525560	5	60	1/4 x 1/4
CDA2525570	5	70	1/4 x 1/4
CDA3737545	5	45	3/8 x 3/8
CDA3737560	5	60	3/8 x 3/8
CDA3737570	5	70	3/8 x 3/8
CDA5050545	5	45	1/2 x 1/2
CDA5050560	5	60	1/2 x 1/2
CDA5050570	5	70	1/2 x 1/2

Features

- Dual angle beam shear wave contact probe.
- Rectangular lead metaniobate crystal.
- Medium damped for medium bandwidth.
- Acrylic shoe.
- Special sizes available upon request.

Frequent Applications

- Castings
- Forgings
- Tube & Pipe
- General Welds
- Critical Welds

Size Options Probe Size ($^{\circ}$)	CDA Inc Case Dimensions ($^{\circ}$)			Connector Options CDA Inc									
	A	B	C	Connector Type						Connector Position			
a x b	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/4 x 1/4	1.0	1.0	0.5	-	-	-	•	-	-	•	•	-	-
3/8 x 3/8	1.0	1.0	0.6	-	-	-	•	-	-	•	•	-	-
1/2 x 1/2	1.0	1.2	0.8	-	-	-	•	-	-	•	•	-	-

* Also available as probes for refracted longitudinal waves - order part number with suffix RL e.g CD2525245RL

Immersion Transducers

IMR, IMG or PIM



Features

- Single immersion beam compression wave immersion probe.
- Circular, lead metaniobate crystal.
- High damped for wide bandwidth (IMR).
- Medium damped for medium bandwidth (IMG).
- Composite crystal for wide bandwidth, high output (PIM).
- Spherical (point focus) or Cylindrical (line focus) available as an extra option.

Frequent Applications

- Ceramics
- Composites
- Machined Parts
- Thickness

Transducer Models					Focusing			
IMR (Resolution)	IMG (Gain)	PIM (Platinum)	f	∅	N	Min	Max	Std Options
p/n			(MHz)	(")	(")	(")	(")	(")
-	-	PIM501	1	1/2	1.1	0.7	1.0	1
-	-	PIM751	1	3/4	2.4	1.25	2.0	1½, 2
-	-	PIM101	1	1	4.3	1.8	3.2	2, 2½, 3
IMR2525	IMG2525	PIM2525	2.25	1/4	0.6	0.4	0.5	½
IMR3725	IMG3725	PIM3725	2.25	3/8	1.4	0.8	1.0	1
IMR5025	IMG5025	PIM5025	2.25	1/2	2.4	0.9	2.0	1, 1½, 2
IMR7525	IMG7525	PIM7525	2.25	3/4	5.4	1.25	4.0	1½, 2, 2½, 3, 3½, 4
IMR1025	IMG1025	PIM1025	2.25	1	9.7	1.9	6.0	2, 2½, 3, 3½, 4
IMR2550	IMG2550	PIM2550	5	1/4	1.3	0.5	1.0	½
IMR3750	IMG3750	PIM3750	5	3/8	3.0	0.7	1.7	1, 1½
IMR5050	IMG5050	PIM5050	5	1/2	5.4	0.9	4.0	1, 1½, 2, 2½, 3, 3½, 4
IMR7550	IMG7550	PIM7550	5	3/4	12.1	1.25	8.0	1½, 2, 2½, 3, 3½, 4
IMR1050	IMG1050	PIM1050	5	1	21.5	2.0	8.0	2, 2½, 3, 3½, 4
IMR2510	IMG2510	PIM2510	10	1/4	2.7	0.5	2.0	½, 1, 1½, 2
IMR3710	IMG3710	-	10	3/8	6.0	0.7	4.0	1, 1½, 2, 2½, 3, 3½, 4
IMR5010	IMG5010	-	10	1/2	10.7	0.8	6.0	1, 1½, 2, 2½, 3, 3½, 4
IMR7510	IMG7510	-	10	3/4	24.1	1.75	8.0	2, 2½, 3, 3½, 4
IMR2515	IMG2515	-	15	1/4	4.0	0.5	2.5	½, 1, 1½, 2, 2½

Size Options	IMR, IMG & PIM			Connector Options									
Probe Size	Case Dimensions			Connector Type						Connector Position			
∅ (")	A (")	B (")	C (")	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
1/4	1.5	1.2	0.6	-	-	-	-	-	•	-	•	-	-
3/8	1.5	1.2	0.6	-	-	-	-	-	•	-	•	-	-
1/2	1.5	1.2	0.6	-	-	-	-	-	•	-	•	-	-
3/4	1.5	1.2	1.0	-	-	-	-	-	•	-	•	-	-
1	1.5	1.2	1.2	-	-	-	-	-	•	-	•	-	-

Magnetic Probes

MAG



Features

- Normal beam compression wave probe.
- Circular lead metaniobate crystal.
- Medium damped with ceramic wear face.
- Built-in magnet to hold probe to ferrous surfaces.

Frequent Applications

- Thickness Measurements

Transducer Models						
p/n	f	Ø	N	Connector	Connector Position	Dimensions
	(MHz)	(")	(")			
MAG1825	2.25	0.187	0.084	Microdot	Top	Subject to magnet specifications
MAG2525	2.25	0.25	0.151	Microdot	Top	Subject to magnet specifications
MAG3725	2.25	0.375	0.339	Microdot	Top	Subject to magnet specifications
MAG5025	2.25	0.5	0.602	Microdot	Top	Subject to magnet specifications
MAG7525	2.25	0.75	1.355	Microdot	Top	Subject to magnet specifications
MAG1850	5	0.187	0.187	Microdot	Top	Subject to magnet specifications
MAG2550	5	0.25	0.335	Microdot	Top	Subject to magnet specifications
MAG3750	5	0.375	0.753	Microdot	Top	Subject to magnet specifications
MAG5050	5	0.5	1.339	Microdot	Top	Subject to magnet specifications
MAG7550	5	0.75	3.012	Microdot	Top	Subject to magnet specifications



Features

DL

- Dual element, normal beam compression wave probe.
- Small diameter and long reach.
- Lead metaniobate crystal.
- Medium damped.

Frequent Applications

- Long reach probes for inspection through insulation layers.
- Thickness measurements in conjunction with thickness gauge.

Transducer Models								
p/n	f	Ø		Diameter		Length		Connector
	(MHz)	(")	(mm)	(")	(mm)	(")	(mm)	
DL-5	5	3/16	5	0.335	8.5	0.85	21.5	Twin LEMO 00 in boot on fly lead.
DL-5L	5	3/16	5	0.335	8.5	1.15	38.0	
DL-5XL	5	3/16	5	0.335	8.5	6.00	150.0	

Application Specific - Boiler Tube

BTP



Frequent Applications

- Boiler Tubes
- Thickness
- Tube & Pipe
- Critical Welds

Features

- Dual angle beam shear wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Medium damped for medium bandwidth.
- Low profile case for boiler tube inspection.
- Available with profiled shoe.

Transducer Models				
type	f	Θ	a x b	N
p/n	(MHz)	(°)	(mm)	(mm)
BTP5-60	5	60	8 x 5	5
BTP5-70	5	70	8 x 5	5

Size Options				Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
a x b													
8 x 5	27.0	19.0	16.0	•	•	-	-	-	-	-	-	-	•

ElectroMagnetic Acoustic Transducer

EMAT

Features

- EMAT normal beam shear wave EMAT probe.
- Circular, EM coil crystal.
- Damped for bandwidth.
- Suitable for use with normal flaw detectors.
- Requires ferrous oxide layer for magnetostrictive effect.



Frequent Applications

- Boiler Tubes

Transducer Models					
type	f	\emptyset	L	Connector Type	Connector Position
p/n	(MHz)	(mm)	(mm)	BNC (B)	Top (T)
EMAT-Type1	Broadband	28	Adjustable	•	•
EMAT-Type2	Broadband	22	22	•	•
EMAT-Type3	Broadband	22	17	•	•
EMAT-Type4	Broadband	19	23	•	•

Application Specific - Roller Probe

Features

- Pair normal beam compression wave roller probe.
- Circular, lead metaniobate crystal.
- High sensitivity.
- Polymer face.
- Use with Dryscan Flaw Detector.
- Stub axle version available RP25HS-3C (with composite crystal).



Transducer Models		
type	f	∅
p/n	(MHz)	(mm)
RP25HS-1	1.25	10
RP25HS-2	0.5	10
RP25HS-3C	1.25	10

Frequent Applications

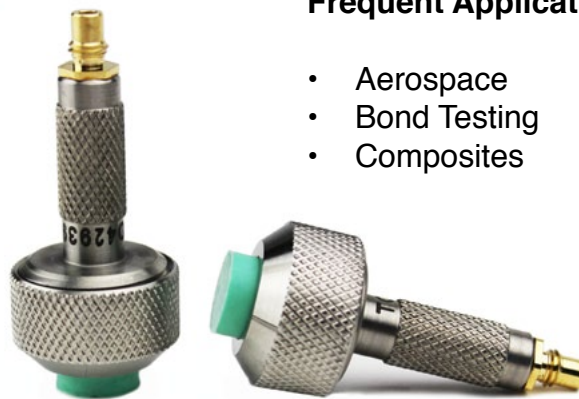
- Aerospace
- Bond Testing
- Composites

Size Options				Connector Options									
Probe Size (mm)	Case Dimensions (mm)			Connector Type						Connector Position			
∅	A	B	C	BNC (B)	Lemo 1 (L)	Lemo 00 (Z)	Microdot (D)	Subvis (S)	UHF (U)	Top (T)	Rear (R)	Side	Cable
10	36.0	113.0	25.0	-	-	•	-	-	-	•	-	-	-

Application Specific - Soft Tip Probe

Features

- Pair of normal beam compression wave soft tip probe.
- Circular, lead metaniobate crystal.
- Low damped for narrow bandwidth.
- Polymer face.
- Use with Dryscan Flaw Detector.



Frequent Applications

- Aerospace
- Bond Testing
- Composites

Size Options				Connector Type		Connector Position
Probe Size (mm)	Case Dimensions (mm)			Lemo 00 (Z)	Subvis (S)	Top (T)
∅	A	B	C			
5	9.8	30.0	-	•	•	•
10	20.0	36.0	-	-	•	•
15	25.0	36.0	-	-	•	•
20	30.0	36.0	-	-	•	•
25	35.0	36.0	-	-	•	•

Transducer Models		
type	f	∅
p/n	(MHz)	(mm)
STP5-1	1.25	5
STP5-2	0.5	5
STP10-1	1.25	10
STP10-2	0.5	10
STP15-1	1.25	15
STP20-1	1.25	20

Application Specific - WheelProbes



Single Element (SEWP)

- The Single Element WheelProbe uses Sonatest Ltd rubber technology for near-dry ultrasonic coupling.
- Using a single element 15 mm immersion probe, the Single Element WheelProbe is designed to operate between 1 MHz and 10 MHz and is available with a low pressure 38 mm tyre (shown) and a higher pressure 25 mm tyre.
- It is complete with an optical positioning encoder and can be connected to any conventional flaw detector, such as the Sonatest MasterScan.
- **Sensor Frequency:** 1 MHz, 2 MHz, 5 MHz & 10 MHz
- **No. of probe elements:** Single
- **Sensor resolution:** n/a
- **Active Area:** 15 mm diameter probe
- **External Dimensions (max)**
L: 175 mm H: 135 mm W: 90 mm
- **Recommended apertures:** n/a
- **Connectors available:** LEMO/BNC
- Masterscan Series compatible



Array WheelProbe (AWP)

- Our famous patented array wheel probe is the result of many years of research and careful design, in consultancy with our RapidScan2 customers in the aerospace market.
- It features a wide (50 mm) conformable rubber tyre which is acoustically matched to water, providing low loss coupling into the test part for high quality results without the need for gel or large quantities of water.
- It is ideally suited to hand scanning of large flat or slightly curved parts, covering large areas quickly and efficiently.
- A central spring loaded roller ensures consistent coupling pressure across the sensor even when scanning narrow parts.
- A high resolution position encoder, the Array Wheel Probe provides high quality, high resolution data.
- **Sensor Frequency:** 2 MHz, 5 MHz & 10 MHz
- **No. of probe elements:** 64
- **Sensor resolution:** 0.8
- **Active Area:** 44.8 mm
- **Recommended apertures:** 8/16 elements
- **External Dimensions (max)**
L: 175 mm H: 155 mm W: 145 mm
- **Connectors available:** Cannon ITT, Hypertronics, Olympus.
- Rapidsan compatible.
- Standard Cable Lengths: 5 m & 10 m

The Original WheelProbe Range



Array WheelProbe (AWP)

- For applications where very larger area coverage is required, the 100 mm Array Wheel Probe is available.
- Due to its larger size (100 mm) it is best suited to flat horizontal components, but will scan curved parts too with a simple adjustment of the array angle.
- Employing a larger, wider tyre made from the same material as our 50 mm Wheel Probe, excellent coupling and data quality is achieved.
- The 100 mm Array uses a 128 element phased array with 0.8 mm resolution and a position encoder providing twice the area coverage as the 50 mm WheelProbe but with the same resolution.
- **Sensor Frequency:** 2 MHz, 5 MHz & 10 MHz
- **No. of probe elements:** 128
- **Sensor resolution:** 0.8 mm
- **Active Area:** 96 mm
- **Recommended apertures:**
8/16/32/64 elements
- **External Dimensions (max)**
L: 200 mm H: 160 mm W: 220 mm
- **Connectors available:** Cannon ITT, Hypertronics, Olympus
- Rapidscan compatible.
- Standard Cable Lengths: 5 m & 10 m.

Radius WheelProbe (RWP)

- Adjusting the inspection angle of the Radius WheelProbe is very quick and can simply be done in situ using the lever and guide on the side of the WheelProbe, tightening the thumb wheel to lock the instrument at the desired angle. The minimum diameter that can be accommodated is 4 inches/10 cm.
- Longitudinal scanning is also easily achieved, as the RWP has a front roller accessory developed specifically, ideal for detection of barely visible impact damage on composite aerospace and marine structures.
- Ideal for delamination, porosity and disbonds.
- **Sensor Frequency:** 2 MHz, 5 MHz & 10 MHz
- **No. of probe elements:** 64
- **Sensor resolution:** 0.8 mm
- **Active Area:** 51.2 mm
- **Recommended apertures:** 8 elements
- **External Dimensions (max)**
- **Without front roller**
L: 154 mm H: 126 mm W: 169 mm
- **With front roller**
L: 178 mm H: 126 mm W: 169 mm
- **Connectors available:** Cannon ITT, Hypertronics, Olympus .
- Rapidscan compatible
- Standard Cable Lengths: 5 m & 10 m.

Application Specific - WheelProbes

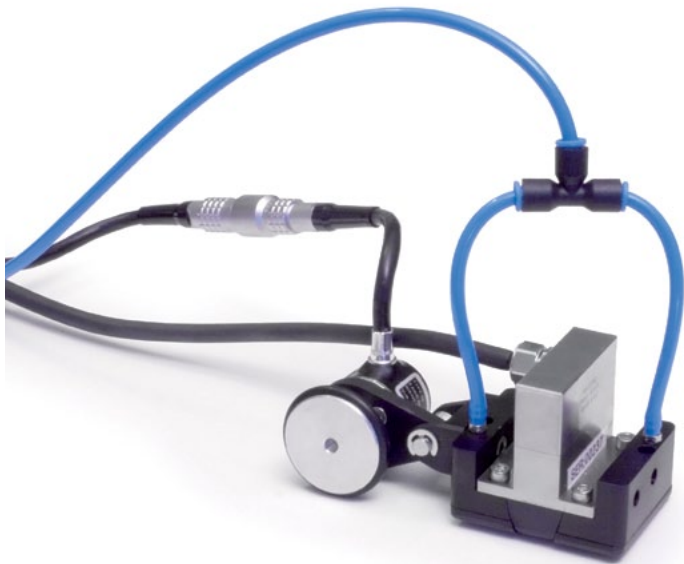


Corrosion WheelProbe (CWP)

- Developed for pipe, pipeline and vessel testing the evolutionary ergonomic design of the Corrosion WheelProbe enables constant and even pressure to be applied in the testing environment, resulting in consistent and repeatable amplitude response.
- Excellent coupling is achievable, even on rough corroded surfaces, thanks to the conformable water filled tyre.
- Encoded 50 mm wide strip scan, B or C Scan, amplitude of Time of Flight (depth) is possible, dependant on host instrument/software.
- An integral encoder enables repeatable and consistent C-Scanning for Defect Evaluation and Sizing.
- **Sensor Frequency:** 2 MHz, 5 MHz & 10 MHz
- **No. of probe elements:** 64
- **Sensor resolution:** 0.8 mm
- **Active Area:** 44.8 mm
- **Recommended apertures:** 8 elements
- **External Dimensions (max)**
- **Without front roller**
L: 154 mm H: 126 mm W: 169 mm
- **With front roller**
L: 178 mm H: 126 mm W: 169 mm
- **Connectors available:** Cannon ITT, Hypertronics, Olympus.
- Veo, Prisma & Rapidscan compatible.
- Standard Cable Lengths: 5 m & 10 m.

Large Low Frequency WheelProbe (WEWP)

- The Large Low Frequency WheelProbe is a development on our existing range of array wheel probes designed for inspection of thick, attenuative composite materials such as Glass Fibre Reinforced Plastic (GFRP).
- Like other probes in the range, it is designed to couple to suitable inspection surfaces with a minimal amount of couplant – a light water misting will be sufficient.
- Inspect GFRP up to 60 mm thick.
- Adjustable for convex and concave surfaces.
- **Sensor Frequency:** 0.5 MHz, 1 MHz.
- **No. of probe elements:** 50
- **Pitch:** 2mm
- **Active Area:** 85 mm
- **Recommended apertures:** 8 elements
- **Weight:** 5.2 kg
- **Connectors available:** Cannon ITT, IPEX
- Rapidscan, Veo, Prisma compatible.
- >30 cm/s scan rate when used with the Sonatest Veo
- Standard Cable Lengths: 5 m & 10 m.



Miniature Bubbler Probe 40 mm Array

- The 40 mm Bubbler Probe has been designed for difficult to access areas, and for curved components.
- It requires a water feed, and this provides exceptionally smooth operation on most metallic and composite surfaces.
- A spring loaded encoder wheel ensures that scan data is registered in the correct location, and the lightweight design minimises operator fatigue.
- **Sensor Frequency:** 2 MHz - 10 MHz
- **No. of probe elements:** 44
- **Sensor resolution:** 0.8 mm
- **Active Area:** 28.8 mm
- **Recommended apertures:** 8 elements
- **Connectors available:** Cannon ITT, Hypertronics, Olympus.



Stringer Inspection Probe

- Developed in consultation with aerospace manufacturers for scanning long stringer components where access to the stringer radius is critical.
- This sensor can be supplied with a standard 50 mm array, a larger 90 mm array.
- The sensor can be supplied with one or two high resolution spring-loaded encoders to ensure that 100% coverage at each end of the part to inspect.
- Using a solid hard-wearing rubber shoe, and moulded plastic hand grip, this probe is also suited to scanning curved parts.
- **Sensor Frequency:** 2 MHz - 10 MHz
- **No. of probe elements:** 64 or 112
- **Sensor resolution:** 0.8 mm
- **Active Area:** 44.8 mm or 83.2 mm
- **Recommended aperture:** 8 elements
- **Connectors available:** Cannon ITT, Hypertronics, Olympus

For further information on any of the products shown in this catalogue or from the full Sonatest range of products please contact us:

Sonatest Ltd (UK) email: sales@sonatest.com tel: +44 (0)1908 316345
Sonatest Inc (USA) email: sales@sonatestinc.com tel: +1 (210) 697 0335

www.sonatest.com

Phased Array Transducers

DAAH Detachable Active Array Head

Sonatest manufacture a wide range of Array and Mono-Element probes suitable for use on the **veo** and Prisma, as well as other phased array flaw detectors.

The DAAH (Detachable Active Array Head) range provides a unique phased array probe solution using standard cables and a range of detachable probe heads. This concept yields advantages in cost and gives the end user more flexibility in the field during the inspection process.

All DAAH probes require an external adapter cable.

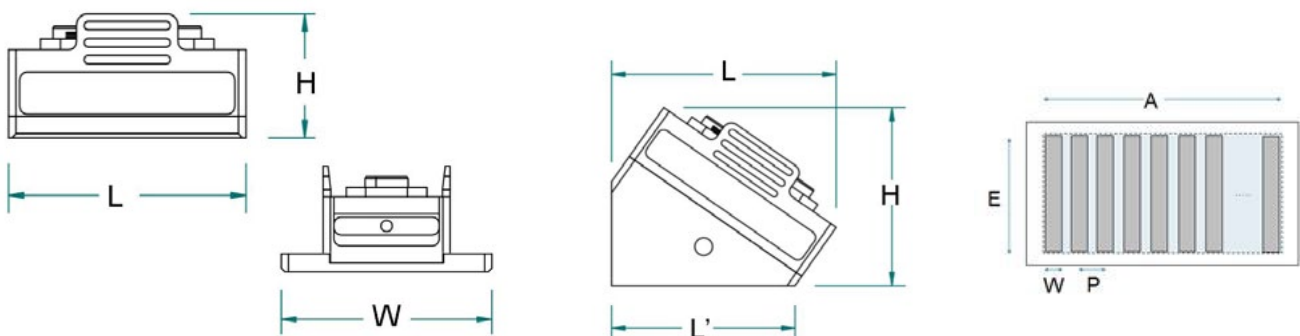
Features

- Phased array beam wave contact probe
- Rectangular, lead zirconate titanate crystal
- Damped for bandwidth
- Epoxy face

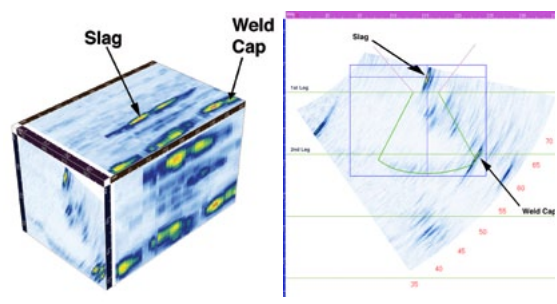
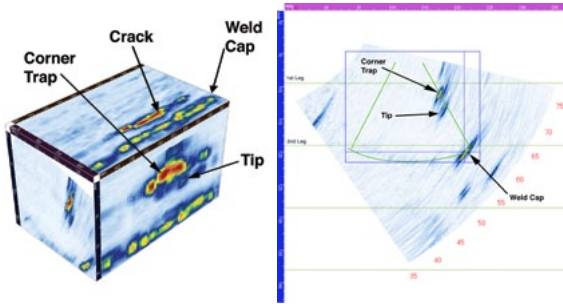
Frequent Applications

- Aerospace
- Composites
- Machined parts
- Critical Welds

Transducer Models										
type	Frequency	Wedge Cut Angle	No of Elements	Element Pitch	Aperture Length	Aperture Elevation	External Height	External Width	Overall Length	Footprint Length
p/n	(MHz)	(°)		P(mm)	A (mm)	E (mm)	H (mm)	W (mm)	L (mm)	L' (mm)
T1-PE-2.2M20E1.2P	2.25	external	20	1.2	24.0	12.0	14.7	29.3	32.0	-
T1-PE-2.2M19E1.2P-17WoD	2.25	17	19	1.2	22.8	12.0	22.6	17.6	33.8	30.0
T1-PE-2.2M14E1.2P-35WoD	2.25	35	14	1.2	16.8	12.0	27.5	17.6	34.1	28.0
T1-PE-5.0M32E0.8P	5	external	32	0.8	25.6	12.0	14.7	29.3	32.0	-
T1-PE-5.0M26E0.8P-17WoD	5	17	26	0.8	20.8	12.0	22.6	17.6	33.8	30.0
T1-PE-5.0M22E0.8P-35WoD	5	35	22	0.8	17.6	12.0	27.5	17.6	34.1	28.0
T1-PE-5.0M64E0.8P	5	external	64	0.8	51.2	12.0	20.6	29.2	60.0	-
T1-PE-7.5M44E0.6P	7.5	external	44	0.6	26.4	12.0	14.7	29.3	32.0	-
T1-PE-7.5M40E0.6P-17WoD	7.5	35	30	0.6	18.0	12.0	27.5	17.6	34.1	28.0
T1-PE-7.5M30E0.6P-35WoD	7.5	17	40	0.6	24.0	12.0	22.6	17.6	33.8	30.0
T5-PE-5.0M64E0.8P	5	external	64	0.8	51.2	12.0	20.6	29.2	60.0	-



Probes specified as external wedge must be used with an external wedge or delay line, the face is not wear-resistant. Integral Wedges – 17° longitudinal wave. 35° shear wave in steel.



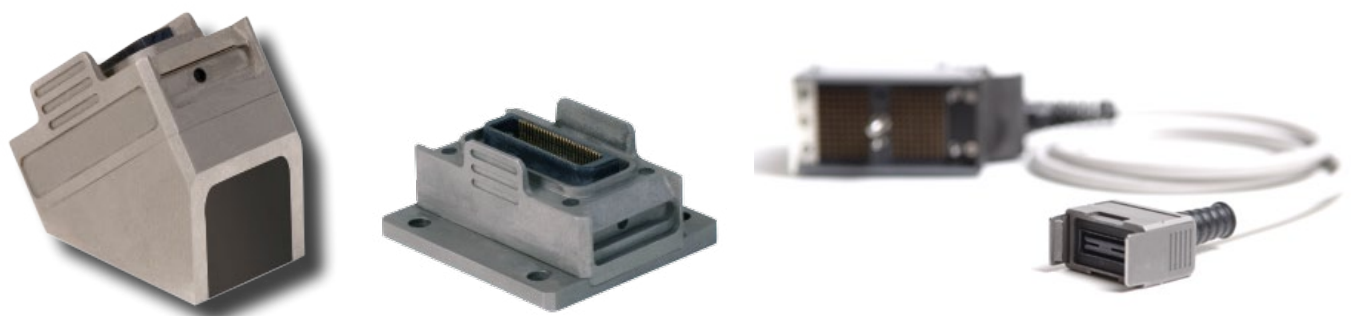
Wedges

	Cut Angle	Features	Front Height	Back Height	Length	Width	Radius
p/n	(°)		(mm)	(mm)	(mm)	(mm)	(")
T1-12.7T0D-REXO	0	F	12.7	-	42	30	Flat
T1-25.4T0D-REXO	0	F	25.4	-	52	30	Flat
T1-17W0D-REXO	17	A	14.7	4.5	40.2	29.2	Flat
T1-35W0D-REXO	35	A	27.2	6.1	48.6	31.75	Flat
T5-12.7T0D-REXO	0	F	12.7	-	80	30	-
T5-25.4T0D-REXO	0	FI	25.4	-	80	30	-
T5-35W0D-REXO	35	A	59	16	109	32.2	-

Features: F - Flat Delay Line, A- Angled, I – Irrigated, R - Axial Radius

DAAH Cable Adaptors

Part Number	Probe Type	Number of Sockets	Cable Length	Connector Type
			(m)	
ASM-9038-HY200	T1	Single	2	Hypertronics
ASM-9038-IX200	T1	Single	2	IPEX
ASM-9038-IX800	T1	Single	8	IPEX
ASM-9039-HY200	T1	Dual	2	Hypertronics
ASM-9039-IX200	T1	Dual	2	IPEX
ASM-9039-IX800	T1	Dual	8	IPEX
ASM-9048-HY200	T5	Single	2	Hypertronics
ASM-9048-IX200	T5	Single	2	IPEX
ASM-9088-IX500	T5	Single	5	IPEX
ASM-9049-IX1200	T5/T1 Adaptor	Single	2	T5/T1 Adaptor



Phased Array Transducers

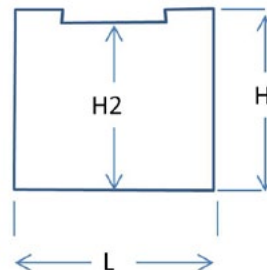
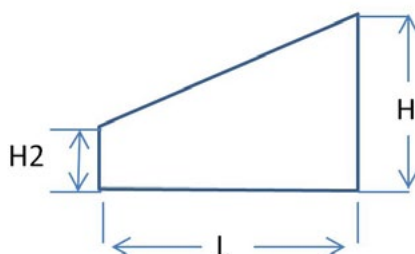
X-Series

The X-Series of transducers now offer the operator a broader choice in range and frequencies; together with the assurance of industry standard configurations. These X-Series phased array probes have an integral 2.5 m cable and an IPEX connector. Compatible with the Sonatest **veo** and other leading phased array testing equipment. Most probes are also available with a 5 m cable, part numbers ending in IX500.

Transducer Models									
Part Number	Frequency	Number Elements	Element Pitch	Aperture Length	Aperture Elevation	External Size	External Size	External Size	Wedge Series
	F		P	L	E	L	W	H	
	(MHz)		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	
X1 Series									
X1PE5.0M10E0.6PIX250	5	10	0.6	6	5	13.0	10.0	23.0	X1-SB54
X1PE10M10E0.6PIX250	10	10	0.6	6	5	13.0	10.0	23.0	
X1-Sub									
X1PE10M16E0.3PIX250	10	16	0.3	5	5	8.0	8.0	23.0	X1-SB55
X2 Series									
X2PE5.0M16E0.6PIX250	5	16	0.6	10	10	16.0	23.0	20.0	X2-SB56
X2PE5.0M16E0.6PIX500	5	16	0.6	10	10	16.0	23.0	20.0	
X2PE7.5M16E0.6PIX250	7.5	16	0.6	10	10	16.0	23.0	20.0	
X2PE7.5M16E0.6PIX500	7.5	16	0.6	10	10	16.0	23.0	20.0	
X2PE10M16E0.6PIX250	10	16	0.6	10	10	16.0	23.0	20.0	
X2PE10M16E0.6PIX500	10	16	0.6	10	10	16.0	23.0	20.0	
X2PE10M32E0.3PIX250	10	32	0.3	10	10	16.0	23.0	20.0	
X3 Series									
X3PE2.2M48E0.8PIX250	2.25	48	0.8	39	8	45.0	23.0	20.0	X3-SB57
X3PE2.2M48E0.8PIX500	2.25	48	0.8	39	8	45.0	23.0	20.0	
X3PE3.5M64E0.6PIX250	3.5	64	0.6	39	8	45.0	23.0	20.0	
X3PE3.5M64E0.6PIX500	3.5	64	0.6	39	8	45.0	23.0	20.0	
X3PE5.0M64E0.6PIX250	5	64	0.6	39	8	45.0	23.0	20.0	
X3PE5.0M64E0.6PIX500	5	64	0.6	39	8	45.0	23.0	20.0	
X3PE10M64E0.6PIX250	10	64	0.6	39	8	45.0	23.0	20.0	
X3PE10M64E0.6PIX500	10	64	0.6	39	8	45.0	23.0	20.0	
X4 Series									
X4PE2M8E1.0P35WIX250	2	8	1.0	8	9	27.0	16.5	22.0	n/a
X4PE4M16E0.5P35WIX250	4	16	0.5	8	9	27.0	16.5	22.0	
X5 Series									
X5PE2.2M16E1.0PIX250	2.25	16	1.0	16	16	34.0	20.0	18.0	X5-SB58
X5PE2.2M16E1.0PIX500	2.25	16	1.0	16	16	34.0	20.0	18.0	
X5PE5.0M16E1.0PIX250	5	16	1.0	16	16	34.0	20.0	18.0	
X5PE5.0M16E1.0PIX500	5	16	1.0	16	16	34.0	20.0	18.0	

Probes: • IX250 2.5 m cable length, IPEX connector

• IX500 5 m cable length, IPEX connector



Features

- Phased array beam wave contact probe.
- Rectangular, lead zirconate titanate crystal.
- Damped for bandwidth.
- Axial and Circumferential ID or OD profiling available.

Frequent Applications

- Aerospace
- Composites
- Machined Parts
- Critical Welds

Wedge Models							
Part Number	Cut Angle	Beam Angle	Length	Width	Front Height	Back/Path Height	Features
	(°)	(°)	L (mm)	W (mm)	H (mm)	H2 (mm)	Flat
X1 Series							
X1-SB54-N0L(10)	0.0	0	12.0	23.0	11.0	10.0	F
X1-SB54-N0L(20)	0.0	0	12.0	23.0	21.0	20.0	F
X1-SB54-N55S	36.0	55	36.2	16.0	2.00		A
X1-SB54-N60L	20.0	60	29.1	16.0	21.2		A
X1-SB55-N0L(5)	0.0	0	15.0	15.0	15.0	5.0	F
X1-SB55-N0L(20)	0.0	0	15.0	15.0	30.0	20.0	F
X1-SB55-N45S	31.0	45	21.1	12.0	13.3	6.6	A
X1-SB55-N55S	36.0	55	26.4	16.0	13.4		A
X1-SB55-N60L	20.0	60	33.0	16.0	18.0		A
X1-SB55-N60S	39.0	60	21.3	12	13.3	5.1	A
X2 Series							
X2-SB56-N0L	0.0	0	23.0	25.0	25.0	25.0	F
X2-SB56-N45S	31.0	45	26.5	25.0	15.3		A
X2-SB56-N60S	39.1	60	26.5	25.0	17.5		A
X2-SB56-N60L	20.0	60	26.3	25.0	25.0		A
X2-SB56-N0L-IHC	0.0	0	23.0	25.0	25.0	25.0	FI
X2-SB56-N45S-IHC	31.0	45	26.5	25.0	15.3		AI
X2-SB56-N60S-IHC	39.1	60	26.5	25.0	17.5		AI
X2-SB56-N60L-IHC	20.0	60	26.3	25.0	25.0		AI
X3 Series							
X3-SB57-N0L	0.0	0	45.0	25.0	25.0	25.0	F
X3-SB57-N45S	31.0	45	66.0	25.0	41.4		A
X3-SB57-N45L	16.5	45	65.0	25.0	34.6		A
X3-SB57-N55S	36.0	55	65.4	25.0	38.7		A
X3-SB57-N60S	39.1	60	65.6	25.0	36.5		A
X3-SB57-N60L	20.0	60	66.3	25.0	41.2		A
X3-SB57-N0L-IHC	0.0	0	45.0	38.0	25.0	25.0	FI
X3-SB57-N45S-IHC	31.0	45	66.0	38.0	41.4		AI
X3-SB57-N45L-IHC	16.5	45	60.4	38.0	34.6		AI
X3-SB57-N55S-IHC	36.0	55	65.4	38.0	38.7		AI
X3-SB57-N60S-IHC	39.1	60	65.6	38.0	36.5		AI
X3-SB57-N60L-IHC	20.0	60	66.3	38.0	41.4		AI
X5 Series							
X5-SB58-N0L	0.0	0	38.0	38.0	40.0	40.0	F
X5-SB58-N60S	39.1	60	45.0	38.0	30.0		A
X5-SB58-N60L	20.0	60	45.0	38.0	30.0		A
X5-SB58-N0L-IHC	0.0	0	38.0	52.0	40.0	40.0	FI
X5-SB58-N60S-IHC	39.1	60	45.0	52.0	30.0		AI
X5-SB58-N60L-IHC	20.0	60	45.0	52.0	30.0		AI

Beam Angle specified in Steel, Suffix L – Longitudinal Wave Mode S- Shear Wave mode .

Features: F - Flat Delay Line, A- Angled, I – Irrigated with wear pins

55 SW, SNW Wedges (size 5/8 × 5/8) can also be used with the X5 series of probes.

Cables & Adapters

Cable Type (*Waterproof)		Part Number	Order Code
Lemo 1 to Subvis	Single	PC-LS	152056
	Twin	TPC-LS	152061
Lemo 1 to Microdot	Single	PC-LD	152057
	Twin	TPC-LD	152062
Lemo 1 to Lemo 00	Single	PC-LZ	152076
	Twin	TPC-LZ	152088
Lemo 1 to Lemo 1	Single	PC-LL	152074
	Twin	N/A	152077
Lemo 1 to UHF*	Single	PC-LU	152059
	Twin	N/A	N/A
Lemo1 to BNC	Single	PC-BL	152055
	Twin	N/A	152075
BNC to Subvis	Single	PC-BS	152022
	Twin	TPC-BS	152023
BNC to Microdot	Single	PC-BD	152052
	Twin	TPC-BD	152060
BNC to Lemo 00	Single	PC-BZ	152086
	Twin	TPC-BZ	152087
BNC to BNC	Single	PC-BB	152053
	Twin	N/A	N/A
BNC to UHF*	Single	PC-BU	152058
	Twin	N/A	N/A
BNC to Lemo 1	Single	PC-BL	152055
	Twin	N/A	N/A
Lemo 00 to Lemo 00	Single	PC-ZZ	152122
	Twin	TPC-ZZ	152089
Fischer to Lemo 00	Single	PC-FZ	152124
	Twin	TPC-FZ	152129
Fischer to Lemo 1	Single	PC-FL	152126
	Twin	N/A	N/A
Fischer to Microdot	Single	PC-FD	152128
	Twin	TPC-FD	152131
Lemo 00 to Microdot	Single	PC-ZD	152102
	Twin	TPC-ZD#	152115 #
Lemo 00 to Subvis	Single	PC-ZS	152123
	Twin	TPC-ZS	152108
Fischer to Subvis	Single	PC-FS	152125
	Twin	TPC-FS	152130
Fischer to BNC	Single	PC-FB	152127
	Twin	N/A	N/A



Lemo-1



Lemo-00



Subvis



Microdot



BNC



UHF



Fischer

Adapters (F) Female (M) Male	Order Code
UHF (M) to BNC (F)	136166
UHF (F) to UHF (F)	136167
BNC (M) to BNC (F)	136168
BNC (F) to LEMO1 (M)	136169
BNC (M) to LEMO1 (F)	152018
BNC (M) to UHF(F)	136178

All cables are 2 metres/ 6 feet in length, except where marked #, these are 1 m / 3 ft in length.

Specific cable lengths can be manufactured, to order, please contact us for further information.

SONAGEL

Sonatest present a full range of stable gels specifically designed for ultrasonic inspection. Sonagel's thixotropic properties provide excellent wetting and acoustic transmission; is non-corrosive to metals, non-toxic and safe for the user and the environment.

SONAGEL W

A stable clear yellow gel specifically designed for the ultrasonic inspection of all types of surfaces and is especially suited to solving the problems of rough, pitted and uneven surfaces.

- Sonagel W is non-flammable and operates in the temperature range of -10°C to 60°C .
- Contains a special tracer dye to enable areas to be checked for coverage and is easily removed with water, alcohol or similar solvent.

SONAGEL WT

- Is similar to Sonagel W but is a stable clear thixotropic gel specially designed to be odourless and colourless for specific applications

SONAGEL O

- Sonagel O is a stable, semi-transparent orange gel and is offered as a replacement for mineral oils and greases. It is hydrocarbon-based and retains its gel state without causing corrosion or drying on the test surface. Sonagel O has a flash point of 175°C (PM) and operates in the temperature range of -10°C to 160°C .

SONAGEL HT1

- HT1 is a thick translucent paste designed for ultrasonic inspection up to 300°C . It is non-toxic and safe to the environment, does not generate any toxic fumes at elevated temperatures and is free from volatile organic compounds.
- This product is also available in a number of different liquid viscosities.

SONAGEL OP

- Sonagel OP is a hydrocarbon based, low viscosity product specifically created for pump systems where water-based products are not suitable due to corrosion.

SONAGEL LCW

- Sonagel LCW is a liquid corrosion inhibitor concentrate for water-based systems which improves wetting in a large dip tank or spray system.

All of the above products are available in bulk plastic containers of 25 litres down to 0.125 litre bottles.

All products conform to relevant military, automotive and aerospace specifications as well as meeting the sulphur and halogen requirements of nuclear and industrial specifications.



Calibration Blocks

V1/5 (A2) Calibration Block (V1)

For calibrating ultrasonic flaw detection equipment in both laboratory and on-site conditions. Used for calibration of shear and longitudinal transducers, determination of shear wave emission point, refracted angle.

Includes a 100 mm radius, 1.5 mm and 50.0 mm holes, engraved reference mark scales, and slots at the zero point which provide calibrating signals at intervals of 100 mm range. Used for calibrating in accordance with British Standard BS 2704 Block A2 Mod. 1, EN 12223, German Standard DIN 54-120, Australian Standard AS 2803, and ISO 2400. Also meets the requirements of the Dassault Aviation Falcon 10 Mandatory Service Bulletin #294 dated March 20, 2002.



IIW TYPE 2 BLOCK

A modified version of the original IIW-Type 1 design. Includes a 2.0" radius x .250" deep cut-out superposed on the 4.0" radius for distance calibration. Also includes numbers 3, 5 and 8 through holes (3/64", 5/64" AND 8/64" diameter) and distance calibration marks to the 2.0" hole. In accordance with International Institute of Welding, ASTM E164 and U.S. Air Force NDI Manual T.O. 33B-1-1 specifications.

- **Dimensions: 12.0" x 4.0" x 1.0"** • **4340 Steel, Nickel-plated**
- **Fitted wooden storage case or Cordura shoulder case optional**



V2 (A4) Calibration Block (V2)

12.5 mm thick small, carbon steel, calibration block for on-site checking of miniature shear wave probe index, time base, beam angle and gain. Includes a 25 mm and 50 mm radius, 1.5 mm hole (or 5mm), engraved reference mark scales from 35° to 75°. In accordance with British Standard BS 2704 block A4, Fig. 4, and AS 2083.

- **Dimensions: 75mm x 43mm x 12.5mm**
- Also available in 20 mm and 25 mm thicknesses for calibration of non-miniature probes.
- Fitted wooden storage case optional



Velocity Block (CBV)

Equivalent to a 1US thickness of a known velocity in steel. The block is mounted in perspex. Used to check the velocity of other materials with thickness meters.



Universal CBU Calibration Block

For the calibration of small shear wave and longitudinal transducers, determination of shear wave emission point, refracted angle and measurement of sensitivity and depth resolution. 50 mm radius.

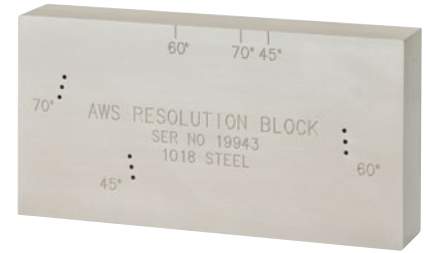
SteelPipe Wedge (PW)

Made from 50 mm diameter pipe with thickness steps of 10, 8, 6, 4, and 2 mm. The pipe wedge simulates steam boiler tubes in power stations and is used to calibrate flaw detectors for thin tube inspections.

AWS Resolution Block

Also called an RC block, the AWS Resolution Reference Block is used for checking resolution capabilities of angle beam transducers. Contains three sets of .0625" diameter through-holes for 45°, 60° and 70°. In accordance with AWS Welding Highway and Railway Bridges specification D2.0, and Structural Welding Code ANSI/AWS D1.1. Made from 1018 Steel, Nickel-plated.

- **Dimensions: 6.000" x 3.000" x 1.000" (152.4 mm x 76.2 mm x 25.4 mm)**
- AWS does not specify a separate metric version of the AWS Resolution block. The metric block in AWS shows only the metric equivalents to the standard design. Therefore, this one block can be used for both inch and metric requirements.
- Fitted wooden storage case optional



DSC Test Block (Imperial & Metric version available)

AWS-type block used for shear wave distance and sensitivity calibration. Contains a 1.0" radius opposite a 3.0" radius. The 3.0" radius includes a .375" deep x .032" wide radiused slot. Also contains a 0° reference point for checking exit point on wedge, and a .125" diameter through hole and corresponding markings at 45°, 60°, and 70° for measuring actual refracted angle. In accordance with ASTM E164 and AWS 6.16.1B.

Special DSC blocks with radiussed scanning surfaces for NPS sizes also offered.

- **Dimensions: 1" thick**
- **Fitted wooden storage case optional**



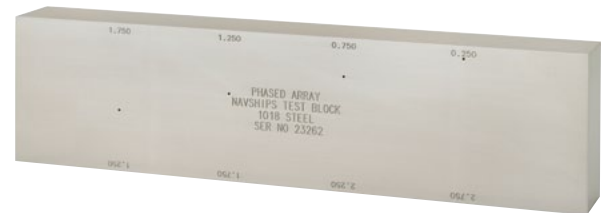
Navships Block

This special Phased Array version of the popular NAVSHIPS block solves the problem of too many holes interfering with one another. The block contains four holes at 3/64" diameter drilled through the 1.250" width.

The holes are located at .250, .750, 1.250, 1.750, 2.250, and 2.750".

Dimensions: 1.250" wide x 3.000" tall x 12.00" long

Alloy: 1018 Steel, nickel-plated



Calibration Step Wedge

(Imperial (CBI) & Metric (CBM) available)

Series of steel discs set into a perspex block for calibration and linearity checking of thickness gauges and flaw detectors.

Wedge thicknesses are:

Inches: 0.05, 0.1, 0.2, 0.3, 0.4, 0.6 inches

mm: 1.5, 2.5, 5.0, 10.0, 15.0, 20.0 mm

Steel Step Wedge (VW)

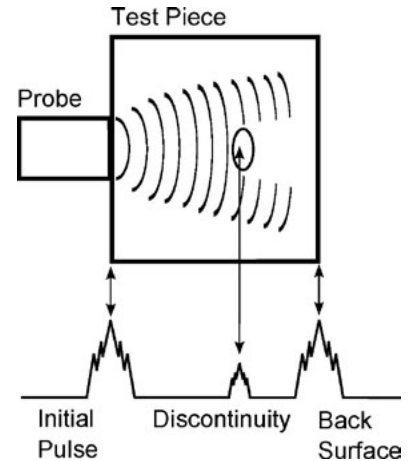
Used for checking the sensitivity of twin transducers on thin sections when using flaw detectors, thickness and linearity calibration.

- 1 mm to 8 mm in 1 mm steps.
- Each "step" is 20 mm x 20 mm. (0.75" x 0.75")
- Specification ASTM E797.
- Fitted wooden storage case optional.



Fundamentals of Ultrasonic NDT

In ultrasonic non-destructive testing (NDT) short pulses of sound at ultrasonic frequencies are introduced into the test item by a transducer. Any changes in the material property of the test material or boundaries will produce reflections to varying degrees. If these reflections eventually return to the transducer, then the time delay between their introduction and return may indicate how far into the test item they originated from. This time delay or path length may permit the identification of the position of the reflector. Similarly the amplitude of the echo may indicate the size or nature of the reflector. In cases when the reflector introduces a significant change in the material acoustic impedance (which is the product of material density and sound speed in the material) the reflection is strong, for instance at metal-air boundary.



The generation of ultrasonic pulses for NDT generally relies on the piezoelectric effect, whereby an electrical voltage pulse of between 50 and 500 V is applied across a piezo-ceramic crystal. This causes the crystal to deform. The motion of the crystal is transmitted to the test item via a coupling layer, thus introducing the ultrasound to the test item. The detection of echoes works in the same fashion but in reverse. The attenuated echo causes the crystal to vibrate disturbing the internal charge distribution in the crystal and thus creating a very small voltage which is measured. Thus the electronics in ultrasonic inspection equipment must be able to generate a precise, short high voltage pulse as well as amplify and accurately measure a short, very low voltage pulse.

Transducer Characteristics

Ultrasonic transducers for non-destructive testing come in a wide variety of configurations in order to facilitate numerous inspections possibilities. Despite this, there are a small number of physical characteristics which are commonly used to describe the performance of ultrasonic transducers and therefore identify them in inspection procedures and manufacturers' documentation.

Frequency

Transducers are classified by the nominal frequency of the ultrasound that they emit or are most sensitive to. This is the number of cycles per second of the pressure fluctuations in the material. Because ultrasound is high frequency it is usually measured in megahertz (MHz), which are million multiples of a hertz. So 1 MHz is 1 million cycles per second. Occasionally kilohertz (kHz) are used where the frequencies are thousand multiples of a hertz. It is the high frequency range that classifies this branch of acoustics as ultrasonics. The frequency is important because in conjunction with the speed of sound in the material it determines the wavelength of the sound, which is one of the factors that determine whether a reflection or echo is generated by a target object or defect.

Element Size

Transducers are also classified according to the size of their active sensor elements. The size of the element in conjunction with the frequency determines the shape of the beam emitted by the element. The size of the element determines the size of the transducer enclosure and so also affects how the transducer couples to the test item.

Element Type

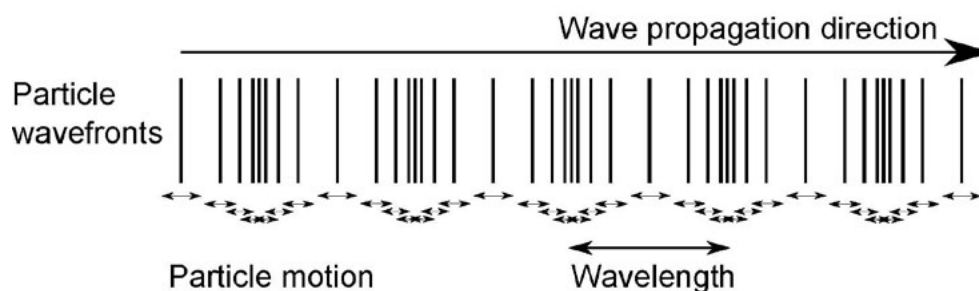
Transducer elements are commonly made from the piezo-ceramic materials lead zirconate titanate (PZT) or lead metaniobate (PMN). They can be single crystals, composite crystals or phased arrays. Single crystals are a block of piezo-ceramic with one electrode on either side. Composite crystals comprise an array of vertical fingers of piezo-ceramic embedded in a

resin matrix. The fingers are electrically connected by two electrodes in the same way as single crystals. The resin matrix permits both the acoustic impedance and mechanical resonances of the crystal to be manipulated, typically resulting higher bandwidth and sensitivity. In phased arrays the individual elements are similarly embedded in a resin matrix, but are electronically independent, i.e. individual electrodes for each element.

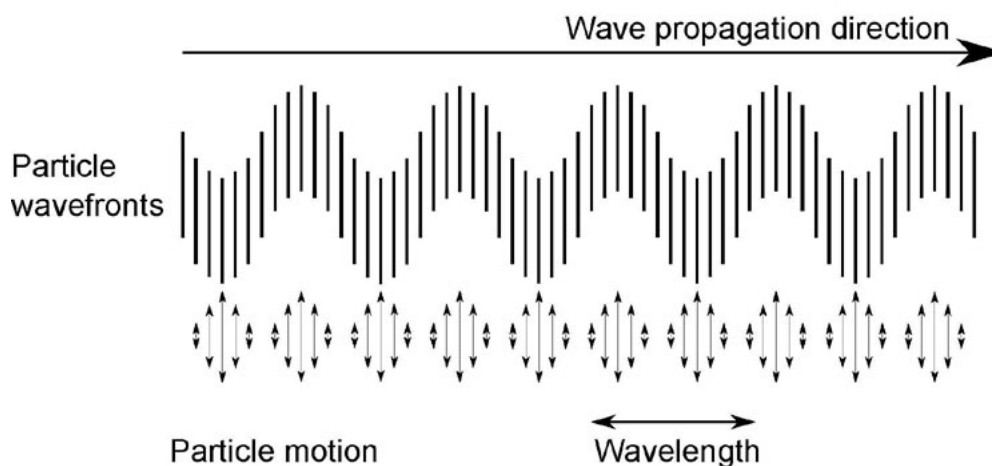
Bandwidth and Damping

An ultrasonic transducer emits a burst or pulse of ultrasonic energy which will contain a discrete number of pressure cycles at the transducer's nominal frequency. In practice this pulse contains cycles that start with small amplitude grow to large amplitude and reduce to small amplitude at the end of the pulse. This in fact means that the pulse contains a spread of frequencies of which the transducer's nominal frequency is the most prevalent. The shorter and sharper the pulse, the fewer cycles and the broader the spread of frequencies involved. The longer the pulse, the more cycles and the narrower the spread of frequencies involved. The breadth of the frequency content is measured by the quantity called the bandwidth. The bandwidth has a significant impact on the ability of a transducer to resolve defects and penetrate into the material. The bandwidth is controlled by the application of acoustic damping to the sensor crystal. An undamped crystal will oscillate for a longer time generating a pulse with many cycles thus containing much acoustic energy and having a narrow bandwidth, good penetration but poor resolution. A highly damped crystal will oscillate for a short time generating a pulse with few cycles thus containing less acoustic energy and having a broad bandwidth, poor penetration but good resolution.

Longitudinal Wave Propagation



Transverse Wave Propagation



Wave Type

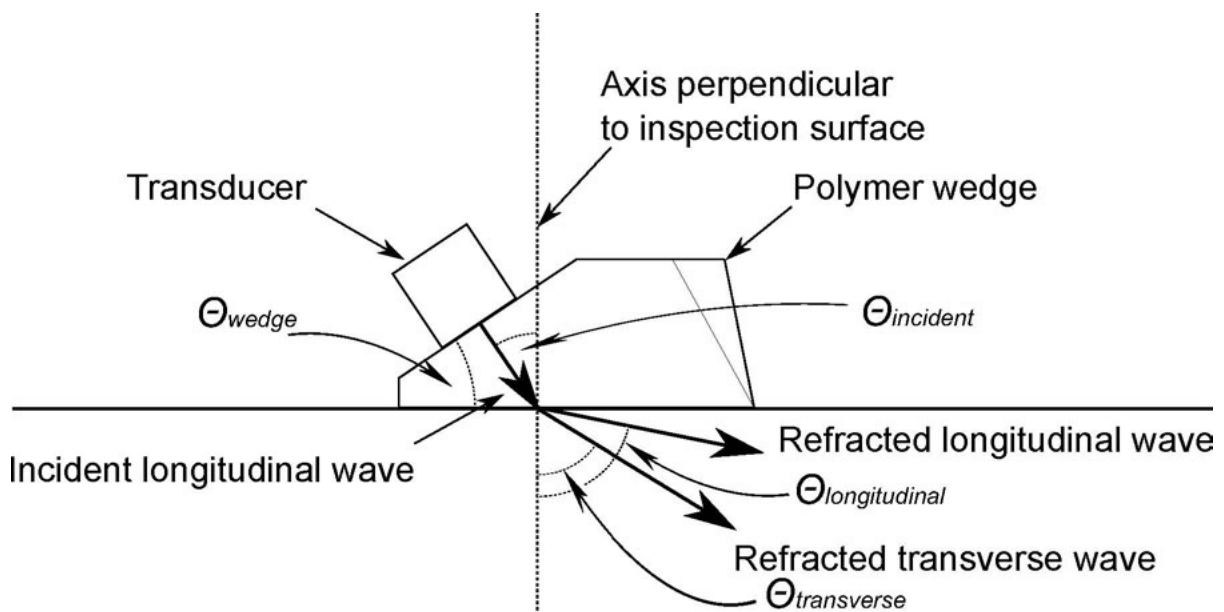
There are several different types, or modes, of ultrasonic wave propagation, not all are possible in all materials. Compression waves, also known as longitudinal waves, oscillate along the direction of propagation. Shear waves, also known as transverse waves, oscillate perpendicular to the direction of propagation. Less common are various types of surface and body waves. Solid materials support both compression and shear waves and the wave speed, or sound velocity, for the compression wave is always greater or faster than the shear wave. Liquids do not support shear waves and so immersion tests use compression waves. A wave of one type may generate a wave of another type when it passes from one material into another. This process is called mode conversion. Some transducer types rely on this phenomenon in order to generate the required ultrasonic sound beam. Some materials, e.g. austenitic steels, propagate shear waves very poorly and practical inspection requires compression waves.

Beam Angle

In order to detect certain defects it is sometimes necessary to produce beams of ultrasound at different angles. The beam angle is always measured with respect to an axis perpendicular, or normal, to the inspection surface. Therefore a transducer with a beam looking directly into the material is referred to as 0° or normal beam probe. A 90° probe has a beam looking along the inspection surface and may well propagate a surface wave. The beam angles that are possible are determined by Snell's Law which relates the beam in the transducer to the relative sound velocities in the transducer and the test material. Snell's Law is given by the formula

$$\frac{\sin\Theta_{incident}}{c_{incident}} = \frac{\sin\Theta_{transverse}}{c_{transverse}} = \frac{\sin\Theta_{longitudinal}}{c_{longitudinal}}$$

The incident longitudinal wave in the wedge is mode converted into two refracted beams in the material, one longitudinal and one transverse. The angles Θ and sound speeds c are the corresponding beam angle and sound speeds for a given wave type in the two materials. Snell's Law is used to calculate the necessary wedge (or cut) angle in order to achieve a specified beam angle for a specified combination of wedge material and test material. If either the wedge material or the test material is changed a different beam angle will result. As the speed of sound for compression waves is always greater than for shear waves in the same material. Above a certain angle the longitudinal beam will be reflected back into the wedge.



Coupling and Lens Configuration

In a similar way to which the beam angle is determined, it is possible to influence the geometry of the beam of ultrasound by the application of lenses or delay-lines between the crystal and the test material. This may change the focal length of a flat faced transducer or may focus the beam to line or spot in the case of probes to which curved faces are introduced. The selection of lens or interface layer may also provide benefits for coupling to the test item by providing a compliant face that fills gaps or by providing improved matching of the acoustic impedances. A delay-line may also help to minimise wear to the transducer face thus prolonging the operational life of the transducer. Delay-lines are also useful in the protection of transducers when testing items at high temperatures.

The difference in the acoustic impedances of two adjoining materials determines the proportion of the incident sound is re-

flected at the interface and what proportion is transmitted. The acoustic impedance, Z , is the product of the material's density, ρ , and its velocity, c . Knowledge of the density and speed of sound for each wave type allows the reflection and transmission coefficients, R and T , to be calculated. Hence a near-perfect reflection occurs at the surface of a metal calibration block on account of the large differences in the densities and speeds of sound in steel and air and also the acoustic impedances. (See the table of acoustic properties of materials.)

$$Z = \rho c \quad R = \frac{Z_2 - Z_1}{Z_2 + Z_1} \quad T = \frac{2Z_2}{Z_2 + Z_1}$$

Transducer Size, Frequency and Beam Profile

On leaving a transducer ultrasound forms a sound field, or spatial distribution, described by the beam profile, which is determined by the size, geometry and frequency of the transducer. Close to the transducer, in a region called the Near Field or Fresnel Zone, the sound field varies in a complicated manner and so the detection of defects within this region is more difficult. A flat-faced transducer will have a natural focal zone that occurs at the end of the Near Field and beyond which the sound field becomes more easily predictable in a region called the Far Field or Fraunhofer Zone. In this zone the detection of defects is more straightforward, however, as one moves further from the focal point the beam diverges and gets weaker. The combination of frequency and aperture size determines the rate, or angle of beam divergence. Large aperture, low frequency probes have wide beams, but smaller angles of divergence, whereas, small aperture, high frequency probes have narrow beams with larger angles of divergence. The combination of probe aperture and frequency therefore affects the ability of a probe to detect defects.

N = Nearfield length (mm)

c = Speed of sound (m/s)

f = Frequency (MHz)

D = Crystal diameter (mm)

γ_6 = Divergence angle for -6 dB beam edge (°)

$$\sin \gamma_6 = \frac{0.51c}{Df} \quad N = \frac{D^2 f}{4c}$$

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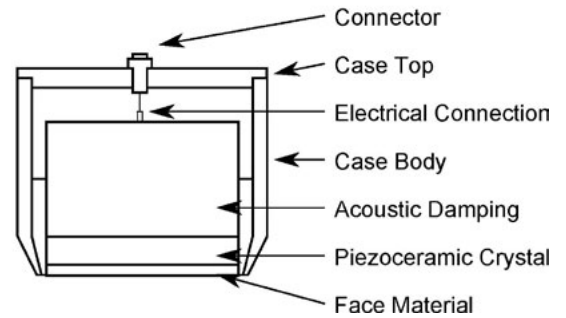
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Transducer Types

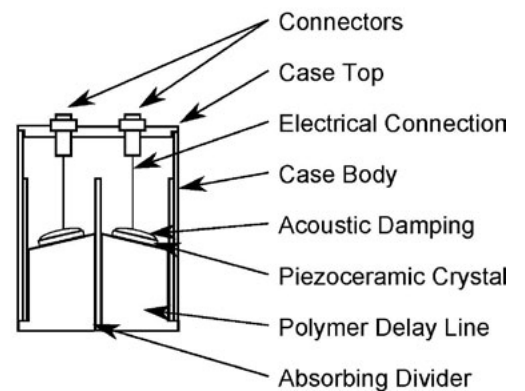
Single Element Transducers

Single element transducers have one active element which is used for both the transmission and reception of ultrasound. Single element transducers can generate compression or shear waves, normal or angled beams, be contact or immersion and can have variety of coupling/lens configurations. These transducers can be used on thickness gauges, flaw detectors and phased array instruments.



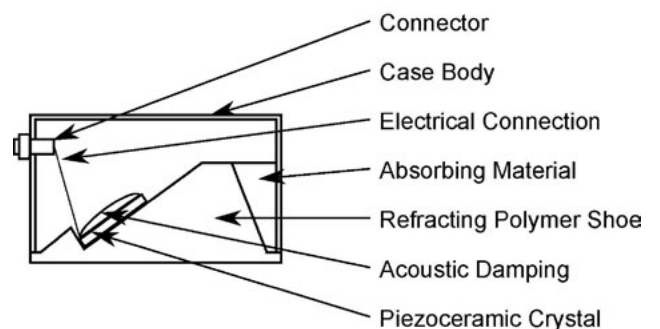
Dual Element Transducers

Dual element transducers have two active elements, one is used for the transmission and one for the reception of ultrasound. Dual element transducers typically are contact transducers and use an integral delay-line or shoe, they can generate compression or shear waves, normal or angled beams. These transducers can be used on thickness gauges, flaw detectors and phased array instruments.



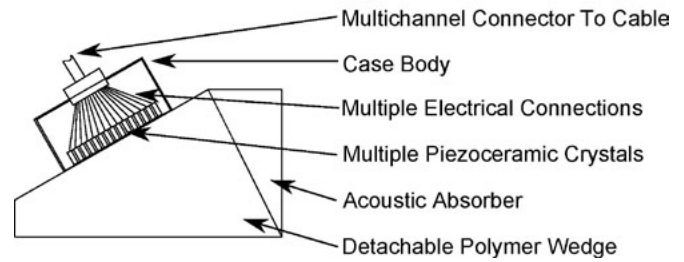
Angle Beam Transducers

Angle beam transducers create a beam of ultrasound at the specified angle to the normal to the inspection surface. Most angle beam transducers generate shear waves in the inspection material by refraction and mode conversion of a compression wave, however some refracted longitudinal angle beams are possible. Angle beam shoes or wedges, onto which the compression transducer is mounted are typically made of polymer such as acrylic or polystyrene. The shoe or wedge can be integral to the transducer or detachable and may be profiled and damped to minimise internal reflections. Dual element angle beam probes are also common, bringing the benefits of a dual probe to an angle beam.



Phased Array Transducers

Phased array transducers have multiple elements, typically ranging in number from 8 to 128. The elements may transmit simultaneously or individually in a timed sequence. This facilitates a variety of composite beam profiles to be synthesised significantly increasing the flexibility of the transducer's application. Phased array transducers can be used with delay-lines, angled wedges and water delay-lines. These can only be used with phased array instruments.



Immersion Transducers

Immersion transducers are design to operate submerged in water which provides the coupling and delay between the transducer and the test item. These transducers are commonly used in automated inspection systems which scan the probe over the test object and handle the ultrasonic inspection. These transducers can be flat faced and unfocused, or have profiled faces to focus them to a point or a line, referred to respectively as spherical and cylindrical focusing.

Immersion Transducer Focusing

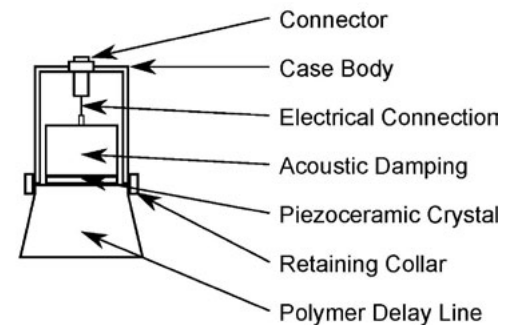
Cylindrical or Line Focusing

Spherical or Point Focusing



Delay Line Transducers

Delay line transducers transmit and receive sound waves with one element coupled to the surface, as with compression transducers. The crystal is held off from the surface of the test piece by a delay block. This permits inspection very close to the test piece surface.



Wheel Transducers

Wheel transducers combine aspects of immersion and delay-line transducers to create a probe where the contact with the test item is a rolling tyre. This facilitates the inspection of large areas or continuous feeds of material. The transducer is mounted in the hub of the wheel and the tyre is filled with water allowing the ultrasound to pass from the transducer, through the water, through the tyre and into the test item. The compliant rubber tyre material is carefully chosen to have an acoustic impedance that allows for good coupling to the test item with the minimum, or no couplant. Thus wheel probes are good for inspecting materials which are sensitive to conventional ultrasonic couplants.

Time-Of-Flight-Diffraction (TOFD) Transducers

TOFD transducers are especially high damped single element transducers that are used in conjunction with special wedges in a pitch-catch pair format. They are typically attached to the wedge by a quick change screw thread. The high damping produces the short pulse width and broadband response required by the TOFD technique, which assesses the different wave transit times between the transducers and in particular looks for transit time commensurate with a path involving diffraction from defects located midway between the pair of transducers.

Custom and Application Specific Transducers

Custom designed transducers are often required for the inspection of specialist parts. These often contain a number of elements facilitating the simultaneous inspection at specific locations and angles and often have integral or specialised couplant delivery systems. Some bespoke inspection tools contain several different types of transducer, such as phased array, time of flight diffraction and conventional ultrasonic probes. These systems are designed and optimised for customers' specific needs.

Material Acoustic Properties

Material	Longitudinal Velocity in/ μ s	Transverse Velocity in/ μ s	Longitudinal Velocity m/s	Transverse Velocity m/s	Density kg/m ³	Acoustic Impedance MRayl
Acrylic Resin (Perspex)	0.107	0.056	2730	1430	2252	3.22
Air	0.013	-	331	-	0.121	0.00
Alcohol (Ethanol)	0.045	-	1144	-	785	0.90
Alumina	0.427	-	10846	-	3974	43.10
Aluminium	0.249	0.123	6320	3100	2690	17.00
Beryllium	0.508	0.350	12900	8900	1822	23.50
Boron Epoxy	0.131	0.072	3327	1829	1918	6.38
Brass	0.168	0.790	3830	2100	8094	31.00
Bronze (Phopshor 5%)	0.139	0.088	3531	2235	8864	31.30
Carbon Fibre Epoxy Resin	0.121	0.056	3070	1415	1760	5.40
Castor Oil	0.058	-	1474	-	956	1.41
Concrete	0.167	0.135	4242	3429	2923	12.40
Graphite Epoxy	0.117	0.077	2972	1956	1760	5.40
Copper	0.183	0.089	4660	2300	8927	41.60
Ethylene Glycol	0.064	-	1626	-	1107	1.80
Fibreglass	0.131	0.072	3327	1829	1815	6.04
Glycerin	0.078	-	1920	-	1281	2.46
Glass	0.233	0.135	6800	6800	1676	11.40
Gold	0.128	0.047	3240	1200	19321	62.60
Granite	0.156	0.076	3962	193	2751	10.90
Inconel	0.290	0.119	5820	3020	8500	49.47
Iron	0.232	0.127	5900	3230	7700	45.43
Iron (cast)	0.189	0.094	4800	2600	6917	33.20
Kerosene	0.052	-	1324	-	820	1.09
Lead	0.085	0.028	2160	700	11338	24.49
Magnesium	0.248	0.130	6310	3000	1585	10.00
Manganese	0.183	0.093	4660	2350	7391	34.44



Material Acoustic Properties

Material	Longitudinal Velocity in/ μ s	Transverse Velocity in/ μ s	Longitudinal Velocity m/s	Transverse Velocity m/s	Density kg/m ³	Acoustic Impedance MRayl
Mercury	0.057	-	1450	-	13559	19.66
Molybdenum	0.248	0.132	6290	3400	10032	63.10
Monel	0.237	0.107	6020	2700	7907	47.60
Motor Oil (SAE 20 or 30)	0.069	-	1740	-	868	1.51
Nickel	0.222	0.117	5630	2960	8879	49.99
Octane	0.046	-	1171	-	690	0.81
Platinum	0.156	0.066	3960	1670	21399	84.74
Polycarbonate	0.090	-	2286	-	1185	2.71
Polyethylene	0.069	0.020	2670	500	637	1.70
Polystyrene (Rexolite)	0.093	-	2362	-	1058	2.50
Polyurethane	0.070	-	1900	-	1000	1.90
Polyvinylchloride (hard)	0.094	0.042	2395	1060	1399	3.35
Quartz (fused)	0.219	0.302	5563	7671	2607	14.50
Rubber (natural)	0.061	-	1549	-	1123	1.74
Rubber (silicone)	0.037	-	940	-	1489	1.40
Silver	0.142	0.063	3600	5920	10489	37.76
Mild Steel	0.232	0.128	5920	3230	7770	46.00
Stainless Steel	0.226	0.122	6070	3100	4498	27.30
Teflon	0.054	0.250	1372	6350	2187	3.00
Titanium	0.239	0.122	6070	3100	4498	27.30
Tungsten	0.204	0.113	5180	2870	19251	99.72
Tungsten Carbide	0.262	-	6655	-	10158	67.60
Uranium	0.133	0.066	3370	2000	18694	63.00
Water (20°C)	0.058	-	1480	-	1000	1.48
Zinc	0.164	0.095	4170	2410	7101	44.20
Zircaloy	0.186	0.093	4724	2362	9356	44.20
Zirconium	0.183	0.089	4650	2250	6480	30.13





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