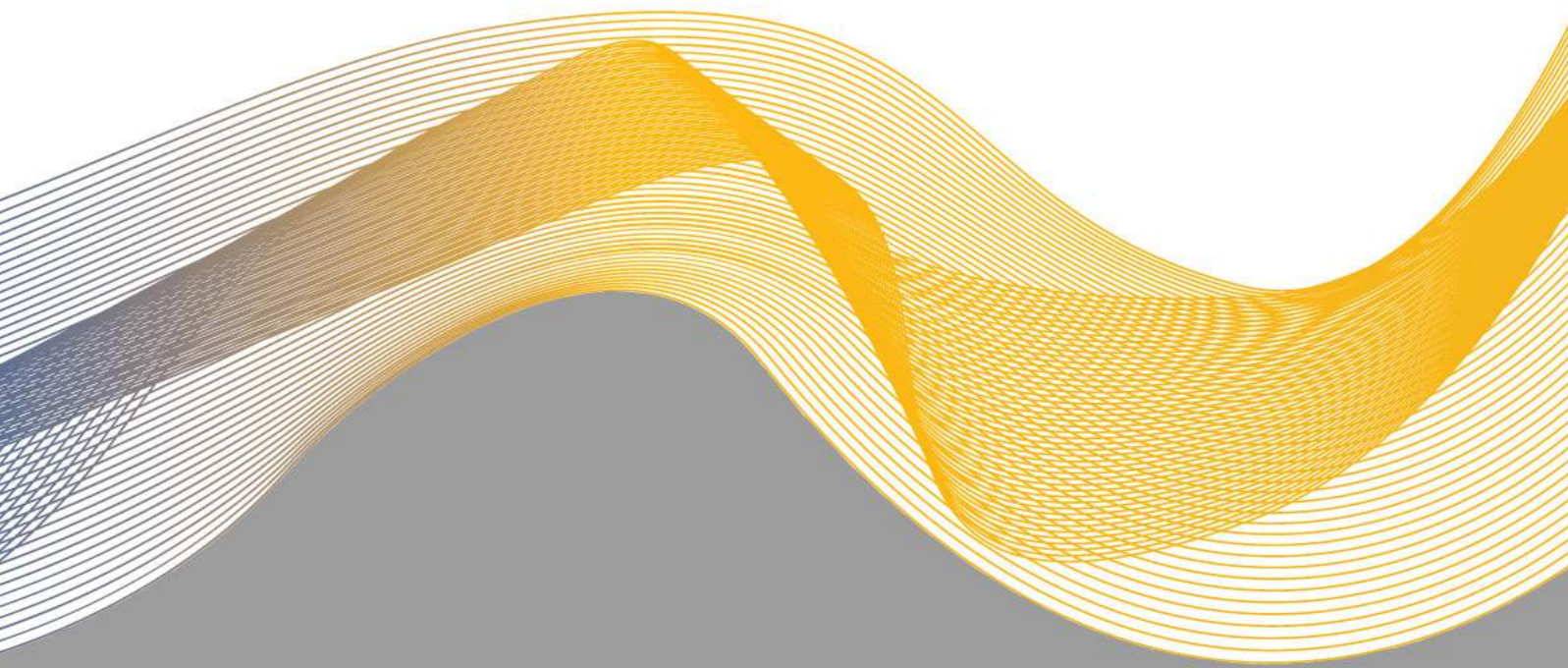


**Transducers  
and Accessories**  
**Catalogue**  
**Ver.12**



---

# Phoenix Inspection Systems Limited

---

Established in 1983, Phoenix Inspection Systems Limited are specialists in design and manufacture of ultrasonic non-destructive testing (NDT) solutions and offers a comprehensive range of manual and automated transducers, tools, scanners and manipulators. Phoenix ISL also specialise in application specific solutions, from a small modification to an existing product through to fully customised solutions. Our Technical Services team have the expertise to design and develop systems to meet the most challenging NDT inspections.

From the company headquarters in the U.K., Phoenix works in partnership with a global network of authorised distributors in 25 countries worldwide, providing expert product knowledge in convenient regional locations.

---



Phoenix ISL products encompass the full range of ultrasonic NDT techniques, including Phased Array, TOFD and Pulse-Echo and offer solutions to NDT professionals for:

- Weld testing
- Crack detection
- Corrosion mapping
- Composite inspection

## Phoenix Inspection Systems Limited holds the internationally recognised ISO 9001:2015 Quality Management Systems (QMS) Standard.

The standard focuses on performance by managing processes to ensure consistency in supply and our commitment to continuous improvement.



**Phoenix ISL products are used by some of the world's leading companies, to ensure safety standards and improve quality and efficiency and serve a wide range of industry sectors including:**



Oil, Gas & Petrochemical



Aerospace and Composites



Rail and Transport



Nuclear Power



Power Generation & Renewables

## Phoenix Transducers and Accessories

Over the past 38 years, Phoenix ISL has refined and developed a comprehensive range of high-performance ultrasonic transducers for general flaw detection and thickness measurement. Phoenix ISL transducers offer superior performance in a range of frequencies, crystal sizes, case construction, angles and connector types.

Transducers are produced at the company's headquarters in the UK and are verified in accordance with quality standard \*BS EN ISO 22232-2:2020.

### Standard Transducer Range

This catalogue features the comprehensive range of transducers available from Phoenix ISL conveniently organised into sections:

- Shear Wave
- Compression Wave
- Creep Wave
- Flexible Array
- High Temperature
- TOFD
- Phased Array

### Accessories

In addition to transducers, Phoenix ISL offers a wide range of accessories to complement their use:

- IR Emitters
- TOFD Wedges
- Phased Array Wedges
- Delay Lines
- Calibration Blocks
- Step Wedges
- Cables (with connector combinations)
- Adaptors



### Custom Design Transducers

Custom and application specific transducers are an alternative to our standard transducer ranges. Often, a small modification to an existing transducer will deliver an economical solution for your particular inspection needs.

For the more challenging applications, we can work with you to design and produce a fully customised transducer, which could help in the design of your inspection technique and procedure and may reduce overall inspection costs.

### **\*BS EN ISO 22232-2:2020 Non-destructive testing. Characterization and verification of ultrasonic test equipment. Probes.**

A 'BS EN ISO' standard is a UK version of a harmonised international standard that has been adopted by Europe as a European standard.

#### Disclaimer

The information in this brochure is accurate at time of publication. Actual products may differ from those presented herein. Phoenix Inspection Systems Limited reserves the right to change products, specifications and pricing without forward notice.

---

**For further information on Transducers or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



# Contents

<b>01 Shear Wave Transducers</b>	<b>7</b>	<b>05 TOFD Transducers and Wedges</b>	<b>27</b>
1.1 Single Crystal Shear Wave	8	5.1 De-mountable Piezo-composite TOFD	28
1.2 Shear Wave Gold Series	8	5.2 De-mountable Non-Composite TOFD	29
1.3 Twin Crystal Shear Wave	9	5.3 Mini TOFD	30
1.4 Twin Crystal Boiler Tube	9	5.4 Piezo-composite Mini TOFD	30
1.5 Automated Single Crystal Shear Wave	10	5.5 Delay Line Kits	30
1.6 Automated Shear Wave Gold Series	10	<b>TOFD Wedges</b>	<b>31</b>
1.7 Automated Twin Crystal Shear Wave	11	5.6 De-mountable TOFD Wedges - Plastic	32
1.8 Sub Miniature Single Crystal Shear Wave	11	5.7 De-mountable TOFD Wedges - Stainless Steel	33
<b>02 Compression Wave Transducers</b>	<b>13</b>	5.8 De-mountable TOFD Wedges - Brass	34
2.1 Single Crystal Compression Wave	14	5.9 WREN TOFD Wedges - Brass	34
2.2 Single Crystal Compression Wave – Stainless Steel	14	5.10 High Temperature WREN TOFD Wedges - Stainless Steel	35
2.3 Twin Crystal Compression Wave	15	5.11 High Temperature TOFD Wedges - Stainless Steel	35
2.4 Twin Crystal Compression Wave – Stainless Steel	16	5.12 M-Skip Probes and Wedges	36
2.5 Twin Crystal Compression Wave with Integral Lead or Side Entry	16	<b>06 Phased Array Transducers and Wedges</b>	<b>37</b>
2.6 Automated Single Crystal Compression Wave	17	6.1 Linear Phased Array Probe Range	38
2.7 Automated Twin Crystal Compression Wave	17	6.2 Phased Array Wedges	39
2.8 High Temperature Twin Crystal Compression Wave	18	<b>07 Corrosion Mapping Transducers and Accessories</b>	<b>41</b>
2.9 Creep Wave	18	7.1 Twin Crystal Compression Wave	42
2.10 Automated Creep Wave	19	7.2 High Temperature Twin Crystal Compression Wave	43
2.11 Single Crystal Angle Compression Wave	19	7.3 IR Emitters	43
2.12 Twin Crystal Angled Compression Wave	20	<b>08 Calibration Blocks</b>	<b>45</b>
<b>03 Flex Transducers and Cables</b>	<b>21</b>	8.1 Calibration Blocks	46
3.1 Flex – Single Element, Microdot	22	8.2 Step Wedges	49
3.2 Flex – Single Element (Composite), Microdot	22	<b>09 Accessories</b>	<b>51</b>
3.3 Cables for use with Flex, Microdot	22	9.1 Cables – 2m Long	52
<b>04 High Temperature Transducers</b>	<b>23</b>	9.2 Re-Shoe Kits	53
4.1 High Temperature Twin Compression: 80°C - 100°C	24	9.3 Adaptors	53
4.2 High Temperature Single Shear Wave: 120°C - 200°C	25	9.4 Certificates and Documents	54
4.3 High Temperature Stainless Steel Compression Wave	25	<b>10 Custom-Design Transducers</b>	<b>55</b>
		<b>11 Useful Information</b>	<b>57</b>
		11.1 Contouring Conventions	58

---

**For further information on Transducers or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*

# 01/

## Shear Wave Transducers



## 1.1 Single Crystal Shear Wave Transducers

The single crystal range of shear wave transducers are available with various angles and ideal for the general purpose testing of welds, plate, pipe tubing, castings and forgings. (See also GSW range section 1.2)



SSW Probe



RMSW Probe



LSW Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size L x W x H (mm)	Angle A°	Connector	
SSW 2/*A	2	10	29 x 16.5 x 24	38, 45, 60, 70	Subvis	Lemo 00
SSW 2.5/*A	2.5					
SSW 4/*A	4					
RMSW 2.5/*A	2.5	15	37 x 22 x 27	38, 40, 45, 70		
LSW 1/*A	1	20	51.5 x 26.5 x 30.5	38, 45, 60, 70		
LSW 2/*A	2					
LSW 4/*A	4					

\*A - please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

## 1.2 Shear Wave Gold Series Transducers

Phoenix developed the gold series transducer range to offer superior performance. Available with a stainless steel case, modified internal design and rear entry connectors, gold series transducers provide exceptional results.

- Supplied with Lemo 00 connectors
- 4MHz GSW probes manufactured with composite crystal



GSW 2MHz 45° Probe



GSW 4MHz Composite Probe

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Angle A°	Connector
GSW 2/*A	2	8 x 9	29 x 17 x 22.5	38, 45, 60, 70	Lemo 00
GSW 4/*A-C	4			70	
GSW 4/70-C Forward Emission 7mm					

\*A - please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).



### 1.3 Twin Crystal Shear Wave Transducers

Twin crystal shear wave transducers hold two crystals mounted at inward angles that provide improved near-surface resolution and superior signal-to-noise ratio. Ideal for inspecting thin materials for small flaws, occurring directly under the surface.



TSW Probe

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Angle A°	Connector
TSW 2/*A	2	2 (4 x 8)	29 x 16.5 x 24	38, 45, 60, 70	Subvis
TSW 4/*A	4				

\*A - please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

### 1.4 Twin Crystal Boiler Tube Transducers

The TBP range has been specifically designed for use on boiler tubes. It features exceptional gain and resolution together with very low crosstalk. The emission point is less than 8mm from the front of the housing. Four stainless steel wear studs are fitted to prevent unnecessary wear.



TBP Probe

Product Code	Frequency MHz	Composite Crystal Size (mm)	Probe Size L x W x H (mm)	Angle A°	Integral 2m Lead
TBP 5/70 L	5	2 (3 x 6)	22 x 17 x 13	70	Lemo No 1
TBP 5/70 BNC					BNC
TBP 5/70 L00					Lemo 00

Also available in 45° and 60° angles. Please specify requirement when ordering.

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

### 1.5 Automated Single Crystal Shear Wave Transducers

Manufactured in a 30 x 30mm case with gimbal pins, ASSW probes are designed for use with the extensive range of Phoenix manual and automated scanners. Suitable for use in scanners with 30 x 30mm forks for general purpose testing of welds, plate, pipe tubing, castings and forgings. Supplied with:

- Couplant irrigation, electrically isolated connector and M4 gimbal mountings
- Lemo 00 connectors



ASSW 45° Probe



ASSW 60° Probe



ASSW 70° Probe

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Angle A°	Connector
ASSW 2/*A	2	10	30 x 30 x 28	38, 45, 60, 70	Lemo 00
ASSW 2.5/*A	2.5				
ASSW 4/*A	4				

\*A - please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional charge per probe (please specify relative to beam direction).

### 1.6 Automated Shear Wave Gold Series Transducers

Developed by Phoenix, AGSW probes offer superior performance and provide exceptional results when used in manual or automated scanners with 30 x 30mm forks. The 4MHz AGSW includes a modified internal design with the addition of an interface layer. Supplied with:

- Couplant irrigation, electrically isolated connector and M4 gimbal mountings
- Lemo 00 connectors
- 4MHz AGSW probes manufactured with composite crystal
- 30 x 30mm case



AGSW Probe

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Angle A°	Connector
AGSW 2/*A	2	8 x 9	30 x 30 x 28	38, 45, 60, 70	Lemo 00
AGSW 4/*A	4				

\*A - please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional charge per probe (please specify relative to beam direction).

## 1.7 Automated Twin Crystal Shear Wave Transducers

ATSW probes hold two crystals mounted at inward angles that provide improved near-surface resolution and superior signal-to-noise ratio. Manufactured in a 30 x 30mm case with gimbal pins, ATSW probes are designed for use with the extensive range of Phoenix manual and automated scanners and ideal for inspecting thin materials for small flaws occurring directly under the surface. Supplied with:

- Couplant irrigation, electrically isolated connector and M4 gimbal mountings
- Lemo 00 connectors



ATSW Probe

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Angle A°	Connector
ATSW 2/*A	2	2 (4 x 8)	30 x 30 x 28	38, 45, 60, 70	Lemo 00
ATSW 4/*A	4				

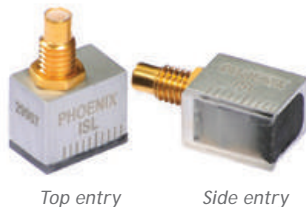
\*A - please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional charge per probe (please specify relative to beam direction).

## 1.8 Sub Miniature Single Crystal Shear Wave Transducers

Ideal for inspections in areas with reduced access.

- Available with side or top entry connectors



SMS Probes

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Angle A°	Connector
SMS 5/*A/SE	5	5 x 5	12.7 x 8 x 10.75	38, 40, 45, 60, 70	Side Entry Subvis
SMS 7.5/*A/SE	7.5				
SMS 5/*A/TE	5				Top Entry Subvis
SMS 7.5/*A/TE	7.5				

Please specify material to be inspected when ordering. i.e. steel or aluminium.

\*A - please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

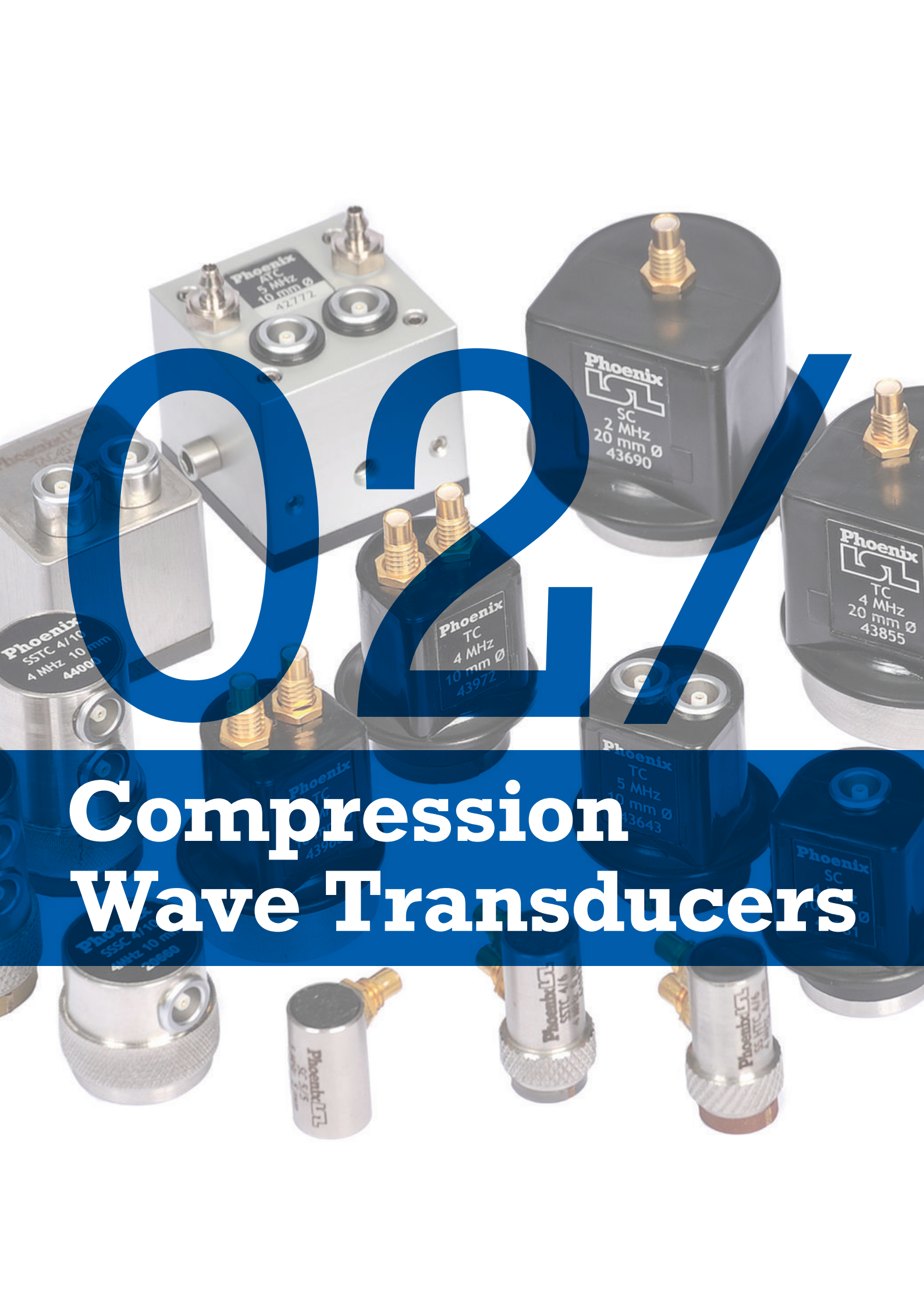
- Probe dimensions supplied exclude connectors, gimbal pins and couplant nozzles
- Probe diameter measurements are to the widest point
- Contouring available per probe (please specify relative to beam direction)
- Please refer to Section 9.4 for transducer certificate and document options

- Technical datasheets available free of charge upon request, for certain transducers across the range
- Conditions of sale are available upon request
- Certificate of Conformity supplied free of charge with all probes

**For further information on Shear Wave Transducers or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** sales@phoenixisl.com

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



# Compression Wave Transducers



## 2.1 Single Crystal Compression Wave Transducers

Single crystal compression wave probes are used to measure thickness and detect flaws on plates, bars, forgings and castings.

- Constructed in a durable plastic case with a ceramic face and integrated stainless steel wear ring.



SC 10mm Probe



SC 20mm Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size Dia x H (mm)	Connector	
SC 1/20	1	20	40 x 35	Subvis	Lemo 00
SC 2/20	2				
SC 2.5/10	2.5	10	27 x 30		
SC 4/10	4				
SC 4/20		20	40 x 35		
SC 5/10	5	10	27 x 30		
SC 5/20		20	40 x 35		

## 2.2 Single Crystal Compression Wave Transducers – Stainless Steel

This range of compression wave probes are manufactured in stainless steel cases for extra durability.



SSSC 6mm Probe



SSSC 10mm Probe



SSSC 5mm Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size Dia x H (mm)	Connector
SSSC 1/20	1	20	31 x 20	Lemo 00
SSSC 2/20	2			
SSSC 2.5/10	2.5	10	20 x 30	Subvis
SSSC 4/6	4	6	10 x 18	Lemo 00
SSSC 4/10		10	20 x 30	
SSSC 4/20		20	31 x 20	
SSSC 5/20	5	5	10 x 18	Subvis
SSSC 5/5				

2.3 Twin Crystal Compression Wave Transducers

Twin crystal compression wave probes are suitable for use on corroded and pitted surfaces, thickness measurement, brazed joint testing and for lamination detecting. High gain and resolution are achieved with a very low cross-talk.

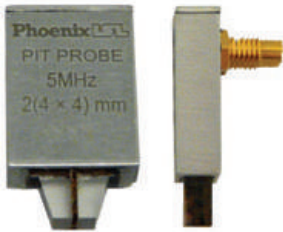
■ Wear rings available for 10mm and 20mm TC probes - see below to order separately



TC 4/10S Probe



TC 5/10L Probe



Pit Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Nominal Focus (mm)	Probe Size Dia x H (mm)	Connector	
TC 2.5/10	2.5	10	13	27 x 30	Subvis	Lemo 00
TC 4/10	4		15			
TC 5/10	5		16			
TC 5/10 SF			8			
TC 1/20	1	20	28	40 x 35		
TC 2/20	2					
TC 4/20	4					
TC 5/20	5					
PIT-PROBE		2 (4 x 4)	6	L 7 x W 19 x H 34		

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).



Wear Rings for 10mm and 20mm Probes



10mm Probe with Wear Ring



20mm Probe with Wear Ring

Options
Wear Rings (only on TC 10mm and 20mm crystal dia probes)

## 2.4 Twin Crystal Compression Wave Transducers – Stainless Steel

Standard twin crystal transducers housed in a stainless steel case for extra durability.



SSTC 4/10L Probe



SSTC 4/6S Probe



SSTC 5/5S Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Nominal Focus (mm)	Probe Size Dia x H (mm)	Connector
SSTC 2/20	2	20	28	31 x 41	Lemo 00
SSTC 2.5/10	2.5	10	12	20 x 33	
SSTC 4/6	4	6	8	12 x 24	Subvis
SSTC 4/10		10	12	20 x 33	Lemo 00
SSTC 4/20		20	28	31 x 41	
SSTC 5/5	5	5	5	10 x 25	Subvis
SSTC 5/10	5	10	12	20 x 33	Lemo 00
SSTC 5/20		20	28	31 x 41	
SSTC 10/6 12mm Ø case	10	6	3	12 x 25	Subvis
SSTC 10/6 20mm Ø case				20 x 33	Lemo 00

## 2.5 Twin Crystal Compression Wave Transducers with Integral Lead

Twin crystal compression wave probes are suitable for use on corroded and pitted surfaces, thickness measurement, brazed joint testing and lamination detecting. High gain and resolution are achieved with a very low cross-talk.

- Integral lead length 2m as standard



TC 5/5 Integral Lead

Product Code	Frequency MHz	Composite Crystal Dia (mm)	Nominal Focus (mm)	Probe Size Dia x H (mm)	Integral 2m Lead
TC 5/5 Int Lead L	5	5	5	19-10 x 21	Lemo No 1
TC 5/5 Int Lead BNC					BNC
TC 5/5 Int Lead L 00				10 x 25	Lemo 00

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

## 2.6 Automated Single Crystal Compression Wave Transducers

ASC probes are designed for use with the extensive range of Phoenix manual and automated scanners.

Supplied with:

- Couplant irrigation, electrically isolated connector and M4 gimbal mountings
- Lemo 00 connectors



ASC Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size L x W x H (mm)	Connector
ASC 2.5/10	2.5	10	30 x 30 x 28	Lemo 00
ASC 4/10	4			
ASC 5/10	5			

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

## 2.7 Automated Twin Crystal Compression Wave Transducers

ATC probes hold two crystals mounted at inward angles that provide improved near-surface resolution and superior signal-to-noise ratio.

- Supplied with couplant irrigation, electrically isolated connector and M4 gimbal mountings



ATC Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Nominal Focus (mm)	Probe Size L x W x H (mm)	Connector
ATC 2.5/10-L	2.5	10	12	30 x 30 x 28	Lemo 00
ATC 4/10-L	4				
ATC 5/10-L	5		8		
ATC 5/10 SF-L					
ATC 1/20-L	1	20	28	40 x 40 x 34.5	
ATC 2/20-L	2				
ATC 4/20-L	4				

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

## 2.8 High Temperature Twin Crystal Compression Wave Transducers

Durable steel cased twin compression wave transducers with side entry connectors. (See section 4 for the full range of high temperature transducers).

- Recommended temperature rating:
  - Continuously at 120°C
  - Intermittently at 200°C i.e. 10 sec contact with 1 minute air cooling



SSHTC 4/10 Probe



SSHTC 4/6 Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Nominal Focus (mm)	Probe Size Dia x H (mm)	Connector
SSHTC 1/20	1	20	28	31 x 41	Lemo 00
SSHTC 2.5/10	2.5	10	12	20 x 33	
SSHTC 4/6	4	6	8	12 x 25	Subvis
SSHTC 4/10		10	12	20 x 33	Lemo 00
SSHTC 4/20		20	28	31 x 41	
SSHTC 5/10	5	10	12	20 x 33	
SSHTC 5/20		20	28	31 x 41	

## 2.9 Creep Wave Transducers

Twin crystal short focus probes for detecting near surface defects.

Note: The useful inspection range for CW probes is limited by mode conversion effects.

- Designed for use on carbon steel (Austenitic available on request)

Supplied with:

- Top entry Lemo 00 connectors
- Certificate of Individual Parameters



Creep Wave Probe

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Connector
CW 2/13	2	2 (6 x 13)	25 x 25 x 25	Lemo 00
CW 2/20		2 (10 x 20)	30 x 30 x 28	
CW 4/13	4	2 (6 x 13)	25 x 25 x 25	
CW 4/20		2 (10 x 20)	30 x 30 x 28	

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).



## 2.10 Automated Creep Wave Transducers

The ACW range are twin crystal short focus irrigated probes for detecting near surface defects and designed for use with the extensive range of Phoenix manual and automated scanners.

Note: The useful inspection range for ACW probes is limited by mode conversion effects.

- For scanners with 30 x 30mm forks (other options available)

Supplied with:

- Top entry Lemo 00 connectors
- Certificate of Individual Parameters
- Couplant irrigation, electrically isolated connector and M4 gimbal mountings (and wear pins)



ACW 4/13 Probe

Product Code	Frequency MHz	Crystal Size (mm)	Probe Size L x W x H (mm)	Connector
ACW 2/13	2	2 (6 x 13)	30 x 30 x 28	Lemo 00
ACW 2/20*		2 (10 x 20)		
ACW 4/13	4	2 (6 x 13)		
ACW 4/20*		2 (10 x 20)		

\*ACW 4/20 and ACW 2/20 do not include wear pins.

Probe contouring available on request at additional cost per probe (please specify relative to beam direction).

## 2.11 Single Crystal Angle Compression Wave Transducers

Single crystal angled beam compression wave transducers are used for the inspection of coarse grained and attenuative materials such as stainless steel or duplex.



SAC Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size L x W x H (mm)	Angle A°	Connector	
SAC 2/*A	2	10	29 x 17 x 20	38, 45, 60, 70	Subvis	Lemo 00
SAC 2.5/*A	2.5					
SAC 4/*A	4					
LAC 1/*A	1	20	51.5 x 26.5 x 30.5			
LAC 2/*A	2					
LAC 4/*A	4					

\*A - Please insert angle required. Additional charge for non-standard angles.

Probe contouring available on request at additional charge per probe (please specify relative to beam direction).

## 2.12 Twin Crystal Angled Compression Wave Transducers

TAC probes can be used on a wide range of materials. They offer improved resolution and signal-to-noise ratio when inspecting coarse-grained and attenuative materials due to the in-built focussing of the probes.

- Standard TAC probes are designed for use on carbon steel. If inspecting other materials please state this when placing an order.
- Other focal depths and frequencies available on request

Supplied with:

- Top entry Lemo 00 connectors
- Certificate of Individual Parameters (pre-contouring)



Range of TAC Probes

Product Code	Frequency MHz	Angle A°	Crystal Size (mm)	Probe Size L x W x H (mm)	Focal Depth (mm)	Connector
TAC F/A/25	2, 4	45, 60, 70	2 (6 x 13)	25 x 25 x 25	12	Lemo 00
TAC F/A/30			2 (8 x 15)	30 x 30 x 28	18	

Additional charge, per probe, applies for non-standard:

- Angles, Frequencies and Focal depths
- Probes for other material velocities
- Probe Contouring (please specify relative to beam direction)

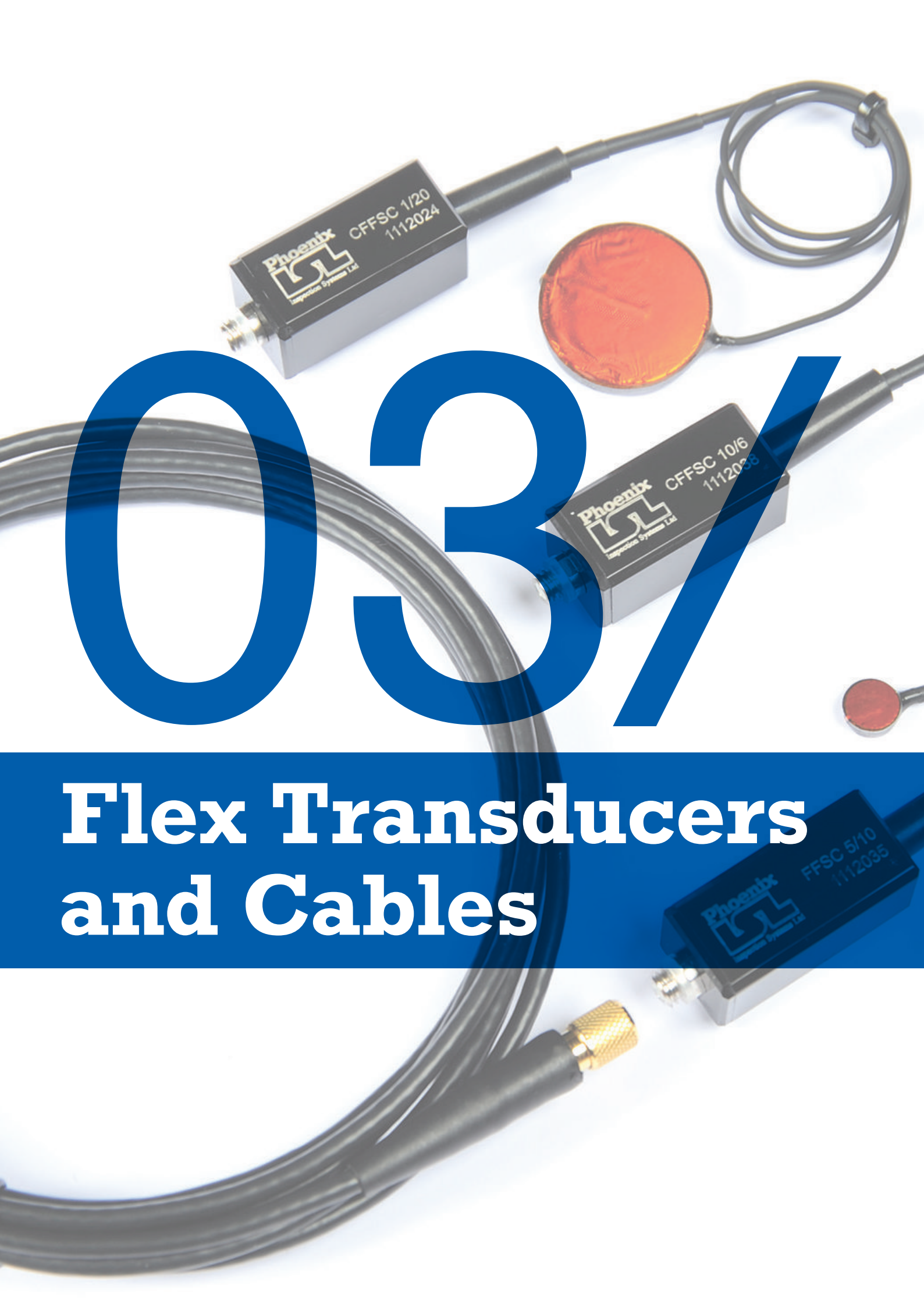
- Probe dimensions supplied exclude connectors, gimbal pins and couplant nozzles
- Probe diameter measurements are to the widest point
- Contouring available per probe (please specify relative to beam direction)
- Please refer to Section 9.4 for transducer certificate and document options

- Technical datasheets available free of charge upon request, for certain transducers across the range
- Conditions of sale are available upon request
- Certificate of Conformity supplied free of charge with all probes

**For further information on Compression Wave Transducers or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** sales@phoenixisl.com

Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12

The background of the slide features three Phoenix CFFSC transducers and their associated cables. The transducers are black rectangular units with the Phoenix logo and 'Inspection Systems Ltd' printed on them. One is labeled 'CFFSC 1/20 1112024', another 'CFFSC 10/6 1112038', and the third 'CFFSC 5/10 1112035'. They are connected to various types of cables, including a thick grey braided cable and thinner black cables with different connectors. A circular orange sensor is also visible.

# 03/

## **Flex Transducers and Cables**

## Flex Transducers and Cables



Flex transducers are ideal for inspecting radius areas of composites and accessing complex geometries in metals, such as weld cap areas or castings.

The transducers are thin, compliant ultrasonic probes that can conform to curved surfaces using finger-tip pressure.

Flex transducers are made of a thin but durable piezo-electric material that is soft enough to bend and can be shaped to suit curved geometry.

The Flex series are available as single element (FFSC) and composite single element (CFFSC).

### 3.1 Flex Transducers – Single Element, Microdot

Product Code	Frequency MHz	Crystal Dia (mm)
FFSC 1/10	1	10
FFSC 1/20		20
FFSC 2/6	2	6
FFSC 2/10		10
FFSC 2/15		15
FFSC 2/20		20
FFSC 3.5/6	3.5	6
FFSC 3.5/10		10
FFSC 3.5/15		15
FFSC 3.5/20		20
FFSC 5/6	5	6
FFSC 5/10		10
FFSC 5/15		15
FFSC 5/20		20
FFSC 10/6	10	6
FFSC 10/10		10

### 3.2 Flex Transducers – Single Element (Composite), Microdot

Product Code	Frequency MHz	Crystal Dia (mm)
CFFSC 1/10	1	10
CFFSC 1/20		20
CFFSC 2/6	2	6
CFFSC 2/10		10
CFFSC 2/15		15
CFFSC 2/20		20
CFFSC 3.5/6	3.5	6
CFFSC 3.5/10		10
CFFSC 3.5/15		15
CFFSC 3.5/20		20
CFFSC 5/6	5	6
CFFSC 5/10		10
CFFSC 5/15		15
CFFSC 5/20		20
CFFSC 10/6	10	6
CFFSC 10/10		10

### 3.3 Cables for use with Flex Transducers, Microdot

Product Code	Description	Instrument Connector
PCL00-M	Single 2m cable	Lemo 00
PCL1-M		Lemo 1
PCBNC-M		BNC
TPCL00-M	Twin 2m cable	Lemo 00
TPCL1-M		Lemo 1
TPCBNC-M		BNC

- Please refer to Section 9.4 for transducer certificate and document options
- Technical datasheets available free of charge upon request, for certain transducers across the range
- Conditions of sale are available upon request

**For further information on Flex Transducers and Cables or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** sales@phoenixisl.com





# High Temperature Transducers



## High Temperature Transducers

Many applications call for transducers to be used in harsh environments, such as high temperatures. The Phoenix ISL range of high temperature probes allow rapid and cost effective testing by removing the need to cool surfaces in advance and are available in a variety of transducer designs to perform reliably on surfaces at temperatures from 80°C to 200°C.

Special formulated high temperature couplants are required for use with these probes and care should be taken to use the correct couplant for the temperature of the component to be inspected. As a general guideline duty cycles of no more than 10 seconds with the hot surface followed by a minute of air cooling is advised. (See also section 10 for other special transducers for use in harsh environments).

### 4.1 High Temperature Twin Compression Transducers: 80°C - 100°C



HTC Probe

**HTC range - Durable plastic case**

Recommended temperature rating:

- Continuously at 80°C
- Intermittently at 100°C i.e. 10 sec contact with 1 minute air cooling

Product Code	Frequency MHz	Crystal Dia (mm)	Nominal Focus (mm)	Probe Size Dia x H (mm)	Price £ (GBP) Connector	Connector	
HTC 2.5/10	2.5	10	12	27 x 30	-	Subvis	Lemo 00
HTC 4/10	4						
HTC 5/10	5						
HTC 5/5 integral 2m lead		5	5	19-10 x 21	Lemo No 1 only	-	-
HTC 5/5 integral 2m lead					BNC only		

Probe contouring available on request at additional charge per probe (please specify relative to beam direction).

## 4.2 High Temperature Single Shear Wave Transducers: 120°C - 200°C



HSSW Probe

### HSSW Range - Metal case

Recommended temperature rating:

- Continuously at 120°C
- Intermittently at 200°C i.e. 10 sec contact with 1 minute air cooling

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size L x W x H (mm)	Angle A°	Connector	
HSSW 2/*A	2	10	29 x 16.5 x 24	38, 45, 60, 70	Subvis	Lemo 00
HSSW 4/*A	4					

\*A - Please insert angle required. Additional charge for non-standard angles. Angles are measured at RTP -20°C  
Probe contouring available on request at additional charge per probe (please specify relative to beam direction).

## 4.3 High Temperature Stainless Steel Compression Wave Transducers



SSHTC 4/10 Probe



SSHTC 4/6 Probe

### SSHSC (single compression) and SSHTC (twin compression) ranges - Stainless Steel case

Durable steel cased compression wave transducers with side entry connectors.

Recommended temperature rating:

- Continuously at 120°C
- Intermittently at 200°C i.e. 10 sec contact with 1 minute air cooling

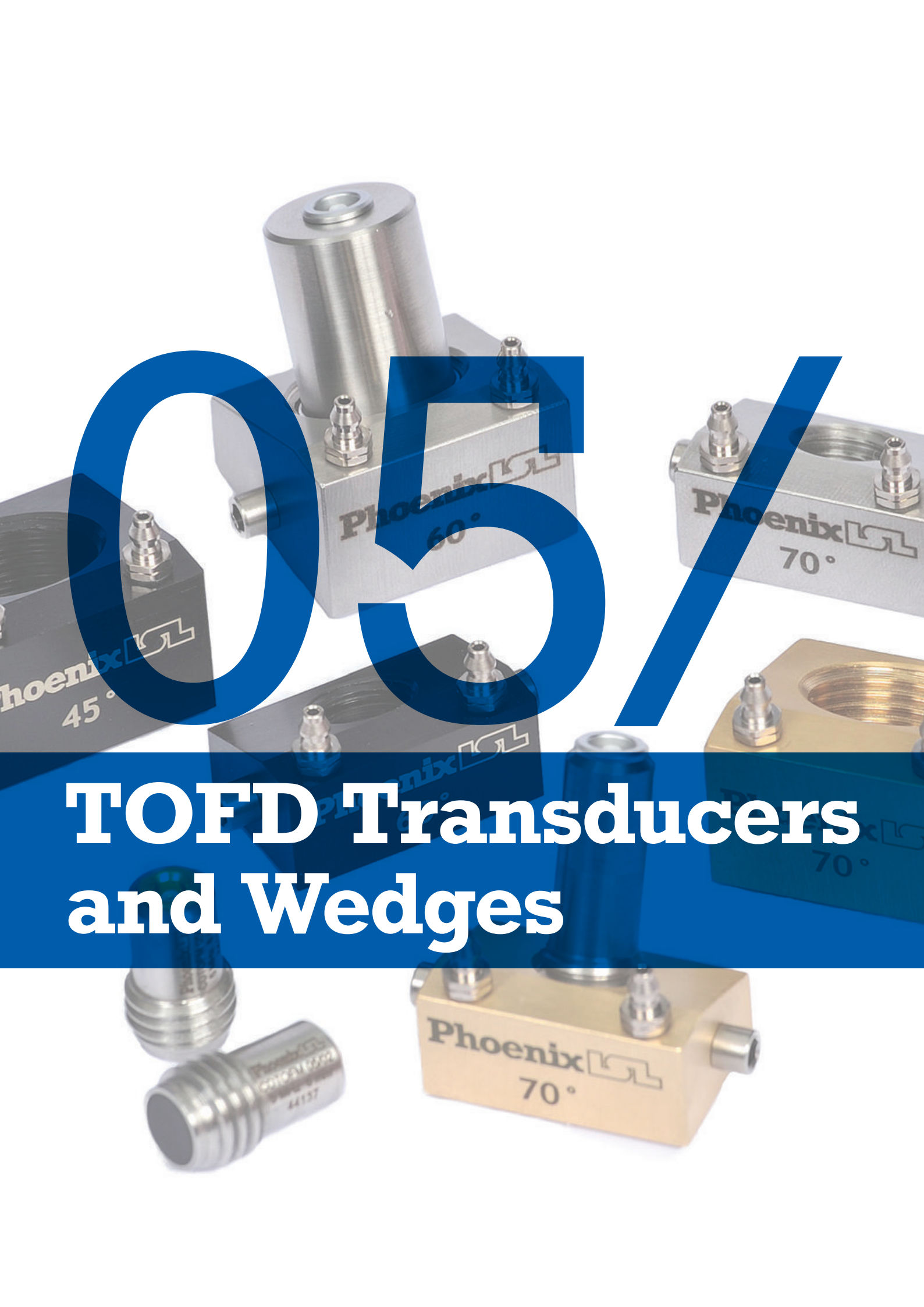
Product Code	Frequency MHz	Crystal Dia (mm)	Nominal Focus (mm)	Probe Size Dia x H (mm)	Connector
SSHSC 4/10	4	10	N/A	20 x 30	Lemo 00
SSHTC 1/20	1	20	28	31 x 41	
SSHTC 2/20L	2				
SSHTC 2.5/10	2.5	10	12	20 x 33	
SSHTC 4/6	4	6	8	12 x 25	Subvis
SSHTC 4/10		10	12	20 x 33	Lemo 00
SSHTC 4/20		20	28	31 x 41	
SSHTC 5/10	5	10	12	20 x 33	
SSHTC 5/20		20	28	31 x 41	

- Probe dimensions supplied exclude connectors, gimbal pins and couplant nozzles
- Probe diameter measurements are to the widest point
- Contouring available per probe (please specify relative to beam direction)
- Please refer to Section 9.4 for transducer certificate and document options

- Technical datasheets available free of charge upon request, for certain transducers across the range
- Conditions of sale are available upon request
- Certificate of Conformity supplied free of charge with all probes

**For further information on High Temperature Transducers or to place an order, contact the sales team:**  
**t:** +44 (0) 1925 826000 | **e:** sales@phoenixisl.com

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



# TOFD Transducers and Wedges

## TOFD Transducers and Wedges

TOFD transducers and wedges generate refracted longitudinal waves in steel. These highly damped longitudinal wave probes provide a high resolution and performance.

Phoenix ISL manufactures a wide range of composite and non-composite TOFD transducers of varying frequencies from 2MHz to 15MHz and crystal diameters ranging from approximately 3mm (0.125") to 20mm (0.787"). They are for use with the Phoenix ISL range of TOFD wedges.

### 5.1 De-mountable Piezo-composite TOFD Transducers

Phoenix ISL offers a full range of transducers designed specifically for TOFD applications. They are highly damped transducers in a threaded housing, for use with demountable wedges in piezo-composite materials.

- Case height 30mm (approximately)
- For use with Phoenix ISL TOFD wedges
- Probes fitted with Lemo 00 connectors



M12 TOFD Probe



M20 TOFD Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size Dia x H (mm)	Thread Size	Connector
CDTOF 2/02	2	6	10 x 30	M12	Lemo 00
CDTOF 2/04		12	17 x 30	M20	
CDTOF 3.5/03	3.5	9		10 x 30	
CDTOF 3.5/04		12	17 x 30		
CDTOF 5/01	5	3		10 x 30	
CDTOF 5/02		6			
CDTOF 5/03		9	17 x 30	M20	
CDTOF 5/04		12			
CDTOF 7.5/01	7.5	3	10 x 30	M12	
CDTOF 7.5/02		6			
CDTOF 10/01	10	3			
CDTOF 10/02		6			
CDTOF 15/01	15	3			
CDTOF 15/02		6			



## 5.2 De-mountable Non-Composite TOFD Transducers

Highly damped ceramic faced transducers in a threaded housing. For use with high temperature wedges - see Sections 5.9 and 5.10.

- Case height 30mm
- Probes fitted with Lemo 00 connectors



M12 TOFD Probe



M20 TOFD Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Probe Size Dia x H (mm)	Thread Size	Connector
DTOF 2/04	2	12	10 x 30	M20	Lemo 00
DTOF 2/06		20	17 x 30	M30	
DTOF 3.5/03	3.5	9		M20	
DTOF 3.5/04		12			
DTOF 5/01	5	3		10 x 30	
DTOF 5/02		6			
DTOF 5/03		9	17 x 30	M20	
DTOF 5/04		12			
DTOF 7.5/01	7.5	3	10 x 30	M12	
DTOF 7.5/02		6			
DTOF 10/01	10	3			
DTOF 10/02		6			
DTOF 15/01	15	3			
DTOF 15/02		6			

## 5.3 Mini TOFD Transducers

Highly damped TOFD transducers, for use in confined spaces.

- Case height 20mm
- Probes fitted with MCX connector only



M12 Mini TOFD Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Thread Size	Connector
DTOFM-5/01	5	3	M12	MCX
DTOFM-10/01	10			
DTOFM-15/01	15			
DTOFM-5/02	5	6		

5.4 Piezo-composite Mini TOFD Transducers

Highly damped TOFD transducers in a piezo-composite material, for use in confined spaces.

- Case height 20mm
- Probes fitted with MCX connector only



CDTOFM Probes

Product Code	Frequency MHz	Crystal Dia (mm)	Thread Size	Connector
CDTOFM-5/01	5	3	M12	MCX
CDTOFM-10/01	10			
CDTOFM-15/01	15			
CDTOFM-5/02	5	6		

5.5 Delay Line Kits for TOFD Transducers

Delay Line converter kits are a simple solution to incorporate a delay line in front of Phoenix ISL standard TOFD transducer elements. Delay Lines offer improved resolution of flaws very near to the surface of a part by removing any unwanted initial pulse. Delay Lines allow thinner range and more accurate thickness measurements of materials.

- Kits include either M12 or M20 collar and delay line
- Collars 10mm thick
- Standard Kits suitable for use up to 60°C

High Temperature Delay Lines

High Temperature Delay Lines are also available. Care should be taken to use the correct couplant for the temperature of the component to be inspected. As a general guideline duty cycles of no more than 10 seconds of contact with the hot surface, followed by one minute of air cooling time is advised.

- Suitable for use up to 120°C



Standard Delay Line Kit



High Temperature Delay Line Kit



TOFD Probe with Delay Line Kit

Product Code	Kit Description	Collar Thread Size
M12-ST-DLINE	Standard Temperature Delay Line Kit	M12
M20-ST-DLINE		M20
M12-HT-DLINE	High Temperature Delay Line Kit	M12
M20-HT-DLINE		M20

## TOFD Wedges

Phoenix produces a wide range of Time of Flight Diffraction wedges manufactured from durable plastic, brass or stainless steel. The wedges fit the universal Metric Threaded probes (M12, M20 and M30) and are suitable for use with the Phoenix ISL range of TOFD probes.

- All TOFD wedges are supplied with M3 irrigation channels as standard



### Technical Specification

- Sound Velocity: 2320m/s.
- Beam angles specified are for longitudinal waves.
- Nozzle fits a 2.5-3mm tube.
- Gimbal centre is 7.00mm from wedge base.
- Gimbal is 5mm Ø x 3.85mm long (hex 3mm key).
- All wedges are irrigated as standard and can be coupled with couplant gel or water as required.

Wedge Product Code	Beam Angle	Thread Size	To Fit Probe Types	W x L (mm)	Wedge Delay		Emission point (mm from front)
					mm	µs	
WTOFI 12/45	45°	M12	M12 DTOF and CDTOF 3-6mm Ø	30 x 20	7.1	3.06	8
WTOFI 12/60	60°				7.0	3.01	
WTOFI 12/70	70°				7.0	3.01	
WTOFI 20/45	45°	M20	M20 DTOF and CDTOF 9-12mm Ø	30 x 30	8.1	3.42	13
WTOFI 20/60	60°				7.5	3.25	
WTOFI 20/70	70°					3.25	
WTOFI 30/45	45°	M30	M30 DTOF and CDTOF 20mm Ø	40 x 45	7.5	3.25	20
WTOFI 30/60	60°				7.5	3.25	
WTOFI 30/70	70°				7.5	3.25	

Wedges can be contoured to suit any surface profile - Diameter and direction must be stated.

### Accessories

- Wear Plates or Couplant Skids must be ordered with the wedge as the addition of M3 x 5 deep hole is required. Wear plates are available for the front and rear of the wedge.
- Side Skids are available but incompatible with tool-post applications.

### Usage

Couplant must be applied to the probe face and the wedge shoe during use (this can be pumped or applied manually). Phoenix Inspection Systems Limited assumes no responsibility, explicit or implicit, if these results are found to vary under different test conditions.

5.6 De-mountable TOFD Wedges - Plastic

For use with DTOF and CDTOF transducers. Manufactured in black plastic with irrigation and gimbal pin options.

N.B. M30 thread wedges are 40mm wide. All other wedges are 30mm wide

■ Contoured wedges available on request



Plastic De-mountable TOFD Wedges

Product Code	Beam Angle	Thread Size
WTOFI 12/45	45°	M12
WTOFI 12/60	60°	
WTOFI 12/70	70°	
WTOFI 20/45	45°	M20
WTOFI 20/60	60°	
WTOFI 20/70	70°	
COUPLANT SKIDS - FR	1 set per wedge (1 x front and 1 x rear)	

Non-standard wedge angles available at additional cost.  
Contoured wedges available at additional cost per wedge or per pair.

5.7 De-mountable TOFD Wedges - Stainless Steel

For use with DTOF and CDTOF transducers. Manufactured in stainless steel with irrigation and gimbal pin options.

N.B. M30 thread wedges are 40mm wide. All other wedges are 30mm.

■ Contoured wedges available on request



Stainless Steel De-mountable TOFD Wedges

Product Code	Beam Angle	Thread Size
WTOF-SSI-12/45	45°	M12
WTOF-SSI-12/60	60°	
WTOF-SSI-12/70	70°	
WTOF-SSI-20/45	45°	M20
WTOF-SSI-20/60	60°	
WTOF-SSI-20/70	70°	
COUPLANT SKIDS - FR	1 set per wedge (1 x front and 1 x rear)	

Non-standard wedge angles available at additional cost.  
Contoured wedges available at additional cost per wedge or per pair.



## 5.8 De-mountable TOFD Wedges - Brass



For use with DTOF and CDTOF transducers. Manufactured in brass with irrigation and gimbal pin options.

N.B. M30 thread wedges are 40mm wide. All other wedges are 30mm.

■ Contoured wedges available on request

Brass De-mountable TOFD Wedges

Product Code	Beam Angle	Thread Size
WTOF-BI-12/45	45°	M12
WTOF-BI-12/60	60°	
WTOF-BI-12/70	70°	
WTOF-BI-20/45	45°	M20
WTOF-BI-20/60	60°	
WTOF-BI-20/70	70°	
COUPLANT SKIDS - FR	1 set per wedge (1 x front and 1 x rear)	

Non-standard wedge angles available at additional cost.  
Contoured wedges available at additional cost per wedge or per pair.

## 5.9 WREN TOFD Wedges – Brass



Ideal for use with the WREN Scanner and DTOF and CDTOF transducers with a reduced land, enabling wedges to sit closer to the weld cap. Includes irrigation and gimbal pin options.

■ Contoured wedges available on request

WREN TOFD Wedge - Brass

Product Code	Beam Angle	Thread Size	W x L (mm) (Contact face)	Wedge Delay		Emission Point
				mm	µs	
WRENI 12/45	45°	M12	30 x 8.5	10.3	4.44	4
WRENI 12/60	60°		30 x 9	10.0	4.31	
WRENI 12/70	70°			9.8	4.22	

Non-standard wedge angles available at additional cost.  
Contoured wedges available at additional cost per wedge or per pair.

## 5.10 High Temperature WREN TOFD Wedges – Stainless Steel

Ideal for use with the WREN Scanner and DTOF transducers. The wedge is designed to withstand 200°C, however the temperature limit of the transducer must be considered. Includes irrigation and gimbal pin options.

■ Contoured wedges available on request

Product Code	Beam Angle	Thread Size	W x L (mm) (Contact face)	Wedge Delay		Emission Point
				mm	µs	
WRENSSI HT 12/45	45°	M12	30 x 8.5	10.3	4.20	4
WRENSSI HT 12/60	60°		30 x 9	10.0	4.08	
WRENSSI HT 12/70	70°			9.8	4.00	

Non-standard wedge angles available at additional cost.

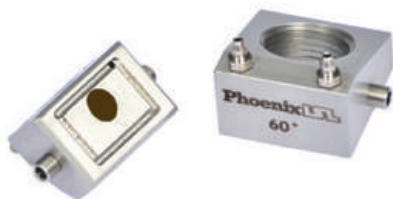
Contoured wedges available at additional cost per wedge or per pair.

Wedge delay times measured at 20°C.

## 5.11 High Temperature TOFD Wedges – Stainless Steel

Can be used with the full range of Phoenix ISL scanners and DTOF transducers. The material used in this wedge is designed to withstand 200°C, however the temperature limit of the transducer must be considered. Includes irrigation and gimbal pin options.

■ Contoured wedges available on request



High Temp TOFD Wedges -  
Stainless Steel

Product Code	Beam Angle	Thread Size	W x L (mm) (Contact face)	Wedge Delay		Emission Point
				mm	µs	
WTOFSSI HT 12/45	45°	M12	30 x 20	7.1	2.90	8
WTOFSSI HT 12/60	60°			7.0	2.86	
WTOFSSI HT 12/70	70°			8.1	3.31	
WTOFSSI HT 20/45	45°	M20	30 x 30	7.5	3.06	13
WTOFSSI HT 20/60	60°					
WTOFSSI HT 20/70	70°					

Non-standard wedge angles available at additional cost.

Contoured wedges available at additional cost per wedge or per pair.

Wedge delay times measured at 20°C.

## 5.12 M-Skip Probes and Wedges

Multi-Skip or M-Skip probes and wedges offer an ultrasonic solution for corrosion detection of typically difficult to access areas of pipelines; around obstructions such as pipe supports, clamps and saddles.

M-Skip is an ultrasonic 'transmit-receive' method that locates probes and wedges either side of an obstruction. Ultrasound is transmitted through the wall of a pipeline or inspection surface, beneath the external obstruction and is received on the far side. The ultrasonic waves 'skip' between the internal and external surfaces and the arrival times of the signals are used to calculate wall thickness. Corrosion is detected through loss of signal amplitude, reduced signal arrival times and changes to signal shape.

■ *Wedges can be contoured, at an additional charge, to suit any surface profile. State diameter and direction when ordering.*



M-Skip Wedge



M-Skip Wedge with M20F Search Probe & M12 Couplant Probe



M-Skip Wedges with CDTOF Probes

Product Code	Velocity (m/sec)	Beam Angle	Beam Angle	Beam Type	Couplant Probe Thread Size	Search Probe Thread Size	Probe Size L x W x H (mm)
MSKIP-W-12-20-45	2330	45°	M12	SW	M12	M20	45 x 25 x 30
MSKIP-W-12-20-60		60°					
MSKIP-W-12-20-70		70°					

*Non-standard wedge angles available at additional cost.*

*Contoured wedges available at additional cost per wedge or per pair.*

### M-Skip Compatible Probes

For M-Skip compatible probes please see Section 5.1 De-mountable Piezo-composite TOFD Transducers (CDTOF code probes) on page 28.

- Probe dimensions supplied exclude connectors, gimbal pins and couplant nozzles
- Probe diameter measurements are to the widest point
- Contouring available per probe (please specify relative to beam direction)
- Please refer to Section 9.4 for transducer certificate and document options
- Technical datasheets available free of charge upon request, for certain transducers across the range
- Conditions of sale are available upon request
- Certificate of Conformity supplied free of charge with all probes

**For further information on TOFD Transducers and Wedges or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** sales@phoenixisl.com

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



# Phased Array Transducers and Wedges

6.1 Linear Phased Array Probe Range

High performance linear phased array probes, available to order from stock in a range of 5MHz - 7.5MHz and from 16 to 64 elements. Designed with piezo-composite elements, Phoenix ISL phased array probes provide high resolution imaging to maximise sensitivity, accurate ultrasonic detection and sizing of defects in welds and effective corrosion mapping of various materials. Housed in a rugged stainless steel case for all industrial NDT applications. Compatible with market leading instruments and the Phoenix ISL range of phased array wedges.

Supplied with:

- Integral cable and IPEX connector\*
- Array Characterisation Report
- Carry Case



PA-W20-5L16 Probe



PA-W70-5L60 Probe

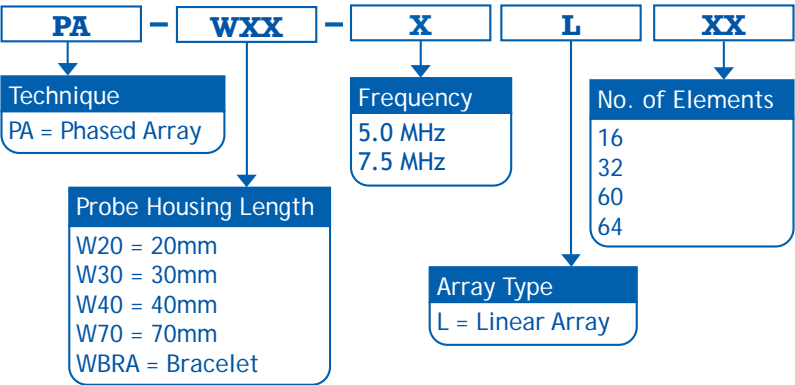


PA-WBRA-7.5L16 Probe

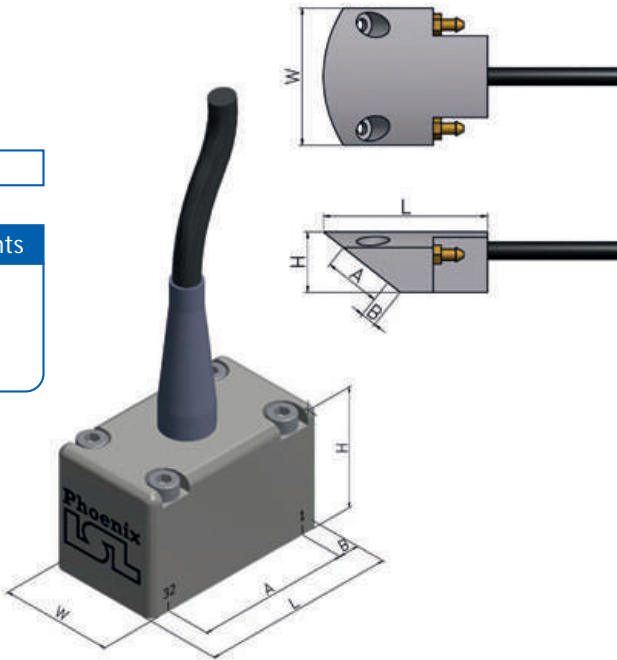
Product Code	Frequency MHz	No. of Elements	Pitch	Aperture		Elevation (mm)	External Dimensions		
				A (mm)	B (mm)		Length L (mm)	Width W (mm)	Height H (mm)
PA-W20-5L16	5.0	16	0.60	9.6	5.5	10	20	23	25
PA-W30-5L32	5.0	32	0.60	19.2	5.7	10	30	23	25
PA-W40-5L32	5.0	32	1.00	32.0	4.5	10	40	23	25
PA-W40-5L64	5.0	64	0.50	32.0	4.25	10	40	23	25
PA-W70-5L60	5.0	60	1.00	60.0	5.5	10	70	23	25
PA-WBRA-7.5L16	7.5	16	0.50	8.0	2.5	10	25.9	21.9	9.7

- The above phased array probes are available to order from stock
- Other specification phased array probes available on request
- \*Other connector types available to order, upon request

Phased Array Probe Product Codes



Note: Not all combinations are available from stock.





## 6.2 Phased Array Wedges

Phoenix ISL phased array wedges are manufactured from rexolite® and available to order in a range of different angles. All wedges can be contoured to your specification. Suitable for use with Phoenix ISL linear phased array probes.

Wedges include:

- Irrigation
- Mounting holes
- Wear pins - to increase wear resistance

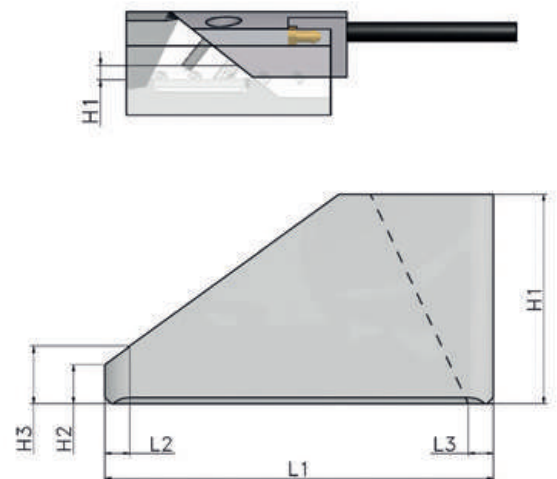
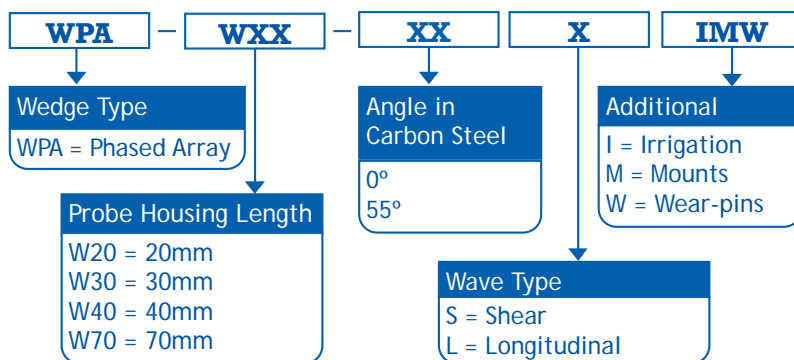


Range of Phased Array Wedges

Product Code	Velocity (m/s)	Front Height H1 (mm)	Rear Height H2 (mm)	Height to El.1 H3 (mm)	Length L1 (mm)	Length to El.1 L2 (mm)	Length to Damping L3 (mm)	Width (mm)	Wedge Angle (°)	Wave Type	Angle in C/Steel (°)
WPA-W20-55S-IMW	2330	15.50	3.62	7.0	25.0	4.7	4.0	40.0	36.1	Shear	55
WPA-W30-55S-IMW	2330	32.00	11.33	16.0	49.0	6.4	4.0	40.0	36.1	Shear	55
WPA-W40-55S-IMW	2330	33.50	6.27	11.0	62.0	6.4	4.0	40.0	36.1	Shear	55
WPA-W70-55S-IMW	2330	47.50	4.18	8.2	82.0	5.5	4.0	40.0	36.1	Shear	55
WPA-W20-0L-IMW	2330	20.00	20.00	20.00	25.0	8.0	--	40.0	0	Long	0
WPA-W30-0L-IMW	2330	20.00	20.00	20.00	49.0	15.2	--	40.0	0	Long	0
WPA-W40-0L-IMW	2330	20.00	20.00	20.00	62.0	15.5	--	40.0	0	Long	0
WPA-W70-0L-IMW	2330	20.00	20.00	20.00	82.0	11.5	--	40.0	0	Long	0
PA-WBRA-60S-IM	2330	13.00	13.00	4.8	30.00	13.6	3.0	30.0	38.5	Shear	60

- Other specification phased array wedges available on request. See product code generator below.
- Wedges can be contoured to suit any surface profile - Diameter and direction must be stated on order.
- Contoured Wedges available at additional cost.

### Phased Array Wedge Product Codes



- 
- Probe dimensions supplied exclude connectors, gimbal pins and couplant nozzles
  - Probe diameter measurements are to the widest point
  - Contouring available per wedge (please specify relative to beam direction)

- Conditions of sale are available upon request
- Array Characterisation Report supplied free of charge with all phased array probes

---

**For further information on Phased Array Transducers or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*

The background image shows several cylindrical metal transducers. The central one is upright and has a black top cap with white text: "Phoenix", "SSTC 4/10", "4 MHz 10 mm", and "40434". To its left, another similar transducer is partially visible with text "Phoenix", "SSTC 4/10", "4 MHz 10 mm", and "20660". To the right, a smaller transducer is visible with text "SSTC 10/6", "10 MHz 6 mm", and "30931". At the bottom, a transducer lies horizontally with text "Phoenix", "SSTC 4/6", "4 MHz 6 mm", and "27621". A large, bold, blue "OTV" is superimposed over the center of the image.

# OTV

## Corrosion Mapping Transducers and Accessories

## Corrosion Mapping Transducers and Accessories

Corrosion mapping identifies and maps variations in material thickness due to corrosion. Results for corrosion mapping provide a high degree of repeatability and the advantage of position and size data for every flaw. This can be compared for repeat scans of the same area to track flaw growth or corrosion rates both generally and for individual pits.

The Phoenix range of standard and high temperature corrosion mapping transducers complement the compression wave probe range and are compatible with Phoenix automatic or semi-automatic scanners. They are housed in a durable steel case with side entry connections. The range is popular as stand-alone transducers for manual inspections or to enable fitting a detachable Light Emitting Diode on top of the transducer which can be utilised with various manufacturers video tracking systems.

### 7.1 Twin Crystal Compression Wave Transducers

The SSTC range are housed in a durable steel case with side entry connections, which enable the fitting of a detachable tracking facility.



SSTC 4/10 Probe



SSTC 4/6 Probe

Product Code	Frequency MHz	Twin Crystal Dia (mm)	Nominal Focus	Probe Size Dia x H (mm)	Connector
SSTC 2/20	2	20	28	31 x 41	Lemo 00
SSTC 2.5/10	2.5	10	12	20 x 33	
SSTC 4/6	4	6	8	12 x 24	Subvis
SSTC 4/10		10	12	20 x 33	Lemo 00
SSTC 4/20		20	28	31 x 41	
SSTC 5/10	5	10	12	20 x 33	
SSTC 5/20		20	28	31 x 41	
SSTC 10/6 12mm Ø case	10	6	3	12 x 25	Subvis
SSTC 10/6 20mm Ø case				20 x 33	Lemo 00

## 7.2 High Temperature Twin Crystal Compression Wave Transducers

The SSHTC range are housed in a durable steel case with side entry connections, which enable the fitting of a detachable tracking facility. Recommended temperature rating:

- Continuously at 120°C
- Intermittently at 200°C i.e. 10 sec contact with 1 minute air cooling



SSHTC 4/10 Probe

Product Code	Frequency MHz	Crystal Dia (mm)	Nominal Focus	Probe Size Dia x H (mm)	Connector
SSHTC 1/20	1	20	28	31 x 41	Lemo 00
SSHTC 2/20	2				
SSHTC 2.5/10	2.5	10	12	20 x 33	Subvis
SSHTC 4/6	4	6	8	12 x 25	
SSHTC 4/10		10	12	20 x 33	Lemo 00
SSHTC 4/20		20	28	31 x 41	
SSHTC 5/10	5	10	12	20 x 33	
SSHTC 5/20		20	28	31 x 41	

## 7.3 IR Emitters

Phoenix offer a range of infrared emitters that can be fitted temporarily or permanently to the range of corrosion mapping probes. These emitters when used in conjunction with a C-Scan system enable accurate corrosion maps to be generated whilst still scanning the work piece manually.

- Supplied as standard with Lemo 00 connectors



IR Emitter 6mm



IR Emitter 10mm



IR Emitter 20mm

Product Code	Description
DEM-6 Push On	Infrared emitter for 6mm range. Push fit onto 10mm dia probe. 2m cable
DEM-6 Glue On	Infrared emitter to glue on any probe
DEM-10 Push On	Infrared emitter for 10mm range. Push fit onto 10-18mm dia probes. 2m cable
DEM-20 Push On	Infrared emitter for 20mm range. Push fit onto 29mm dia probe max. 2m cable
Permanent	For fitting to SSTC 4/10 Probe 2m cable



- 
- Probe dimensions supplied exclude connectors, gimbal pins and couplant nozzles
  - Probe diameter measurements are to the widest point
  - Contouring available per probe (please specify relative to beam direction)
  - Please refer to Section 9.4 for transducer certificate and document options

- Technical datasheets available free of charge upon request, for certain transducers across the range
- Conditions of sale are available upon request
- Certificate of Conformity supplied free of charge with all probes

---

**For further information on Corrosion Mapping Transducers or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



# 081

## Calibration Blocks

PISL PHASED ARRAY  
TEST BLOCK  
12/17/05

11/28/26

2/49/39

40° 50° 60° 65°

65° 70° 75°

## 8.1 Calibration Blocks





All calibration blocks are engraved with a unique serial number and certified to the applicable standard. All blocks are supplied with a calibration certificate.

### Quality Assurance

- Each block is engraved with a unique serial number and fully certified to the applicable standard
- Material reports are available but must be requested at the point of ordering
- A full independent NAMAS/UKAS approval for physical measurements is offered, if required (price on application)

Product Code	Material & Size (mm)	Description	Specification
 BLOCK-NO1-CS BLOCK-NO1-SS BLOCK-NO1-AL	25 x 100 x 300 (weight 6.2kgs)  Carbon Steel Stainless Steel Aluminium	<b>BLOCK NO 1</b> Calibration standard for the calibration of shear and compression wave probes, time base and sensitivity settings, verification of beam angle, emission point, resolution. Includes case. <b>3mm Ø target hole.</b> (Stainless Steel and Aluminium conform dimensionally to EN ISO 2400:2012).	EN ISO 2400 2012
 BLOCK-NO1-50MM	50 x 100 x 300 (weight 9.6kgs)  Carbon Steel	<b>BLOCK NO 1 50mm THICK</b> Calibration standard for the calibration of shear and compression wave probes, time base and sensitivity settings, verification of beam angle, emission point, resolution. Includes case. <b>3mm Ø target hole.</b>	EN ISO 2400 2012
 V1(A2)-CAL-BLOCK-CS V1(A2)-CAL-BLOCK-SS V1(A2)-CAL-BLOCK-AL	25 x 100 x 300 (weight 6.2kgs)  Carbon Steel Stainless Steel Aluminium	<b>V1 (A2)</b> V1 (A2) Calibration standard for the calibration of shear and compression wave probes, time base and sensitivity settings, verification of beam angle, emission point, resolution. Includes case. <b>1.5mm Ø target hole.</b> (Compliant with EN ISO 2400:2012).	BS2704
 V1(A2)-CAL-BLOCK-50MM	50 x 100 x 300 (weight 9.6kgs)  Carbon Steel	<b>V1 (A2) 50mm THICK</b> V1 (A2) Calibration standard for the calibration of shear and compression wave probes, time base and sensitivity settings, verification of beam angle, emission point, resolution. Includes case. <b>1.5mm Ø target hole.</b> (Compliant with EN ISO 2400:2012).	BS2704
 BLOCK-N02-CS BLOCK-N02-SS BLOCK-N02-AL	12.5 Thick  Carbon Steel Stainless Steel Aluminium	<b>BLOCK NO 2</b> Miniature calibration block for site checking of shear wave probes, verification of beam angles, calibration of time base and sensitivity settings with <b>5mm Ø target hole.</b> Includes case. (Stainless Steel and Aluminium conform dimensionally to EN ISO 7963:2010).	EN ISO 7963 2010
 V2/12.5(A4)-CAL-BLOCK-CS V2/12.5(A4)-CAL-BLOCK-SS V2/12.5(A4)-CAL-BLOCK-AL	12.5 Thick  Carbon Steel Stainless Steel Aluminium	<b>V2/12.5 (A4)</b> V2/12.5 (A4) Miniature calibration block for site checking of shear wave probes, verification of beam angles, calibration of time base and sensitivity settings with <b>1.5mm Ø target hole.</b> Includes case. (Compliant with EN ISO 7963:2010).	BS2704

Product Code	Material & Size (mm)	Description	Specification
 BLOCK-NO2-2-20MM-CS BLOCK-NO2-2-20MM-SS BLOCK-NO2-2-20MM-AL	20mm Thick  Carbon Steel Stainless Steel Aluminium	<b>BLOCK NO 2 20mm THICK</b> 20mm Thick miniature calibration block with 5mm Ø target hole. For site checking of shear wave probes, verification of beam angles, calibration of time base and sensitivity settings. The thicker 20mm block reduces side wall echoes. Includes case. (Stainless Steel and Aluminium conform dimensionally to EN ISO 7963:2010).	EN ISO 7963 2010
 V2/20(A4)-CAL-BLOCK-20MM-CS V2/20(A4)-CAL-BLOCK-20MM-SS V2/20(A4)-CAL-BLOCK-20MM-AL	20mm Thick  Carbon Steel Stainless Steel Aluminium	<b>V2/20 (A4)</b> 20mm Thick miniature calibration block with 1.5mm Ø target hole. For site checking of shear wave probes, verification of beam angles, calibration of time base and sensitivity settings. The thicker 20mm block reduces side wall echoes. Includes case. (Compliant with EN ISO 7963:2010).	BS2704
 BCB-IOW-(A5)	50 x 75 x 305	<b>BCB IOW (A5)</b> Beam calibration block for beam profile measurement and resolution checks for shear wave probes, also sensitivity levels for shear and compression wave probes. Includes case. 9 x 1.5mm Ø target holes.	BS2704
 A6-CAL-BLOCK	25 x 50 x 150	<b>A6</b> For checking the dominant frequency of compression wave probes, the pulse length dead zone and resolving power for both shear and compression wave probes as per BS4331 Part 3 1974. (1987). (1.5kg)	BS2704
 A7(RTB)-CAL-BLOCK	74 radius x 75 thick	<b>A7 (RTB)</b> Resolution Block for checking shear wave probe resolution as per BS4331 Part 3 1974. 4 steps at 2, 3, 4 and 5mm. (4kg)	-
 BTB-CAL-BLOCK	25 x 20 x 165 (0.6kg)	<b>BTB</b> Contoured Boiler Tube Calibration Block (BTB) - For calibrating low profile PA probes. For use with Bracelet scanner. 3 x 1.5mm dia SDH. Contoured for 1.9" OD (1.5" NPS) (other contours available incl. 2" / 2.5" / 3" / 3.5" / 4" NPS).	
 BTB-CAL-BLOCK-5X1.5MM	25 x 20 x 165 (0.6kg)	<b>BTB</b> BTB as above with 5 x 1.5mm dia SDH	
 BTB-CAL-BLOCK-5X1.5MM	25 x 20 x 165 (0.6kg)	<b>BTB</b> BTB as above with 5 x 1mm dia SDH	

Product Code	Material & Size (mm)	Description	Specification
 R-CB87	-	<b>Rail Block CB87</b> Calibration block for the Rail industry. Includes certificate and wallet.	-
 R-CB86	-	<b>Rail Block CB91</b> Calibration block for the Rail industry. Includes certificate.	-
 PA-CAL-BLOCK	375mm L	<b>Flat Phased Array Test Block</b> Flat phased array calibration block for calibrating TCG, sensitivity, velocity and wedge delay. (5.6kg)  <b>3 x 1.5mm SDH</b>	-
 PA-CALBLOCK-CONT	-	<b>Contoured Phased Array Test Block</b> Contoured phased array calibration block for calibrating TCG, sensitivity, velocity and wedge delay. Contour to be advised by customer.  <b>3 x 1.5mm SDH</b>	-



## 8.2 Step Wedges

Step Wedges are not covered by any EN standard, however Phoenix step wedges are manufactured to Material Specification of BSEN 12223:2000 and each step wedge is engraved with a unique serial number.

Product Code	Description	Material
 STEP-WEDGE-1.8-CS STEP-WEDGE-1.8-AL STEP-WEDGE-1.8-SS	LSW 1-8mm Carbon Steel  8 steps from 1mm to 8mm Pad size: 15mm Includes case	Carbon Steel Aluminium Stainless Steel
 STEP-WEDGE-4-20-CS STEP-WEDGE-4-20-SS STEP-WEDGE-4-20-AL	LSW 4-20  4 steps at 5, 10, 15, 20mm Pad size: 20mm	Carbon Steel Stainless Steel Aluminium
 STEP-WEDGE-4-25-CS STEP-WEDGE-4-25-SS	LSW 4-25  4 steps at 5, 10, 15, 20mm Pad size: 25mm	Carbon Steel Stainless Steel
 STEP-WEDGE-1-10-CS STEP-WEDGE-1-10-SS	LSW 1-10  10 steps at 1mm Pad size: 15mm	Carbon Steel Stainless Steel
 STEP-WEDGE-2-20-CS	LSW 2-20  10 steps at 2mm Pad size: 20mm	Carbon Steel
 STEP-WEDGE-5-25-CS STEP-WEDGE-5-25-SS STEP-WEDGE-5-25-AL	LSW 5-25  5 steps at 5, 10, 15, 20, 25mm Pad size: 20mm	Carbon Steel Stainless Steel Aluminium
 STEP-WEDGE-1.5-20-P	LSW 1.5- 20 Perspex holder  6 steps at 1.5, 2.5, 5, 10, 15, 20mm Inserts: 25mm diameter	Mild Steel
 STEP-WEDGE-CSW	CSW - Curved Step Wedge  5 steps at 2, 4, 6, 8, 10mm for time base calibration of thickness measuring probes	Carbon Steel

Note: Rugged fabric carry cases are included where indicated.

#### Quality Assurance

- A full independent NAMAS/UKAS approval for physical measurements is offered, if required (price on application)
- Material reports also available on request

---

**For further information on Calibration Blocks or to place an order, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



09

**Accessories**

## Accessories

In addition to transducers Phoenix offer a comprehensive range of accessories to complement their use.

### 9.1 Cables – 2m Long

Phoenix standard cables are 2m in length. Extra length cables are available to order, please contact the sales team to discuss your specific requirement.



#### Single Probe Cable – PC 2 metre

Product Code	Instrument	Transducer
PCL1-S	Lemo 1	Subvis
PCL1-L00		Lemo 00
PCL1-M		Microdot
PCL1-BNC		BNC
PCL1-L1		Lemo 1
PCBNC-S	BNC	Subvis
PCBNC-L00		Lemo 00
PCBNC-M		Microdot
PCBNC-BNC		BNC
PCL00-L00	Lemo 00	Lemo 00
PCL00-S		Subvis
PCL00-M		Microdot
PCL00-MCX		MCX
PCL00-MCX		MCX (right angle)
PCL00-MRA		Microdot (right angle)
PCL1-MRA	Lemo 1	Microdot (right angle)
PCBNC-MRA	BNC	Microdot (right angle)
PCL1-UHF	Lemo 1	UHF (Waterproof)
PCBNC-UHF	BNC	UHF (Waterproof)

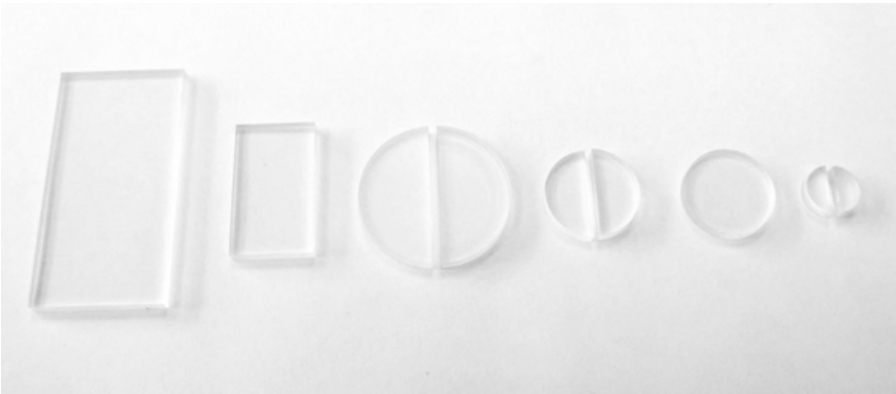
Extra Length Cables available at additional charge per metre.

#### Twin Probe Cable – TPC 2 metre

Product Code	Instrument	Transducer
TPCL1-S	Lemo 1	Subvis
TPCL1-L00		Lemo 00
TPCL1-M		Microdot
TPCL1-BNC		BNC
TPCL1-L1		Lemo 1
TPCBNC-S	BNC	Subvis
TPCBNC-L00		Lemo 00
TPCBNC-M		Microdot
TPCBNC-BNC		BNC
TPCL00-L00	Lemo 00	Lemo 00
TPCL00-S		Subvis
TPCL00-M		Microdot
TPCL00-MCX		MCX
TPCL00-MCX		MCX (right angle)
TPCL00-MRA		Microdot (right angle)
TPCL1-MRA	Lemo 1	Microdot (right angle)
TPCBNC-MRA	BNC	Microdot (right angle)

Extra Length Cables available at additional charge per metre.

9.2 Re-Shoe Kits



Re-Shoe Kits

Product Code	Description
REP-SSW/GSW	SSW/GSW Single Angle (10 Shoes)
REP-LSW	LSW Single Angle (10 Shoes)
REP-TSW	TSW Twin Angles (10 pairs)*
REP-TC10	TC 10 (10 pairs)*
REP-TC20	TC 20 (10 pairs)*
REP-TC5	TC 5/5 (10 pairs)*

Please note adhesive is not supplied with re-shoe kits.  
\* Acoustic barrier included.

9.3 Adaptors

Adaptor options are available to order and can be supplied as any combination of plugs and sockets on short 100mm tails of required cable.



BNC (M) to Lemo 1 (F)



Lemo 1 (M) to BNC (F)

Product Code	Adaptor Description
ADAPTOR-BNC/L1	Adapts instrument with BNC (M) to Lemo 1 (F) cable
ADAPTOR-L1/BNC	Adapts instrument with Lemo 1 (M) to BNC (F) cable

M = Male  
F = Female



9.4 Certificates and Documents

Certificates and documents are optional and can be supplied with all transducers (please request at point of ordering).



Certificates

Product Code	Certification Options
C-OF-C	Certification of Conformity (per transducer)
CERT-IP	Certificate (individual parameters of the specific transducer recorded)
CERT-BSEN	Full BS EN ISO 22232-2:2020 Part 2 documentation package
CERT-UK	UK Certificate of Origin (per order)

For further information about Probe Accessories and Certificates, contact the sales team:

t: +44 (0) 1925 826000 | e: sales@phoenixisl.com

Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12



# 10/

## Custom-Design Transducers

---

**For further information about Custom-Design Transducers, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*

# Custom-Design Transducers

## Can't find what you are looking for?...

Phoenix ISL's custom and application specific transducers are an alternative to our standard transducer ranges.

At Phoenix Inspection Systems Ltd, we like a challenge and can take on your particular ultrasonic transducer problems and deliver a reliable and repeatable solution.

### Modified standard or full custom?

Often we can make a small modification to one of our standard range to deliver a very economical solution based on proven technology. If nothing in the standard range comes close, we can look at a fully customised transducer to suit your application.

So where do we start? First you need to have a problem to solve. It's best if you know the specification of the transducer that you are looking for, but talk to us early as a custom transducer may help in the design of the inspection procedure, and reduce overall costs. If you need help specifying the transducer, we can assist you if you let us know your inspection requirements.

### Inspection Standards and Codes

Phoenix ISL transducers are verified in accordance with quality standard BS EN ISO 22232-2:2020.

Some companies or countries have specific procedures or standards which specify an obsolete transducer or a transducer which is simply unavailable. Please contact us to discuss your particular specification as we are usually able to build a transducer which will match or exceed the required performance criteria.

### Technique Development

We are frequently asked to help with novel technique development. This can require a significant deviation from accepted practices and require novel ways of thinking about an ultrasonic problem. Aerospace composites, wind turbine, marine, cable, rail, nuclear, subsea and power plants are all areas where we have provided solutions to customers that go beyond simply supplying transducers.

### Harsh Environments

Our transducers end up in the most surprising of places, from the ocean bed (depths down to 4km), to high radiation environments. We also manufacture transducers for elevated temperatures. Often, it's the coupling rather than the transducer which limits the inspection parameters. The particularities of nuclear plants severely restrict the materials that can contact the metal.

We have expert knowledge of what's currently acceptable and work with various laboratories to acquire certifications of chemical composition.

### Phased Array

In addition to our standard range of phased array probes, we also offer custom-design solutions. Often the transducer is just the starting point with the wedge performing the difficult functions of coupling, contouring and minimising internal reflections.

**To discuss your custom-design transducer requirements contact the sales team on:**

**t: +44 (0) 1925 826 000**

**e: [sales@phoenixisl.com](mailto:sales@phoenixisl.com)**



Multi-Element Probes



Train Scanner Probe



SubSea Shear Wave Probe



Bore Probe

---

**For further information about Custom-Design Transducers, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



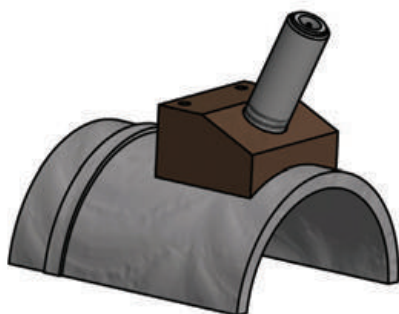


11/

**Useful  
Information**

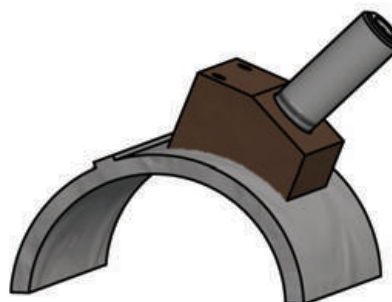
## 11.1 Contouring Conventions

Transducer and Wedge contouring is available. Please specify one of the four options illustrated below, at the time of ordering.



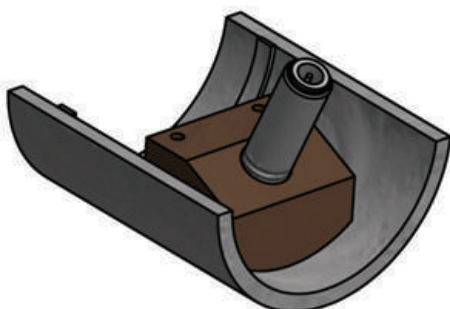
**AOD**

Axial Outside Diameter



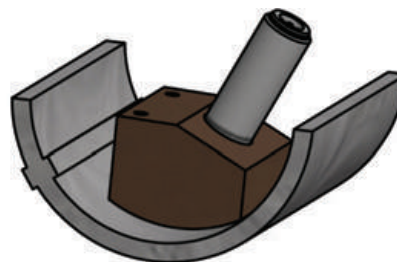
**COD**

Circumferential Outside Diameter



**AID**

Axial Inside Diameter



**CID**

Circumferential Inside Diameter

---

**For further information and technical advice about transducers and wedges, contact the sales team:**

**t:** +44 (0) 1925 826000 | **e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

*Phoenix Inspection Systems Limited has a policy of continuous development therefore products featured are subject to change. Issued: Oct 2021/Rev 12*



## Contact Us

Phoenix Inspection Systems Limited

Dalton House, 40 Hardwick Grange,  
Warrington, WA1 4RF, United Kingdom

**t:** +44 (0) 1925 826 000

**f:** +44 (0) 1925 838 788

**e:** [sales@phoenixisl.com](mailto:sales@phoenixisl.com)

**[www.phoenixisl.com](http://www.phoenixisl.com)**

