



Ultrasonic transducers



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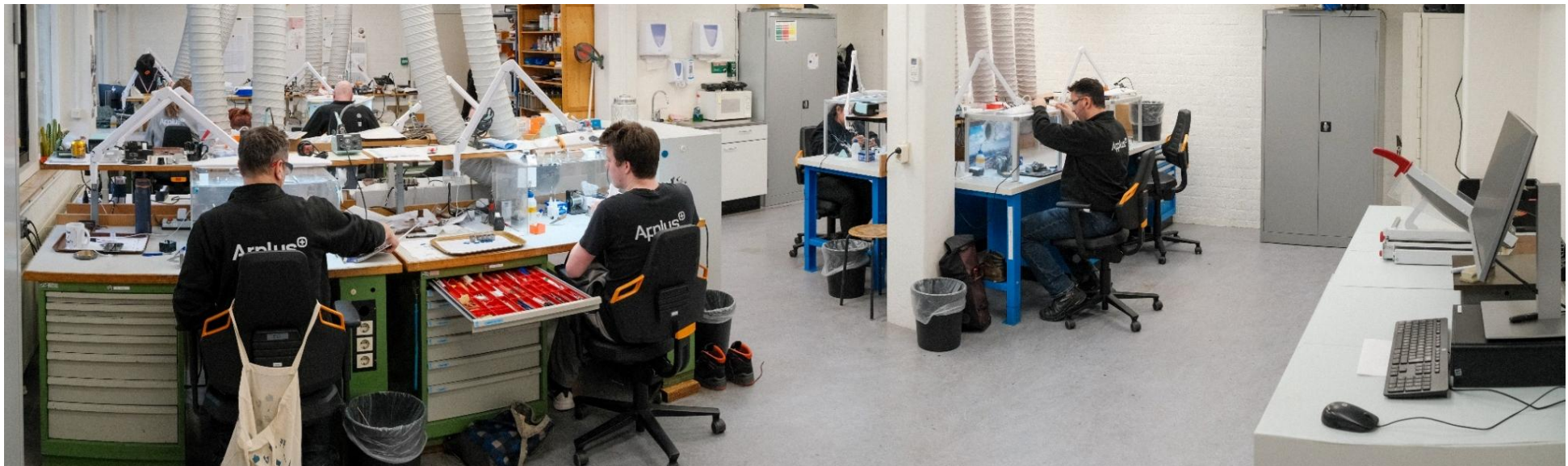
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Built for inspection performance

Applus+ designs and manufactures ultrasonic transducers, wedges, cables and accessories for a wide range of Non-Destructive Testing (NDT) applications. Our portfolio includes conventional, Phased Array and customised ultrasonic transducers, developed to deliver reliable results in demanding industrial environments. Manufactured to tried-and-tested quality standards, our solutions are built for accuracy, durability and repeatable results. We also design custom ultrasonic transducers to match specific inspection methods, materials and operating conditions.

- Conventional and custom ultrasonic transducers
- Options for harsh environments, including high-temperature and deep-water
- Fast, practical technical support from experienced NDT specialists

With a strong focus on engineering quality, application knowledge and responsive service, Applus+ supports inspection teams worldwide with reliable ultrasonic transducer technology that improves NDT inspection quality and operational confidence.



Why choose Applus+

Applus+ combines engineering expertise, manufacturing capability and practical field knowledge to deliver ultrasonic transducer solutions that perform where reliability matters most. We work closely with you to match the right ultrasonic transducer design to the NDT inspection method, operating conditions and performance requirements.

We are recognised for our expertise in creating customised ultrasonic transducers, leveraging significant experience with international customers to deliver solutions suitable for a wide variety of applications. Committed to innovative ultrasonic transducer designs, our team supports various or different NDT inspection needs through high-quality engineering.

Applus+ benefits:

- Global technical support backed by industry expertise
- Rapid delivery from stock
- Competitive lead times for customised orders
- Attractive pricing
- ISO 9001:2015 certified

Conventional ultrasonic transducers

Because you need proven and reliable solutions for daily inspection routines

Whether the requirement is flaw detection, thickness measurement, or material characterisation, Applus+ conventional ultrasonic transducers deliver reliable outcomes and are supported by our expert technical team. With readily available models and prompt delivery, Applus+ conventional ultrasonic transducers offer a practical and cost-efficient solution for daily Non-Destructive Testing (NDT) challenges.



Ultrasonic straight beam single element transducers

Our conventional ultrasonic straight beam single element transducer range supports straightforward, reliable NDT inspection for flaw detection, thickness measurement and general material characterisation. Available in multiple configurations, they are designed for practical use in industrial environments where consistency and ease of application are essential.

Key features:

- Durable wear plate for extended service life
- Excellent acoustic impedance match to metals
- Suitable for rugged industrial environments

Applications:

- Flaw detection
- Thickness gauging
- Material characterisation
- Inspection of plates, billets, bars, forgings, castings



Part number	Frequency (Mhz)	Wave type	Beam angle in carbon steel	Nominal element size		Focus in carbon steel (mm)	Connector type	Connector location	Illustration
				Inch	mm				
LSOL1 A001	1	Long	0°	(ø0,94) ¼L	(ø24)¼L	-	LEMO-1	Rear Center	1
LSOL2 A002	2	Long	0°	(ø0,94) ¼L	(ø24)¼L	-	LEMO-1	Rear Center	1
LSOL4 A003	4	Long	0°	(ø0,94) ¼L	(ø24)¼L	-	LEMO-1	Rear Center	1
SSOL2 A004	2	Long	0°	(ø0,39)¼L	(ø10)¼L	-	LEMO-00	Rear Center	2
SSOL4 A005	4	Long	0°	(ø0,39)¼L	(ø10)¼L	-	LEMO-00	Rear Center	2

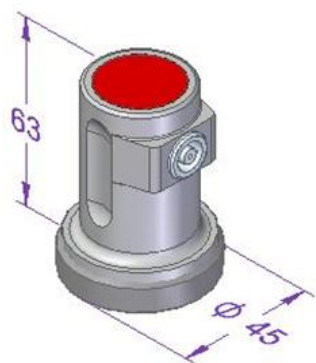


Illustration 1

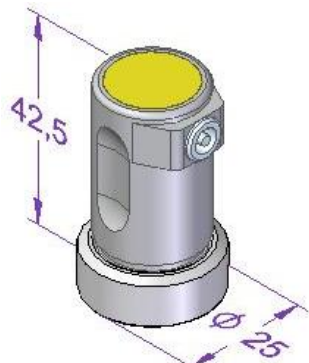


Illustration 2

Ultrasonic straight beam dual element transducers

Ultrasonic dual element transducers are ideal for corrosion monitoring, wall thickness measurement and NDT inspection of rough or challenging surfaces. Their design supports improved near-surface resolution and dependable readings in applications where reliable thickness data is critical.

Key features:

- Enhanced near-surface resolution
- Reliable readings on corroded or rough surfaces
- High-temperature capability

Applications:

- Wall thickness measurement
- Corrosion/erosion monitoring
- Weld overlay and cladding inspection
- Crack and inclusion detection in castings and forgings



Part number	Frequency Mhz)	Wave type	Beam angle in carbon steel	Nominal element size		Focus in carbon steel (mm)	Connector type	Connector location	Illustration
				Inch	mm				
SD0L10-3 A006	10	Long	0°	2(0.0200.20)¼L	2(½05)¼L	3	Microdot S&L	Rear	3
SD0L10-3 A007	10	Long	0°	2(0.0200.20)¼L	2(½05)¼L	3	Microdot	Rear	3
SD0L5-10 A008	5	Long	0°	2(0.0200.35)	2(½09)	10	LEMO-00	Rear Center	4
SD0L2-8 A009	2	Long	0°	2(0.0200.43)¼L	2(½011)¼L	8	LEMO-00	Rear Center	4
SD0L4-10 A010	4	Long	0°	2(0.14x0.39)¼L	2(3,5x10)¼L	10	LEMO-00	Rear Center	4
LD0L2-15 A011	2	Long	0°	2(0.28x0.71)¼L	2(7x18)¼L	15	LEMO-00	Rear	5
LD0L4-12 A012	4	Long	0°	2(0.24x0.79)¼L	2(6x20)¼L	12	LEMO-00	Rear	5

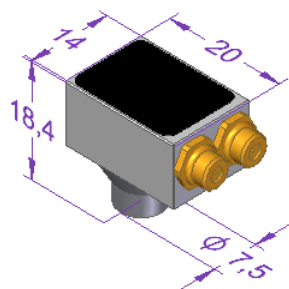


Illustration 3

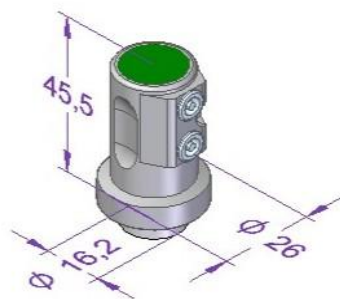


Illustration 4

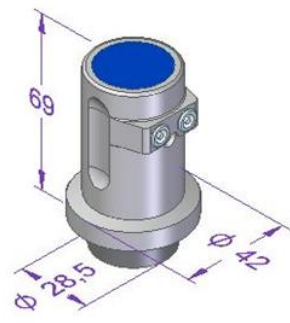


Illustration 5

Ultrasonic angle beam transducers

Ultrasonic angle beam transducers provide reliable access to weld zones and other difficult to inspect areas. Combined with the right wedge configuration, they support accurate flaw detection and evaluation in pipelines, structures and fabricated components.

Key features:

- Enables inspection of hard-to-access weld zones
- Available in standard refracted angles
- High-temperature capability

Applications:

- Weld inspection (flaw detection and sizing)
- Pipe and tube inspection
- Structural component evaluation



Part number	Frequency (Mhz)	Wave type	Beam angle in carbon steel)	Nominal element size		Focus in carbon steel (mm)	Connector type	Connector location	Illustration
				Inch	mm				
SS35T2 A013	2	Shear	35°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6
SS45T2 A015	2	Shear	45°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6
SS60T2 A016	2	Shear	60°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6
SS70T2 A017	2	Shear	70°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6
SS35T4 A014	4	Shear	35°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6
SS45T4 A018	4	Shear	45°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6
SS60T4 A019	4	Shear	60°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6
SS70T4 A020	4	Shear	70°	(0.35x0.31)¼L	(9x8)¼L	-	LEMO-00	Rear	6

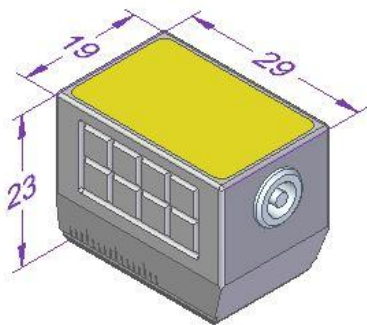


Illustration 6

Part number	Frequency (Mhz)	Wave type	Beam angle in carbon steel	Nominal element size		Focus in carbon steel (mm)	Connector type	Connector location	Illustration
				Inch	mm				
MS45T2 A021	2	Shear	45°	(0.55x0.55)¼L	(14x14)¼L	-	LEMO-00	Rear	7
MS60T2 A022	2	Shear	60°	(0.55x0.55)¼L	(14x14)¼L	-	LEMO-00	Rear	7
MS70T2 A023	2	Shear	70°	(0.55x0.55)¼L	(14x14)¼L	-	LEMO-00	Rear	7
MS45T4 A032	4	Shear	45°	(0.55x0.55)¼L	(14x14)¼L	-	LEMO-1	Rear	7
MS60T4 A033	4	Shear	60°	(0.55x0.55)¼L	(14x14)¼L	-	LEMO-1	Rear	7
MS70T4 A034	4	Shear	70°	(0.55x0.55)¼L	(14x14)¼L	-	LEMO-1	Rear	7

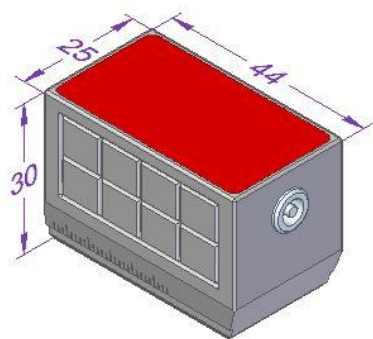


Illustration 7

Part number	Frequency (Mhz)	Wave type	Beam angle in carbon steel	Nominal element size		Focus in carbon steel (mm)	Connector type	Connector location	Illustration
LS35T2 A024	2	Shear	35°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8
LS45T2 A025	2	Shear	45°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8
LS60T2 A027	2	Shear	60°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8
LS70T2 A029	2	Shear	70°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8
LS35T4 A031	4	Shear	35°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8
LS45T4 A026	4	Shear	45°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8
LS60T4 A028	4	Shear	60°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8
LS70T4 A030	4	Shear	70°	(0.79x 0.79)¼L	(20x22)¼L	-	LEMO-1	Rear	8

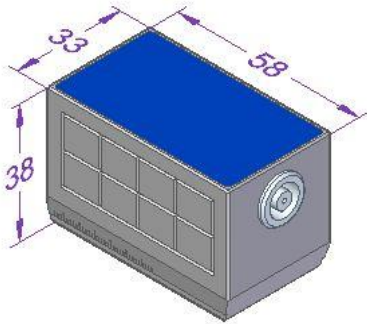


Illustration 8

Ultrasonic screw-in transducers and wedges

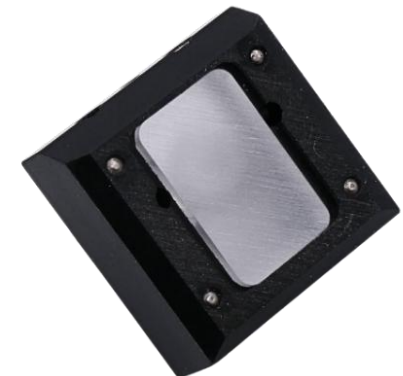
Ultrasonic screw-in transducer and wedge combinations offer flexibility for angle beam NDT inspections and are available in both standard and custom configurations. They are suitable for applications where fast interchangeability, robust setup and consistent acoustic performance are required.

Key features:

- Enables inspection of hard-to-access weld zones
- Available in conventional and custom refracted angles
- High-temperature wedge options

Applications:

-
- Weld inspection (flaw detection and sizing)
- Pipe and tube inspection
- Structural component evaluation



Ultrasonic ToFD transducers

Applus+ ultrasonic Time of Flight Diffraction (ToFD) transducers are designed for advanced weld inspection applications where accurate defect detection, depth positioning and through-wall sizing are essential. Used in a pitch-catch configuration with a transmitter and receiver probe on opposite sides of the weld or inspection zone, ToFD supports reliable detection of diffracted signals from defect tips and provides high-quality digital data for critical NDT assessments.

Key features:

- High accuracy for defect depth and height sizing
- Pitch-catch probe configuration for reliable diffracted signal detection
- Fast single-pass scanning with digital data recording

Applications:

- Weld inspection and defect sizing
- Fitness-for-service and structural integrity assessments
- Combined ToFD and Phased Array inspection setups



<i>Part number</i>	<i>Frequency (Mhz)</i>	<i>Wave type</i>	<i>Beam angle (in carbon steel)</i>	<i>Nominal element size</i>		<i>Focus in carbon steel (mm)</i>	<i>Connector type</i>	<i>Connector location</i>	<i>Illustration</i>
SS50L6 A135	6	Long	50°	ø0,24	ø6	-	LEMO-00	Top	9
SS55L6 A136	6	Long	55°	ø0,24	ø6	-	LEMO-00	Top	9
SS60L6 A137	6	Long	60°	ø0,24	ø6	-	LEMO-00	Top	9
SS65L6 A138	6	Long	65°	ø0,24	ø6	-	LEMO-00	Top	9
SS70L6 A139	6	Long	70°	ø0,24	ø6	-	LEMO-00	Top	9
SS50L10 A165	10	Long	50°	ø0,12	ø3	-	LEMO-00	Top	9
SS55L10 A166	10	Long	55°	ø0,12	ø3	-	LEMO-00	Top	9
SS60L10 A167	10	Long	60°	ø0,12	ø3	-	LEMO-00	Top	9
SS65L10 A168	10	Long	65°	ø0,12	ø3	-	LEMO-00	Top	9
SS70L10 A169	10	Long	70°	ø0,12	ø3	-	LEMO-00	Top	9

Part number	Frequency (Mhz)	Wave type	Beam angle in carbon steel	Nominal element size		Focus in carbon steel (mm)	Connector type	Connector location	Illustration
SS50L15 A180	15	Long	50°	ø0,12	ø3	-	LEMO-00	Top	9
SS55L15 A181	15	Long	55°	ø0,12	ø3	-	LEMO-00	Top	9
SS60L15 A182	15	Long	60°	ø0,12	ø3	-	LEMO-00	Top	9
SS65L15 A183	15	Long	65°	ø0,12	ø3	-	LEMO-00	Top	9
SS70L15 A184	15	Long	70°	ø0,12	ø3	-	LEMO-00	Top	9

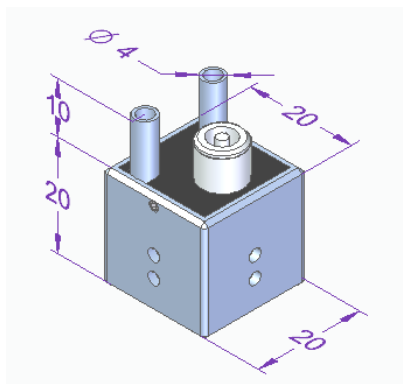


Illustration 9

Ultrasonic Phased Array transducers

Applus+ ultrasonic Phased Array (PA) solutions are designed for advanced inspections that require flexibility, precision and high-quality data. By supporting beam steering, multi-angle inspection and application-specific designs, our Phased Array transducer range helps inspection teams tackle complex welds, geometries and critical assets with greater confidence.

Key features:

- Electronic Beam Steering & Focusing
- Superior Defect Characterization
- Complex Geometry Capability

Applications:

- Weld inspection (flaw detection and sizing)
- Corrosion / erosion monitoring
- Complex NDT inspection

Ultrasonic Phased Array wedges

The correct combination of ultrasonic Phased Array transducer and wedge is essential for a reliable NDT inspection set-up. Applus+ wedges are designed for compatibility with our own ultrasonic Phased Array transducers and can also be matched to commonly used ultrasonic PA transducers from other manufacturers



Part number	Probe type	Wave type	Beam angle in carbon steel	Lens focusing	Wedge Dimensions (mm)			Material	Curvature	Illustration
					Length	Width	Height			
W010-A10-OL	A10	Long	0°	-	25	23	20	Rexolite	On request	10
W010-A10-OL-IHC	A10	Long	0°	-	25	40	20	Rexolite	On request	11
W010-A10-55S	A10	Shear	55°	-	25	23	20	Rexolite	On request	10
W010-A10-55S-IHC	A10	Shear	55°	-	25	40	14	Rexolite	On request	11
W010-A10-60L	A10	Long	60°	-	25	23	30	Rexolite	On request	10
W010-A10-60L-IHC	A10	Long	60°	-	25	40	30	Rexolite	On request	11
W012-A12-OL	A12	Long	0°	-	58	23	20	Rexolite	On request	10
W012-A12-OL-IHC	A12	Long	0°	-	58	40	20	Rexolite	On request	11
W012-A12-55S	A12	Shear	55°	-	73	23	45	Rexolite	On request	10
W012-A12-55S-IHC	A12	Shear	55°	-	73	40	45	Rexolite	On request	11
W012-A12-60L	A12	Long	60°	-	61	23	53	Rexolite	On request	10
W012-A12-60L-IHC	A12	Long	60°	-	61	40	53	Rexolite	On request	11
W015-A15-60S	A15	Shear	60°	-	18	22	15.5	Rexolite	On request	10
W015-A15-60L	A15	Long	60°	-	18	22	12.75	Rexolite	On request	10
W031-A31-OL	A31	Long	0°	-	40	30	20	Rexolite	On request	10
W031-A31-OL-IHC	A31	Long	0°	-	40	40	20	Rexolite	On request	11
W031-A31-55S	A31	Shear	55°	-	49	30	32	Rexolite	On request	10
W031-A31-55S-IHC	A31	Shear	55°	-	49	40	32	Rexolite	On request	11
W031-A31-60L	A31	Long	60°	-	39	30	31	Rexolite	On request	10

Part number	Probe type	Wave type	Beam angle in carbon steel	Lens focusing	Wedge Dimensions (mm)			Material	Curvature	Illustration
					Length	Width	Height			
W031-A31-60L-IHC	A31	Long	60°	-	39	40	31	Rexolite	On request	11
W032-A32-0L	A32	Long	0°	-	50	30	20	Rexolite	On request	10
W032-A32-0L-IHC	A32	Long	0°	-	50	40	20	Rexolite	On request	11
W032-A32-55S	A32	Shear	55°	-	61.5	30	33	Rexolite	On request	10
W032-A32-55S-IHC	A32	Shear	55°	-	61.5	40	33	Rexolite	On request	11
W032-A32-60L	A32	Long	60°	-	56	30	43	Rexolite	On request	10
W032-A32-60L-IHC	A32	Long	60°	-	56	40	43	Rexolite	On request	11

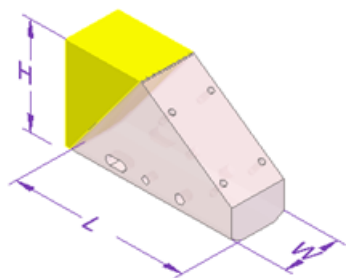


Illustration 10

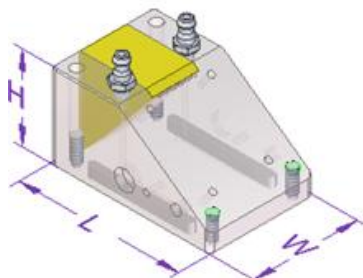


Illustration 11

Custom ultrasonic transducers

When the inspection objective and operating conditions require custom solutions

Applus+ has decades of experience developing specialist ultrasonic transducers for applications where conventional designs do not deliver the required performance. Our customised solutions support demanding NDT inspections involving coarse-grained materials, complex welds, near-surface flaw detection, internal bore inspection, deep-water use and high-temperature operating conditions.



Custom ultrasonic Phased Array transducers

For highly specific NDT inspection methods such as Automated Ultrasonic Testing (AUT) and Full Matrix Capture (FMC), we develop customised ultrasonic Phased Array transducers and matching wedges, engineered around the inspection task. This allows you to achieve the right balance of sensitivity, coverage and practicality for each application.



<i>Part number</i>	<i>Frequency (Mhz)</i>	<i>Wave type</i>	<i>Number of elements</i>	<i>Pitch (mm)</i>	<i>Active aperture (mm)</i>	<i>Elevation (mm)</i>	<i>Connector type</i>	<i>Connector location</i>	<i>Illustration</i>
PA101-4L64	4	Long	64	0.85	54.4	10	D-Sub	Rear	12
PA102-5L64	5	Long	64	1.00	64	10	D-Sub	Rear	12

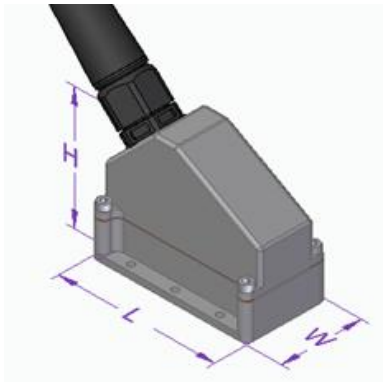


Illustration 12

Custom ultrasonic Phased Array wedges

Applus+ custom AUT and FMC wedges are engineered to maximize ultrasonic Phased Array inspection performance. Featuring an integrated acoustic lens for precise beam focusing, they deliver improved sensitivity, superior defect characterization, and consistent inspection results. Designed for application-specific requirements, our wedges ensure optimal beam steering and reliable acoustic coupling for even the most challenging inspections.

Key Features:

- Integrated Acoustic Focusing Lens
- Optimized Beam Steering
- Superior Defect Characterization
- Application-Specific Designs

Applications:

- Weld Inspection
- Pipeline Girth Welds
- Corrosion / Erosion Monitoring
- FMC & TFM Inspection
- Complex NDT Applications
- Automated Ultrasonic Testing (AUT)



Part number	Probe type	Wave type	Beam angle in carbon steel	Lens focusing	Wedge dimensions (mm)			Material	Curvature	Illustration
					Length	Width	Height			
W101-PA101-52S-RVS-Rax10-L75	PA101 (Applus+)	Shear	≈52°	Rax10	75	34	45	Pei	On request	13
W101-PA101-52S-RVS-Rax10-L80	PA101 (Applus+)	Shear	≈52°	Rax10	80	34	45	Pei	On request	13
W101-PA101-52S-MOD-Rax15-L80	PA101 (Applus+)	Shear	≈52°	Rax15	80	52*	41.6	Rexolite	On request	13
W102-PA102-52S-MOD-Rax14-L85	PA102 (Applus+)	Shear	≈52°	Rax14	85	53	64.2	Rexolite	On request	13

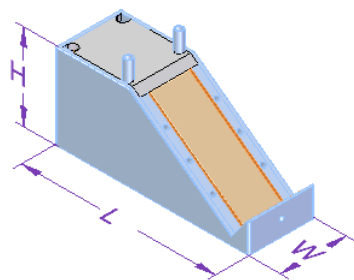
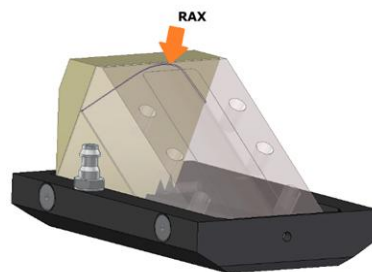


Illustration 13



Rax = Integrated axial
radius for phased array lens
focusing

Ultrasonic Transmit Receive Longitudinal transducers

NDT inspection of welds in coarse-grained steel, often used in nuclear power plants, can be challenging with conventional angle beam ultrasonic transducers due to grain scatter noise that compromises inspection results. Ultrasonic Transmit Receive Longitudinal (TRL) transducers, which feature dual elements, generate refracted longitudinal waves, thereby mitigating grain scattering and enhancing sensitivity within the zone where their signals converge. The distinct transmitter and receiver configuration further minimises wedge noise at elevated gain settings.

While the focusing characteristics of TRL ultrasonic transducers restrict the overall inspection range, these ultrasonic transducers demonstrate exceptional capability in identifying reflectors located within their focal range, rendering them particularly advantageous in challenging NDT inspection scenarios.



Nominal element size (mm)		2(7x10)	2(8x14)	2(10x18)	2(15x25)	2(20x34)	2(24x42)
Housing size (mm)		20x20	25x25	30x30	40x40	50x50	60x60
Frequency (MHz)	Angle	FS ~ min/max achievable (estimated) - (mm)					
0.5	45°	-	-	-	15 / 30	25 / 60	35 / 80
	60°	-	-	-	15 / 25	20 / 40	30 / 70
	70°	-	-	-	15 / 20	20 / 35	25 / 60
1	45°	-	10 / 25	15 / 30	20 / 55	30 / 80	40 / 120
	60°	-	10 / 20	15 / 30	20 / 45	25 / 75	35 / 110
	70°	-	10 / 20	15 / 30	15 / 45	25 / 75	30 / 100
2	45°	10 / 25	15 / 30	20 / 45	25 / 85	40 / 130	45 / 160
	60°	10 / 25	10 / 30	15 / 40	20 / 75	30 / 120	40 / 140
	70°	10 / 20	10 / 25	15 / 35	20 / 70	30 / 110	35 / 125
4	45°	10 / 35	20 / 60	25 / 90	30 / 100	-	-
	60°	10 / 35	15 / 55	20 / 70	25 / 90	-	-
	70°	10 / 30	10 / 50	15 / 65	20 / 85	-	-

Ultrasonic creeping wave transducers

Ultrasonic creeping wave transducers are a customised type of ultrasonic TRL-transducers, designed to generate compression waves at angles between 70° and 90° within the test material. These waves, referred to as creeping waves, travel parallel to the surface of the specimen; additionally, a shear wave beam is produced, radiating at an angle of approximately 33°. Nominal focus distances can extend up to 20mm, while the maximum practical range typically around 45mm.

These ultrasonic transducers are particularly effective for detecting and sizing flaws located near the surface, such as deep intergranular stress-corrosion cracking (IGSCC). Creeping waves exhibit resistance to interference from liquid droplets, welding spatters, or other surface contaminants. Nevertheless, their operational range is limited due to rapid energy attenuation, with the point of highest sensitivity, or "focus," situated directly in front of the ultrasonic transducer.



<i>Part number</i>	<i>Frequency (Mhz)</i>	<i>Wave type</i>	<i>Beam angle in carbon steel</i>	<i>Nominal element size</i>		<i>Focus in carbon steel (mm)</i>	<i>Focus in stainless steel (mm)</i>	<i>Connector type</i>	<i>Connector location</i>	<i>Illustration</i>
<i>SDC2FS10CS</i>	2	Long	-	2(0.24x0.51)	2(6x13)	10	-	LEMO-00	Top/Rear	1
<i>SDC2FS10SS</i>	2	Long	-	2(0.24x0.51)	2(6x13)	-	10	LEMO-00	Top/Rear	
<i>SDC4FS10CS</i>	4	Long	-	2(0.24x0.51)	2(6x13)	10	-	LEMO-00	Top/Rear	
<i>SDC4FS10SS</i>	4	Long	-	2(0.24x0.51)	2(6x13)	-	10	LEMO-00	Top/Rear	
<i>SDC2FS12CS</i>	2	Long	-	2(0.24x0.71)	2(6x18)	12	-	LEMO-00	Top/Rear	
<i>SDC2FS12SS</i>	2	Long	-	2(0.24x0.71)	2(6x18)	-	12	LEMO-00	Top/Rear	
<i>SDC4FS12CS</i>	4	Long	-	2(0.24x0.71)	2(6x18)	12	-	LEMO-00	Top/Rear	
<i>SDC4FS12SS</i>	4	Long	-	2(0.24x0.71)	2(6x18)	-	12	LEMO-00	Top/Rear	
<i>SDC2FS20CS</i>	2	Long	-	2(0.24x0.98)	2(6x25)	20	-	LEMO-00	Top/Rear	
<i>SDC2FS20SS</i>	2	Long	-	2(0.24x0.98)	2(6x25)	-	20	LEMO-00	Top/Rear	
<i>SDC4FS20CS</i>	4	Long	-	2(0.24x0.98)	2(6x25)	20	-	LEMO-00	Top/Rear	
<i>SDC4FS20SS</i>	4	Long	-	2(0.24x0.98)	2(6x25)	-	20	LEMO-00	Top/Rear	

Ultrasonic Long Long Trans transducers

More recent development for detection of flaws perpendicular to the surface is the Long Long Trans (LLT) technique. With this technique, mode conversion occurs at the defect instead of the back surface. The principle is explained in figure 1; this technique requires a special ultrasonic transducer equipped with dual elements (two crystals), since the angle of the shear wave is different from the compression wave.

This technique allows a choice of inspection depth zone by selecting the appropriate ultrasonic transducer characteristics. It is less suitable for NDT inspection inside austenitic welds, because one of the wave modes in the weld would be shear.

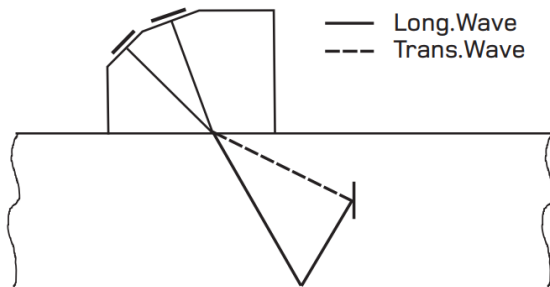
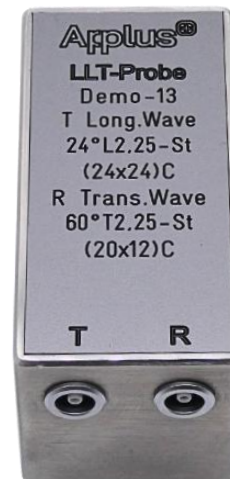


Figure 1 Principle of LLT technique



Ultrasonic Under Cladding Cracks transducer

Ultrasonic Under Cladding Crack (UCC) transducers are designed to detect under-cladding cracks. The ultrasonic UCC transducer was originally developed in the early seventies and is a good example of transducer optimization for a single application.

Figure 2 shows the principle of this ultrasonic UCC transducer by selection of element size (near field) and geometry (spherical), squint angle and frequency. In this manner, a high signal to noise ratio is obtained.

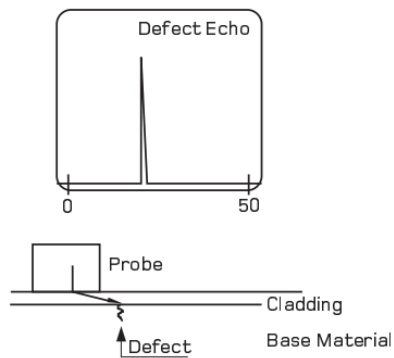


Figure 2 Principle of this ultrasonic UCC transducer



Ultrasonic Advanced Dual Element Probe Technology tandem transducer

The ultrasonic Advanced Dual Element Probe Technology (ADEPT) tandem transducer is a dual ultrasonic angle beam transducer designed for accurate sizing of Intergranular Stress Corrosion Cracking (IGSCC). Figure 3 shows the principle. Intelligent use is made of the longitudinal and shear waves generated by both transducer halves arranged in tandem technique, which transmit and receive at different angles.

This construction allows the ultrasonic transducer to have small width, which is attractive for use on both small and large cracks. For very thin or large wall thicknesses, other non-conventional ultrasonic transducer angles and frequencies can be used. This requires test samples for ultrasonic transducer optimization.

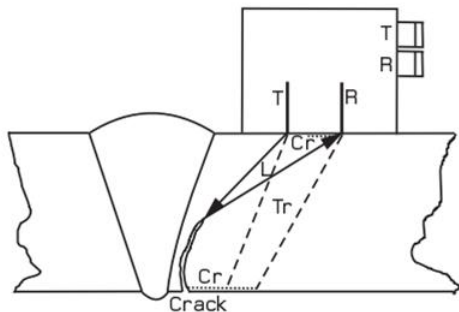


Figure 3 Principle of this ultrasonic ADEPT transducer



Ultrasonic Delta tandem transducer

Another ultrasonic transducer for sizing of Intergranular Stress Corrosion Cracking (IGSCC) applies the principle of the original Delta technique in a new application. By individual optimization of the transmitter and receiver angles and frequency an ultrasonic transducer can be developed whose principle is shown in figure 4. The crack tip diffraction method is applied. With small variations the required element combination can be selected. A more rugged single focus dual element ultrasonic transducer is more attractive for use in difficult environments such as nuclear power plants.

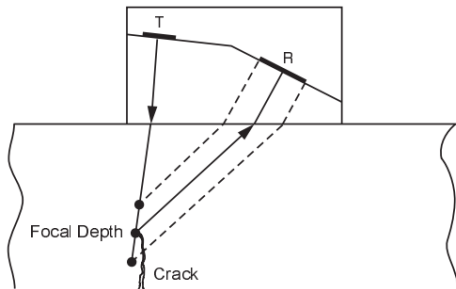


Figure 4 Principle of this ultrasonic IGSCC transducer



Accessories and supporting equipment

Because accurate results depend on a complete and reliable inspection setup

Applus+ offers a comprehensive range of accessories and supporting equipment designed to ensure precise calibration, consistent performance and reliable operation of ultrasonic transducers. From calibration blocks and cables to wedges and replacement parts, our solutions support efficient workflows and help maintain accuracy and probe performance in demanding Non-Destructive Testing (NDT) environments.

Ultrasonic Delta tandem transducer



Ultrasonic verification, calibration, characterisation blocks

To complete the NDT inspection setup, Applus+ supplies ultrasonic verification, calibration and characterisation blocks. These blocks are designed to support accurate setup, reliable performance and efficient day-to-day operation across a wide range of ultrasonic NDT inspection tasks.



Ultrasonic step wedges

Ultrasonic step wedges are used to support accurate thickness verification and instrument setup during ultrasonic NDT inspections. With multiple precisely machined thickness steps, they help inspection teams verify measurement accuracy and achieve consistent results across different material thicknesses.

Key features:

- Multiple calibrated thickness steps
- Supports ultrasonic thickness measurement and instrument setup
- Precisely machined for repeatable measurements
- Available in standard or customised dimensions and materials
- Suitable for workshop, laboratory and field NDT use



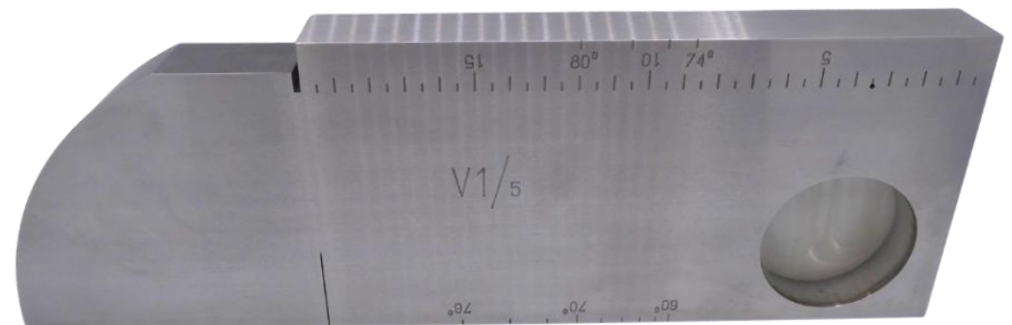
<i>Part number</i>	<i>Type</i>	<i>Material</i>	<i>Tolerance (mm)</i>	<i>Illustration</i>
SW C 2-20 mm step 2 20-20	Step Wedge from 2 to 20 mm, pad size 20×20 mm, Carbon Steel (steps: 2/4/6/8/10/12/14/16/18/20mm)	Carbon Steel 1018	±0.05	
SW SS 2-20 mm step 2 20-20	Step Wedge from 2 to 20 mm, pad size 20×20 mm, Stainless Steel (steps: 2/4/6/8/10/12/14/16/18/20mm)	Stainless Steel 304	±0.05	
SW AL 2-20 mm step 2 20-20	Step Wedge from 2 to 20 mm, pad size 20×20 mm, Aluminium (steps: 2/4/6/8/10/12/14/16/18/20mm)	Aluminium 7075	±0.05	
SW Casing	Step Wedge, Plastic Carrying Case	Plastic	-	

Ultrasonic V1 / A2 calibration block

The ultrasonic V1 / A2 calibration block is a widely used ultrasonic reference block for calibration and verification of ultrasonic NDT inspection equipment. It supports ultrasonic transducer checks, range calibration and angle verification, helping inspection teams achieve reliable instrument setup and consistent results during routine NDT activities.

Key features:

- Standard reference block for ultrasonic calibration
- Supports range calibration, ultrasonic transducer index and angle verification
- Suitable for straight beam and angle beam ultrasonic transducers
- Precisely machined for repeatable calibration results
- Available in standard or customised material grades where required



<i>Part number</i>	<i>Type</i>	<i>Material</i>	<i>Tolerance (mm)</i>	<i>Illustration</i>
V1 / A2 block C	V1 / A2 Calibration Block, 300x100x25 mm, Carbon Steel	Carbon Steel 1018	±0.05	
V1 / A2 block SS	V1 / A2 Calibration Block, 300x100x25 mm, Stainless Steel	Stainless Steel 304	±0.05	
V1 / A2 block AL	V1 / A2 Calibration Block, 300x100x25 mm, Aluminium	Aluminium 7075	±0.05	
V1 / A2 block Casing	V1 / A2 Calibration Block, Plastic Carrying Case	Plastic	-	

Ultrasonic No. 1 /K1 (V2) calibration block

The ultrasonic No. 1 /K1 (V2) calibration block is a compact ultrasonic reference block used for routine calibration and verification of ultrasonic inspection equipment. It supports instrument setup, probe checks and angle verification, helping inspection teams achieve consistent and reliable results during daily NDT activities.

Key features:

- Compact calibration block for routine ultrasonic setup
- Supports probe index, angle and time-base verification
- Suitable for checking straight beam and angle beam transducers
- Precisely machined for repeatable calibration results
- Available in standard or customised material grades where required



<i>Part number</i>	<i>Type</i>	<i>Material</i>	<i>Tolerance (mm)</i>	<i>Illustration</i>
No. 1 block C 1.5 -12.5 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 12.5 mm Thick, Carbon Steel	Carbon Steel 1018	±0.05	
No. 1 block SS 1.5 -12.5 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 12.5 mm Thick, Stainless Steel	Stainless Steel 304	±0.05	
No. 1 block AL 1.5 -12.5 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 12.5 mm Thick, Aluminium	Aluminium 7075	±0.05	
No. 1 block C 1.5 - 20 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 20 mm Thick, Carbon Steel	Carbon Steel 1018	±0.05	
No. 1 block SS 1.5 - 20 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 20 mm Thick, Stainless Steel	Stainless Steel 304	±0.05	
No. 1 block AL 1.5 - 20 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 20 mm Thick, Aluminium	Aluminium 7075	±0.05	
No. 1 block C 1.5 - 25 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 25 mm Thick, Carbon Steel	Carbon Steel 1018	±0.05	
No. 1 block SS 1.5 - 25 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 25 mm Thick, Stainless Steel	Stainless Steel 304	±0.05	
No. 1 block AL 1.5 - 25 mm	No. 1 / K1 (V2) Calibration Block, 1.5 mm hole, 25 mm Thick, Aluminium	Aluminium 7075	±0.05	
No. 1 block C 5 -12.5 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 12.5 mm Thick, Carbon Steel	Carbon Steel 1018	±0.05	
No. 1 block SS 5 -12.5 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 12.5 mm Thick, Stainless Steel	Stainless Steel 304	±0.05	
No. 1 block AL 5 -12.5 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 12.5 mm Thick, Aluminium	Aluminium 7075	±0.05	
No. 1 block C 5 - 20 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 20 mm Thick, Carbon Steel	Carbon Steel 1018	±0.05	

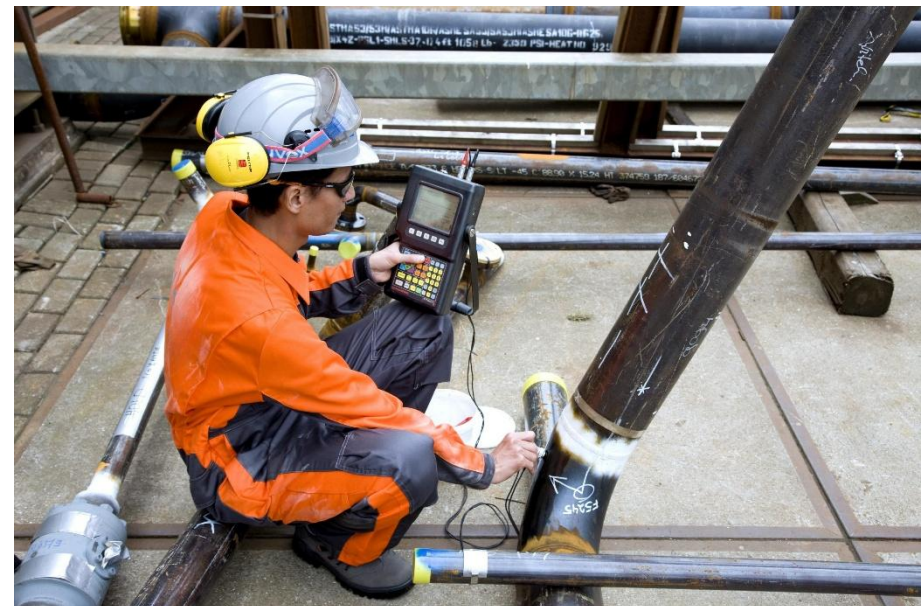
<i>Part number</i>	<i>Type</i>	<i>Material</i>	<i>Tolerance (mm)</i>	<i>Illustration</i>
No. 1 block SS 5 - 20 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 20 mm Thick, Stainless Steel	Stainless Steel 304	±0.05	
No. 1 block AL 5 - 20 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 20 mm Thick, Aluminium	Aluminium 7075	±0.05	
No. 1 block C 5 - 25 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 25 mm Thick, Carbon Steel	Carbon Steel 1018	±0.05	
No. 1 block SS 5 - 25 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 25 mm Thick, Stainless Steel	Stainless Steel 304	±0.05	
No. 1 block AL 5 - 25 mm	No. 1 / K1 (V2) Calibration Block, 5 mm hole, 25 mm Thick, Aluminium	Aluminium 7075	±0.05	
No. 1 Calibration and Serialization	No. 1 / K1 (V2) Calibration Block, Calibration and Serialization	-	-	
No. 1 block Casing	No. 1 / K1 (V2) Calibration Block, Plastic Carrying Case	Plastic	-	

Ultrasonic ASME-DAC calibration block

The ultrasonic ASME-DAC calibration block is used to support Distance Amplitude Correction (DAC) setup and sensitivity verification during ultrasonic NDT inspection. With precisely positioned reference reflectors, it helps inspection teams establish repeatable DAC curves and verify instrument response across different sound paths.

Key features:

- Supports DAC curve setup and sensitivity calibration
- Designed for ultrasonic NDT inspection setups requiring ASME-based reference blocks
- Precisely machined reference reflectors for repeatable results
- Helps verify ultrasonic instrument response across different distances
- Available in standard or customised material grades and dimensions where required



<i>Part number</i>	<i>Type</i>	<i>Material</i>	<i>Tolerance (mm)</i>	<i>Illustration</i>
ASME-DAC block C 19 mm	ASME DAC Calibration Block, 19 mm Tick, 3 side drilled holes at 1/4, 1/2 and 3/4 depths and 2 notches on the OD and ID surfaces at 2%T depth, Carbon Steel	Carbon Steel 1018	±0.05	
ASME-DAC block SS 19 mm	ASME DAC Calibration Block, 19 mm Tick, 3 side drilled holes at 1/4, 1/2 and 3/4 depths and 2 notches on the OD and ID surfaces at 2%T depth, Stainless Steel	Stainless Steel 304	±0.05	
ASME-DAC block AL 19 mm	ASME DAC Calibration Block, 19 mm Tick, 3 side drilled holes at 1/4, 1/2 and 3/4 depths and 2 notches on the OD and ID surfaces at 2%T depth, Aluminium	Aluminium 7075	±0.05	
ASME-DAC block C 38 mm	ASME DAC Calibration Block, 38 mm Tick, 3 side drilled holes at 1/4, 1/2 and 3/4 depths and 2 notches on the OD and ID surfaces at 2%T depth, Carbon Steel	Carbon Steel 1018	±0.05	
ASME-DAC block SS 38 mm	ASME DAC Calibration Block, 38 mm Tick, 3 side drilled holes at 1/4, 1/2 and 3/4 depths and 2 notches on the OD and ID surfaces at 2%T depth, Stainless Steel	Stainless Steel 304	±0.05	
ASME-DAC block AL 38 mm	ASME DAC Calibration Block, 38 mm Tick, 3 side drilled holes at 1/4, 1/2 and 3/4 depths and 2 notches on the OD and ID surfaces at 2%T depth, Aluminium	Aluminium 7075	±0.05	
ASME -DAC Calibration and Serialization	ASME -DAC Calibration Block, Calibration and Serialization	-	-	
ASME-DAC block Casing	ASME DAC Calibration Block, Plastic Carrying Case	Plastic	-	

Ultrasonic characterisation block

The ultrasonic characterisation block is used to evaluate the performance of ultrasonic transducers under controlled reference conditions. Manufactured from fine-grain austenitic stainless steel, it supports verification of focal distance, beam characteristics, ultrasonic transducer angle and signal-to-noise performance.

Key features:

- Fine-grain AISI 316L stainless steel reference block
- Sound velocity of $5,745 \pm 20$ m/s
- Supports focal curve and nominal focal distance verification
- Enables beam spread, zone height and angle assessment
- Helps determine signal-to-noise ratio in fine-grain steel
- Suitable for evaluating focused ultrasonic transducers



Ultrasonic time base calibration standard

The ultrasonic time base calibration standard is used for efficient time-base calibration and vertical linearity checks of ultrasonic flaw detectors. With a fixed aluminium sound path and integrated piezoelectric elements, it generates multiple reference echoes equivalent to defined shear wave and longitudinal wave paths in steel.

Key features:

- Supports time-base calibration of ultrasonic flaw detectors
- Generates multiple reference echoes for efficient setup
- Equivalent to a 50 mm shear wave path or 91 mm longitudinal wave path in steel
- Helps verify vertical linearity using echo amplitude response
- Available with piezoelectric elements at one or both ends



Ultrasonic cables

Applus+ supplies ultrasonic cables for reliable signal transmission between ultrasonic transducers and inspection instruments. Available in various connector types and cable grades, our cables support both standard inspection setups and customised NDT applications.

Key features:

- Standard cable length: 1.8 m
- Custom cable lengths available on request
- Various connector combinations and cable grades
- Suitable for conventional ultrasonic and Phased Array inspections
- 50-ohm impedance unless otherwise specified
- Special shielding and custom configurations available on request



Part number	Type	Connector type 1	Cable				Connector type 2
			Type	Material	Diameter (mm)	Length (m)	
<i>S-LEM00-LEM00-X</i>	Single	LEMO-00	RG174**	PUR	ø2.8	1,8*	LEMO-00
<i>D-LEM00-LEM00-X</i>	Dual	LEMO-00	D-RG174**	PUR	ø2.8	1,8*	LEMO-00
<i>S-LEM00-LEM1-X</i>	Single	LEMO-00	RG174**	PUR	ø2.8	1,8*	LEMO-1
<i>D-LEM00-LEM1-X</i>	Dual	LEMO-00	D-RG174**	PUR	ø2.8	1,8*	LEMO-1
<i>S-LEM00-BNC-X</i>	Single	LEMO-00	RG174**	PUR	ø2.8	1,8*	BNC
<i>S-LEM00-MICM-X</i>	Single	LEMO-00	RG174**	PUR	ø2.8	1,8*	Microdot Mini
<i>D-LEM00-MICM-MICL-X</i>	Dual	LEMO-00	D-RG174**	PUR	ø2.8	1,8*	Microdot Mini / Large
<i>S-LEM1-LEM1-X</i>	Single	LEMO-1	RG174**	PUR	ø2.8	1,8*	LEM1
<i>S-LEM1-BNC-X</i>	Single	LEMO-1	RG174**	PUR	ø2.8	1,8*	BNC
<i>S-LEM1-MICM-X</i>	Single	LEMO-1	RG174**	PUR	ø2.8	1,8*	Microdot Mini
<i>S-BNC-BNC-X</i>	Single	BNC	RG58	PUR	ø4.95	1,8*	BNC
<i>S-BNC-MICM-X</i>	Single	BNC	RG174	PUR	ø2.8	1,8*	Microdot Mini

*Default length 1.8m custom lengths available upon request.

**Cable type RG178 available upon request.



Lemo 00



Lemo 01



BNC



UHF



Microdot Mini



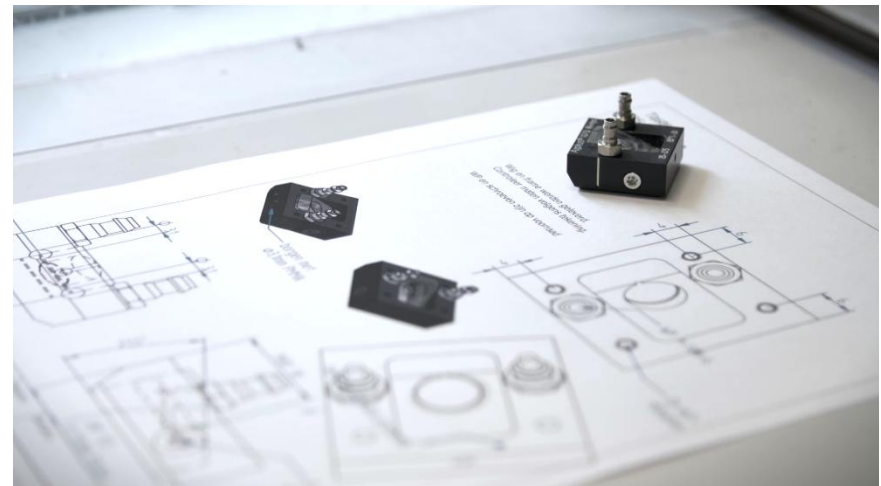
Microdot L

Ultrasonic parts

Applus+ supplies selected ultrasonic transducer parts and accessories to support reliable performance, maintenance and long-term use of ultrasonic inspection equipment. These components help inspection teams replace worn or application-specific parts and keep ultrasonic transducers ready for daily NDT use.

Key features:

- Selected replacement parts for ultrasonic transducers
- Supports maintenance, repair and continued equipment use
- Helps extend ultrasonic transducer service life
- Suitable for conventional ultrasonic and customised transducer solutions
- Available according to transducer type, application and configuration
- Technical support available to help identify the correct part or accessory



<i>Part number</i>	<i>Type</i>	<i>Suitable for ultrasonic transducer</i>	<i>Material</i>
B201-film-A001	Protective film	LSOL1 A001	-
B201-film-A002	Protective film	LSOL2 A002	-
B201-film-A003	Protective film	LSOL4 A003	-
B202-film-A004	Protective film	SSOL2 A004	-
B202-film-A005	Protective film	SSOL4 A005	-
B203-Ring-A001	Ring for protective film	LSOL1 A001	Aluminum
B203-Ring-A002	Ring for protective film	LSOL2 A002	Aluminum
B203-Ring-A003	Ring for protective film	LSOL4 A003	Aluminum
B204-Ring-A004	Ring for protective film	SSOL2 A004	Aluminum
B204-Ring-A005	Ring for protective film	SSOL4 A005	Aluminum
B205-A001	Wear Ring	LSOL1 A001	RVS
B205-A002	Wear Ring	LSOL2 A002	RVS
B205-A003	Wear Ring	LSOL4 A003	RVS
B206-A006	Wear Ring	SDOL10-3 A006	RVS
B206-A007	Wear Ring	SDOL10-3 A007	RVS
B207-A008	Wear Ring	SDOL5-10 A008	RVS

Customised to your NDT inspection challenge

Manual ultrasonic transducers

Our manual ultrasonic transducers provide flexible options for a wide range of NDT inspection requirements.

These ultrasonic transducers can be designed in various types of housings and with a sturdy plastic shoe (wedge) that extends 4mm from the bottom of the ultrasonic transducer. This design makes it easy to adapt them to curved surfaces.

Connectors are located at the back of the housing, which can be made from stainless steel or aluminium depending on the specific ultrasonic transducer type, to ensure ease of use during operation.

Mechanized ultrasonic transducer

For automated and encoded scanning, our mechanized ultrasonic transducers feature:

- Plastic shoe (wedge) flush with stainless steel housing for enhanced durability
- Optional stainless steel inserts or carbides for added wear resistance.
- Water nozzles on top of the housing for internal couplant delivery
- Integrated connectors (chassis jacks) and fittings for secure attachment to transducer holders

All ultrasonic transducers can be custom designed for use with specialized manipulators in automated inspection systems. Housed in robust stainless steel casings, these transducers attach easily to gimbal-type holders, ensuring reliable performance in demanding environments.

Contoured wedge options

Contoured ultrasonic wedges are designed to improve contact and coupling on curved inspection surfaces such as pipes, tubes and cylindrical components. By matching the wedge surface to the outside diameter of the component, the ultrasonic beam can be introduced more consistently into the material. This supports improved signal stability, repeatable positioning and reliable inspection performance, especially in applications where a flat wedge does not provide sufficient surface contact.

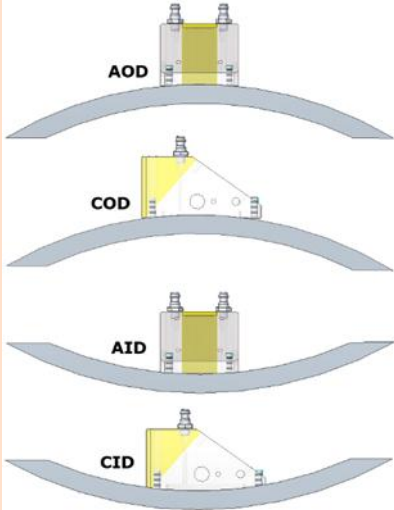
Applus+ can supply wedge curvature options for standard and customised ultrasonic wedge configurations. Curvature can be specified according to the inspection geometry, component diameter and required scanning direction, helping inspection teams optimise setup quality for demanding NDT applications.

Key features:

- Curved wedge contact surface for improved coupling on cylindrical components
- Available for outside diameter inspection surfaces
- Supports more stable probe positioning during manual or encoded scanning
- Helps maintain consistent ultrasonic beam entry and inspection repeatability
- Available on request for selected standard and customised wedge designs

Applications:

- Pipe and tube weld inspection
- Curved component inspection
- Weld inspection on small or large diameter components
- Applications where flat wedges do not provide adequate surface contact

Measured external pipe diameter (inches)	
	
AOD	Axial Outside Diameter
COD	Circumferential Outside Diameter
AID	Axial Inside Diameter
CID	Circumferential Inside Diameter

Contact

Whether you need a proven conventional ultrasonic transducer straight from stock, a customised solution for a complex NDT inspection challenge or expert guidance on the right configuration, Applus+ is ready to help.



ISO 9001:2015

Approval number: ISO 9001 – 0024447



Worldwide network



Expert guidance



Technical support



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