



## 37DL PLUS

### Corrosion Thickness Gage

#### FEATURES

- New Thru-Coat™ technology measures and displays the thickness of the metal part and its coating using a 'single backwall echo'.
- New Temperature Compensation feature adjusts the material velocity for changes in material temperature.
- New optional Oxide/Scale feature measures and displays the thickness of the steel and the oxide/scale build-up.
- New Average/Min mode saves the average or minimum of several successive thickness measurements.
- New A-scan display is brighter with better contrast and visibility.
- New: uses a vast array of dual element and single element contact, delay line, and immersion transducers.
- EMAT transducers for no-couplant steel thickness measurements through heavily scaled surfaces.
- The file-based alphanumeric datalogger can use longer file names (32 character max) and ID numbers (20 character max).
- Improved: every thickness reading in a stored B-scan can now be reviewed in the WIN37DL PLUS Interface Program and on the gage.
- Improved: select to view (Min/Max, Alarm, or A-scan flags) flags for Grid points.
- Grid files can be expanded by adding rows or columns or by changing the incrementing direction.

### ADVANCED ULTRASONIC CORROSION GAGE

The Panametrics-NDT™ 37DL PLUS is an advanced nondestructive ultrasonic thickness gage that combines powerful measurement features with sophisticated data acquisition and output capabilities for applications involving pipes, tanks, and other metal structures subject to internal corrosion or erosion. The 37DL PLUS includes many innovative features that simplify true metal thickness measurements even when the exposed surface is coated or painted. A new Thru-Coat technology measures and displays the thickness of the metal part and its coating using a 'single backwall echo'. A new Oxide/Scale option measures and displays the thickness of the steel and the oxide/scale build-up on the inside of boiler tubes to help predict tube life. Accuracy of high temperature thickness measurements can be improved by using the new Temperature Compensation feature that adjusts the material velocity

for changes in material temperature. A new Average/Min mode saves the average or minimum of several successive thickness measurements.

#### IMPROVEMENTS

New 37DL PLUS electronics bring improvements to many standard measurement features. The new A-scan display is brighter with better contrast and visibility. Every thickness reading in a stored B-scan can now be reviewed on the 37DL PLUS and in the Interface Program. The user can select to view (Min/Max, Alarm, or A-scan flags) flags with Grid points. The file-based alphanumeric datalogger can use longer file names (32 character max) and ID numbers (20 character max). Grid files can be expanded by adding rows or columns or by changing the incrementing direction.

## NEW TRANSDUCERS

The 37DL PLUS can be used with a vast array of dual element and single element transducers. Its full line of D790 series dual element transducers feature Automatic Probe Recognition to provide maximum gage performance for each transducer. The 37DL PLUS also has the ability to use the E110-SB EMAT transducer for no-couplant steel thickness measurements through oxide-scaled surfaces. The M2017 and M2091 transducers are ideally suited for measuring internal oxide/scale build-up on boiler tubes. The 37DL PLUS is also compatible with the Panametrics-NDT complete line of Microscan single element direct contact, delay line, and immersion transducers ranging in frequency from 2 to 30 MHz. As a result, the gage can be used for non-corrosion applications involving materials such as plastic, fiberglass, composites, rubber, castings, rubber and glass. Application Auto-Recall automatically recalls 16 default and 10 custom Microscan transducer setups from the gage's memory.

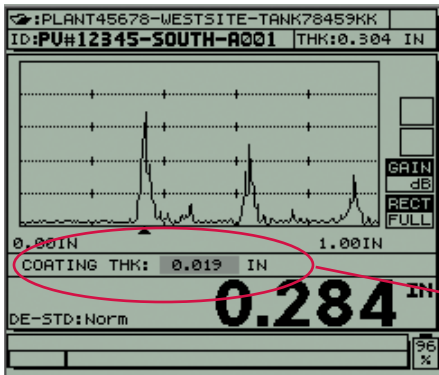


## TRANSDUCERS WITH AUTOMATIC PROBE RECOGNITION AND SINGLE ELEMENT TRANSDUCERS

PROBE	MHZ	CABLE	CONN	TIP DIA	RANGE (steel)*	TEMP RANGE**	WAND	HOLDER (w/wand)
D790		Potted	Straight	.434"	0.040"-20"	-5° – 932°F	F152	F152A
D790-SM	5.0	LCMD-316-5B†	Straight	(11.0 mm)	(1-500 mm)	(-20° – 500°C)	F152	F152A
D790-RL		LCLD-316-5G†	Rt. Angle				–	–
D790-SL		LCLD-316-5H	Straight					
D791	5.0	Potted	Rt. Angle	.434"	0.040"-20"	-5° – 932°F	F153	
				(11.0 mm)	(1-500 mm)	(-20° – 500°C)	–	–
D791-RM	5.0	LCMD-316-5C	Rt. Angle	.434"	0.040"-20"	-5° – 752°F	–	–
				(11.0 mm)	(1-500 mm)	(-20° – 400°C)	–	–
D792	10	Potted	Straight	.283"	0.020"-1"	32° – 122°F	F150	F150A
D793		Potted	Rt. Angle	(7.2 mm)	(0.5-25 mm)	(0° – 50°C)	F151	
D794	5.0	Potted	Straight	.283"	0.030"-2"	32° – 122°F	F150	F150A
D795		Potted	Rt. Angle	(7.2 mm)	(0.75-50 mm)	(0° – 50°C)	F151	–
D797	2.0	Potted	Rt. Angle	.900"	0.150"-25.00"	-5° – 752°F	–	–
D797-SM		LCMD-316-5D	Straight	(22.9 mm)	(3.8-635 mm)	(-20° – 400°C)	–	–
D7226	7.5	Potted	Rt. Angle	.350"	0.028"-4"	-5° – 300°F	–	–
D798-LF				(8.9 mm)	(0.71-100 mm)	(-20° – 150°C)	–	–
D798	7.5	Potted	Rt. Angle	.283"	0.028"-4"	-5° – 300°F	–	–
D798-SM		LCMD-316-5J	Straight	(7.2 mm)	(0.71-100 mm)	(-20° – 150°C)	–	–
D799	5.0	Potted	Rt. Angle	.434"	0.040"-20"	-5° – 300°F	–	–
				(11.0 mm)	(1-500 mm)	(-20° – 150°C)	–	–
MTD705	5.0	LCLPD-78-5	Rt. Angle	.200"	0.040"-0.75"	32° – 122°F	–	–
				(5.1 mm)	(1.0-19 mm)	(0° – 50°C)	–	–
V260-SM		LCM-74-4	Straight	0.080"	0.020" –0.400"	32° – 122°F	Sonopen®	
V260-RM		LCM-74-4	Rt. Angle	(2.0 mm)	(0.5-10 mm)	(0° – 50°C)		
V260-45		LCM-74-x	45° Angle					
D7906-SM††	5.0	LCMD-316-5L	Straight	.434"	0.040"-2.0"	32° – 122°F	F152	F152A
				(11.0 mm)	(1-50 mm)	(0° – 50°C)		
D7908††	7.5	Potted	Rt. Angle	.283"	0.028"-1.5"		–	–
				(7.2 mm)	(0.71-37 mm)			
M2017	20	LCM-74-4	Rt. Angle	0.25"	Steel 0.020"-0.500"	32° – 122°F	–	2127
				(6.35 mm)	(0.5-12.0 mm)	(0° – 50° C)		
					Oxide 0.010"-0.050"			
					(0.25-1.25 mm)			
M2091	20	LCM-74-4	Rt. Angle	0.25"	Steel 0.020"-0.500"	32° – 122°F	–	2127
				(6.35 mm)	(0.5-12.0 mm)	(0° – 50° C)		
					Oxide 0.006"-0.050"			
					(0.15-1.25 mm)			
E110-SB		LCB-74-4 and 1/2XA/E110	Straight	1.25"	0.080"-5.00"	32° – 176°F	–	–
				(28.5 mm)	(2.0-125 mm)	(0° – 80°C)		

\* Dependent on material, transducer type, surface condition, and temperature  
 \*\* Maximum temperature is with intermittent contact only

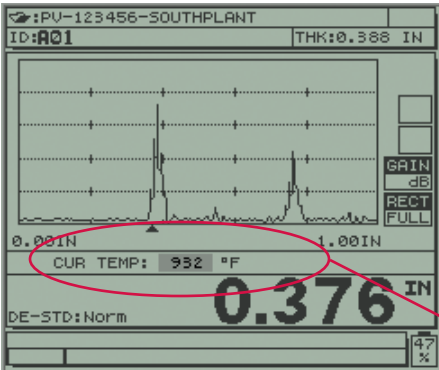
† Stainless steel cable available; consult us for part numbers  
 †† Transducers used for Thru-Coat technology



## THRU-COAT™ TECHNOLOGY

This innovative feature uses a single backwall echo to measure true metal thickness. The 37DL PLUS can display both metal and coating thickness, each adjusted for their correct material sound velocity. The gage can be set to display only the true metal thickness. There is no need to remove the paint or coating from the surface. Thru-Coat measurements use the new D7906-SM and D7908 dual element transducers.

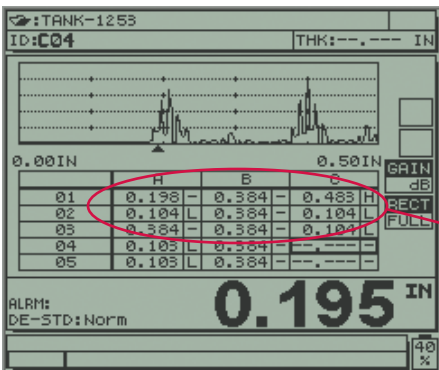
The 37DL PLUS automatically calculates and displays both the coating thickness (0.019") and the material thickness (0.284") with a single backwall echo.



## TEMPERATURE COMPENSATION

Variations in material temperature cause changes in sound velocity that may affect the accuracy of the thickness measurement. The Temperature Compensation feature allows the user to enter the calibration block temperature and also manually or automatically input the current (high) temperature at the measurement points. The 37DL PLUS will display the temperature corrected thickness that can then be saved to the internal datalogger.

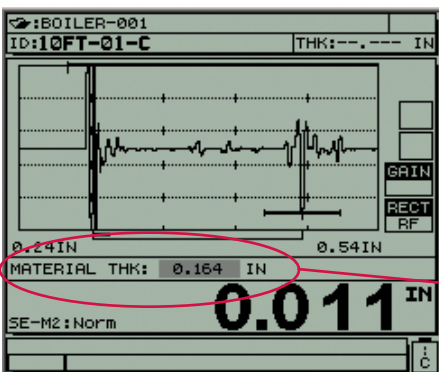
The thickness reading of 0.376" is compensated for the change in material sound velocity due to the temperature difference between the calibrated temperature and the material temperature (932°F).



## DB GRID VIEW

The improved Grid View feature allows the user to select either a Min/Max, Alarm, or A-scan flag to be viewed along with each grid point. This allows the user to quickly scan through a file and locate Min/Max, Alarm, or A-scan locations.

Flags clearly indicate (H) High Alarm and (L) Low Alarm thickness measurements.



## OPTIONAL OXIDE/SCALE MEASUREMENT

This new option uses advanced algorithms to measure the thickness of oxide/scale build-up on the inside of boiler tubes. The gage simultaneously displays the metal thickness of the boiler tube and the thickness of the oxide layer. Knowing the thickness of the oxide/scale helps predict tube life. We recommend the use of the M2017 or M2091 transducer for this application.

The 37DL PLUS displays the material thickness (0.164") and scale thickness (0.011") simultaneously.

# 37DL PLUS SPECIFICATIONS\*

**Dual Element Measurement Mode:** Time interval from a precision delay after the excitation pulse to the first echo.

**Thru-Coat Measurement:** Measurement of true metal and coating thickness using a single backwall echo (with D7906-SM and D7908 transducers).

**Thru-Paint Echo-to-Echo:** Time interval between two successive back-wall echoes for elimination of paint or coating .

**Single Element Measurement Mode: Mode 1:** Time interval between excitation pulse to first backwall echo.

**Mode 2:** Time interval between delay line echo to first backwall echo with delay or immersion transducers.

**Mode 3:** Time interval between successive backwall echoes following the first interface echo after the excitation pulse with delay line or immersion transducers.

**Optional Oxide/Scale Measurement:** Measure metal thickness and internal oxide/scale build-up of pipes. Oxide/scale thickness range:  
M2017: 0.010 - 0.050" (0.25 - 1.25 mm)  
M2091: 0.006 - 0.050" (0.15 - 1.25 mm)

**Thickness Range:**  
0.003 - 25.000 inches (0.080 - 635.00mm), depending on material, transducer surface condition, temperature, and SETUP selected

**Material Velocity Range:**  
0.020 - 0.551 inch/ $\mu$ S  
(0.508 - 13.998 mm/ $\mu$ S)

**Resolution, selectable:**  
LOW: 0.01" 0.1 mm  
STANDARD: 0.001" 0.01 mm

**Battery:**  
6V rechargeable NiCad battery pack, or field-replaceable alkaline AA batteries

**Battery Life:**  
25 hours in normal measurement mode with backlight off

**Fast-Charger:**  
Two-hour Fast-Charger with universal voltage

**Transducer Frequency Range:**  
2-30 MHz (-3 dB)

**Operating Temperature:**  
-10 to +50°C (+14° to 122°F)

**Keypad:**  
Sealed color-coded keypad with tactile and audible feedback

**Case:**  
Impact-resistant and Water-resistant, gasketed Lexan® case with sealed connectors. Environmental IP-65 compliant

**Liquid Crystal Display:**  
With backlight. Contrast keypad adjustable. Display area 4.0 x 3.39 inch (102 x 86 mm)

**Hazardous Area Operations:**  
As defined by MIL-STD-810E, method 511.3, procedure 1

**Rectification:**  
Full wave, RF, half wave positive, or half wave negative

**Display Range and Delay Control Metric/English Units**

**Size:**  
9.375 x 5.45 x 1.5" (238 x 138 x 38 mm)

**Weight:**  
2.1 lbs. (0.95 Kg)

## INTERNAL DATALOGGER

**Datalogger and RS-232:**  
The 37DL PLUS identifies, stores, recalls, clears, and transmits thickness readings, waveform images, and gage setup information via the RS-232 serial port. Baud Rate, Word Length, Stop Bits, and Parity are adjustable from the keypad.

**Maximum # of Stored Values:**  
Standard: 60,000 thickness readings or 4,500 waveforms with thickness readings

**File Names, ID# and Comments:**  
32 character file name plus 20 character alphanumeric location code with 4 comments per location

**File Structures:**  
7 standard or custom application-specific file structures

**Reports:**  
On-gage reporting of summary with statistics, Min/Max with locations, File Comparison, and Alarm Report. On-screen comparison of current and previous readings.

## STANDARD INCLUSIONS

Model 37DL PLUS Digital Ultrasonic Thickness Gage with Waveform Verification, AC or Battery Operation, 50-60 Hz

- D790-SM Transducer, 5.0 MHz, 0.434" (11mm) tip, temp. range -5° to 932°F
- Charger/AC adapter (100, 115, 230 VAC)
- Internal Datalogger
- WIN37DL PLUS Interface Program
- Test Block and Couplant
- RS-232 Cable
- Protective Pouch with Neck Strap
- Instruction Manual
- Two-Year Limited Warranty
- Measurement features: Thru-Coat, Echo-to-Echo Thru-Paint, EMAT Compatibility, Min/Max Mode, Two Alarm Modes, Differential Mode, B-scan, Application Auto Recall, Temperature Compensation, Average/Min Mode

## OPTIONAL ACCESSORIES

37DLP/EW Third-Year warranty

WIN37DL PLUS/CCG (Color-coded Grid software)

36CA/EC-115 External Fast Charger, 115 VAC

37DLP/SU/OXIDE Software option for the measurement of boiler tubes and internal oxide

1/2XA/E110 Filter adapter for E110-SB EMAT transducer

# OLYMPUS

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