

ISONIC EXPERT DUET Technology

- Planar butt welds
- Circumferential butt welds
- Longitudinal welds (long seams)
- Symmetrical and asymmetrical bevel
- With and without misalignment
- Scanning from both sides of the weld along the fusion line:
 - Manual
 - Mechanized
 - Automatic
- Strip chart recording
- 100% raw data capturing
- True-to-Geometry imaging
- FMC/TFM Protocol for the data acquisition and imaging
- Comprehensive postprocessing



ISONIC DUET and **ISONIC DUET M** software applications were created for the inspection of various welds, namely:

- planar butt welds
- circumferential butt welds (girth welds)
- longitudinal welds (long seams)

performed through the scanning along the fusion line from both sides with use of a pair of wedged linear array probes. The welds inspected with use of the **ISONIC DUET Technology** may have either *symmetrical or asymmetrical bevel with or without misalignment of the welded components*

ISONIC DUET and **ISONIC DUET M** software options are available for the **ISONIC 3510**, **ISONIC 2010**, and **ISONIC 2009 UPA Scope** instruments

The sectorial and / or linear cross-sectional scan files composing the scan plan for implementing of the **ISONIC DUET Technology** based inspection should be created in the *one side inspection* software either **ISONIC EXPERT**, **ISONIC EXPERT A**, or **ISONIC EXPERT CU** corresponding to the shape of the weld to be examined

True to geometry coverage and imaging of the weld & HAZ volume is provided for each PA probe separately and in the overlap; each PA probe may implement a number of insonification schemes simultaneously (**2 X MULTIGROUP** mode)





TOFD A-Scan for the vertical planar defect obtained with the use of a pair of regular probes connected to ISONIC 2005 instrument (UDS 3-5 Pulser Receiver)

For the first time ever the complimentary TOFD inspection with forming of up to 4 separate shots (depending on the material thickness) may be performed out of the same pair of PA probes. This novel way of implementing TOFD examination has been proven by the numerous comparison tests with regular probes connected to various types of conventional instruments (channels). It's already recognized by the international standard EN ISO 13588:2019 and a number of other national and industry codes

The dual modality (PA + TOFD) inspection with use the same pair of PA Probes extremely simplifies and lightens the structure of the scanning frame



TOFD A-Scan obtained on the vertical planar defect with use of a pair of PA probes of the same frequency as regular TOFD probes



TOFD A-Scan for the vertical planar defect obtained with the use of a pair of regular probes connected to the conventional channel of ISONIC 3510 instrument (UDS 3-6 Pulser Receiver)

For the first time ever the complimentary TOFD inspection with forming of up to 4 separate shots (depending on the material thickness) may be performed out of the same pair of PA probes. This novel way of implementing TOFD examination has been proven by the numerous comparison tests with regular probes connected to various types of conventional instruments (channels). It's already recognized by the international standard EN ISO 13588:2019 and a number of other national and industry codes

The dual modality (PA + TOFD) inspection with use the same pair of PA Probes extremely simplifies and lightens the structure of the scanning frame



TOFD A-Scan obtained on the vertical planar defect with use of a pair of PA probes of the same frequency as regular TOFD probes



TOFD A-Scan for the vertical planar defect obtained with the use of a pair of regular probes connected to ISONIC 3505 instrument (UDS 3-9 Pulser Receiver)

For the first time ever the complimentary TOFD inspection with forming of up to 4 separate shots (depending on the material thickness) may be performed out of the same pair of PA probes. This novel way of implementing TOFD examination has been proven by the numerous comparison tests with regular probes connected to various types of conventional instruments (channels). It's already recognized by the international standard EN ISO 13588:2019 and a number of other national and industry codes

The dual modality (PA + TOFD) inspection with use the same pair of PA Probes extremely simplifies and lightens the structure of the scanning frame



TOFD A-Scan obtained on the vertical planar defect with use of a pair of PA probes of the same frequency as regular TOFD probes



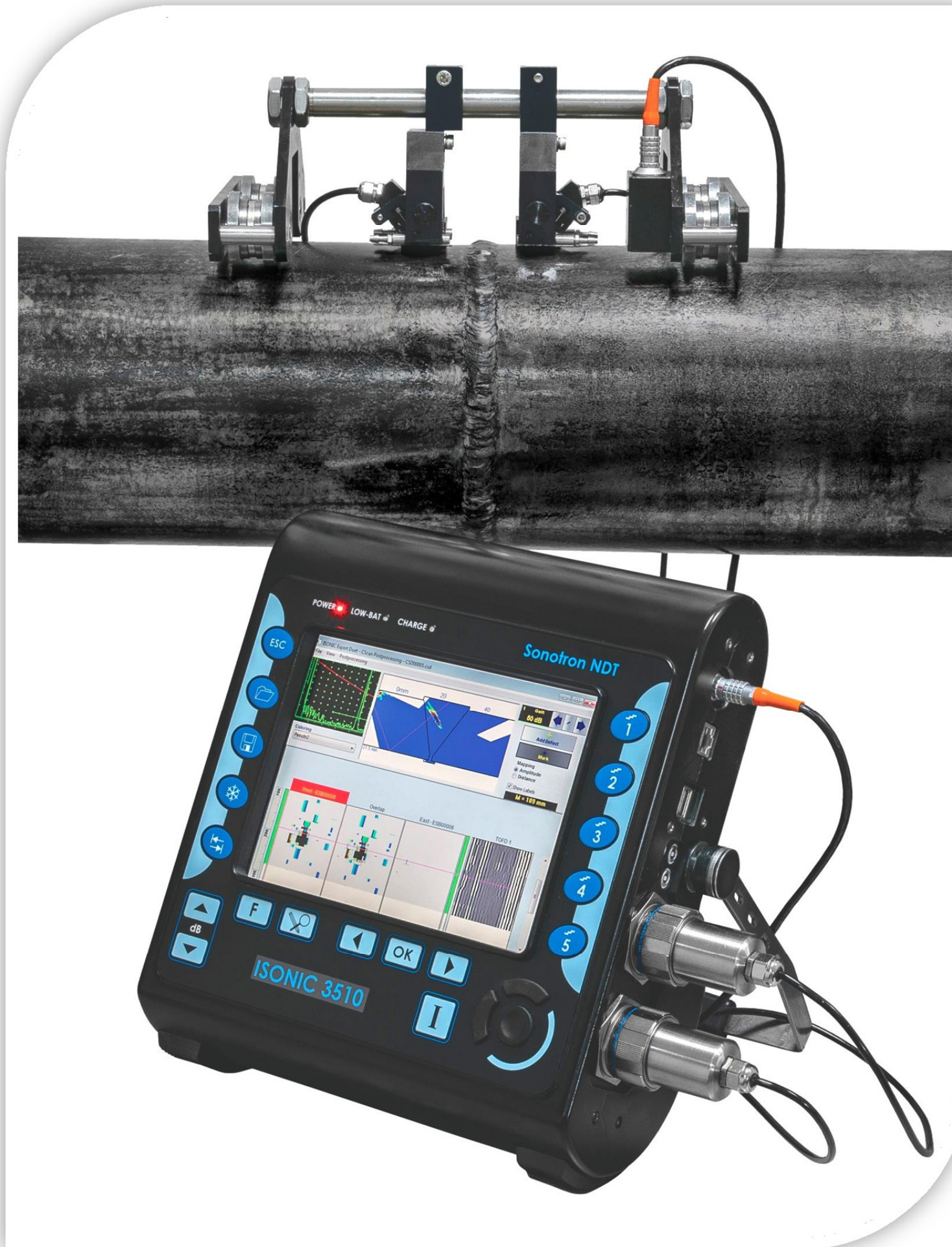




Item	Order Code (Part #)
<p>Inspection SW Application for ISONIC 3510 - Phased Array Modality: DUET - EXPERT - Inspection of the planar or circumferential butt welds with symmetrical / asymmetrical bevel and longitudinal welds in pipes and pressure vessels using a pair of wedged linear array probes combining sector / linear scan pulse echo and TOFD techniques - strip recording and true to geometry imaging</p> <ul style="list-style-type: none"> ⇒ Scanning of Planar / Circumferential Butt Welds / Longitudinal Welds from Both Sides Using Wedged PA Probes ⇒ Multi-Group Cross Sectional Coverage from Both Sides of The Weld - Built-In Intuitive Weld Bevel Coverage Composer ⇒ Sector-Scan, B-Scan (Linear Scan), and Combined Cross Sectional Coverage ⇒ True-To-Geometry Weld Overlay Volume Corrected Imaging - Cross Sectional and Top (C-Scan)- / Side- / End- View and 3D a West- / East- / Both Sides Top View Overlap ⇒ TOFD Insonifications (up to 4) implemented by the Same Pair of Wedged PA Probes (recognized by the international standard EN ISO 13588:2012 and a number of other national and industry codes) ⇒ Strip Chart ⇒ DAC / TCG Normalization ⇒ Independent on TCG Angle Gain Compensation / Gain Per Focal Law Correction ⇒ Automatic Coupling Monitor ⇒ Encoded and Time Based Recording ⇒ 100% Raw Data Capturing ⇒ FMC/TFM Protocol for the data acquisition and imaging ⇒ Editable Defects List ⇒ Comprehensive Postprocessing Including: <ul style="list-style-type: none"> → Recovery and Evaluation of Recorded Cross Sectional Views (Sector Scan / B-Scan) and TOFD A-Scans within Entire Strip Chart → Marking and Sizing Defects, Entering into Defect List within Entire Strip Chart → Exporting Every Desired PA Strip into a Separate C-Scan File → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Views (Sector Scan / B-Scan) and C-Scans for Each Group Inspection → Recovery of Cross Sectional Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude db-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → All Functional TOFD Postprocessing Including: <ul style="list-style-type: none"> ▷ Off-Line Gain Manipulation ▷ Parabolic Cursors ▷ SAFT ▷ Defects Height / Depth Measurements ▷ Linearization ▷ Straightening ▷ Removal Lateral Wave for Increasing Near Surface Detection Ability ▷ Rectification ▷ Zooming Desired Segments of TOFD Map → Automatic creating of inspection reports - hard copy / PDF File / MS Word File 	SWA 3510026



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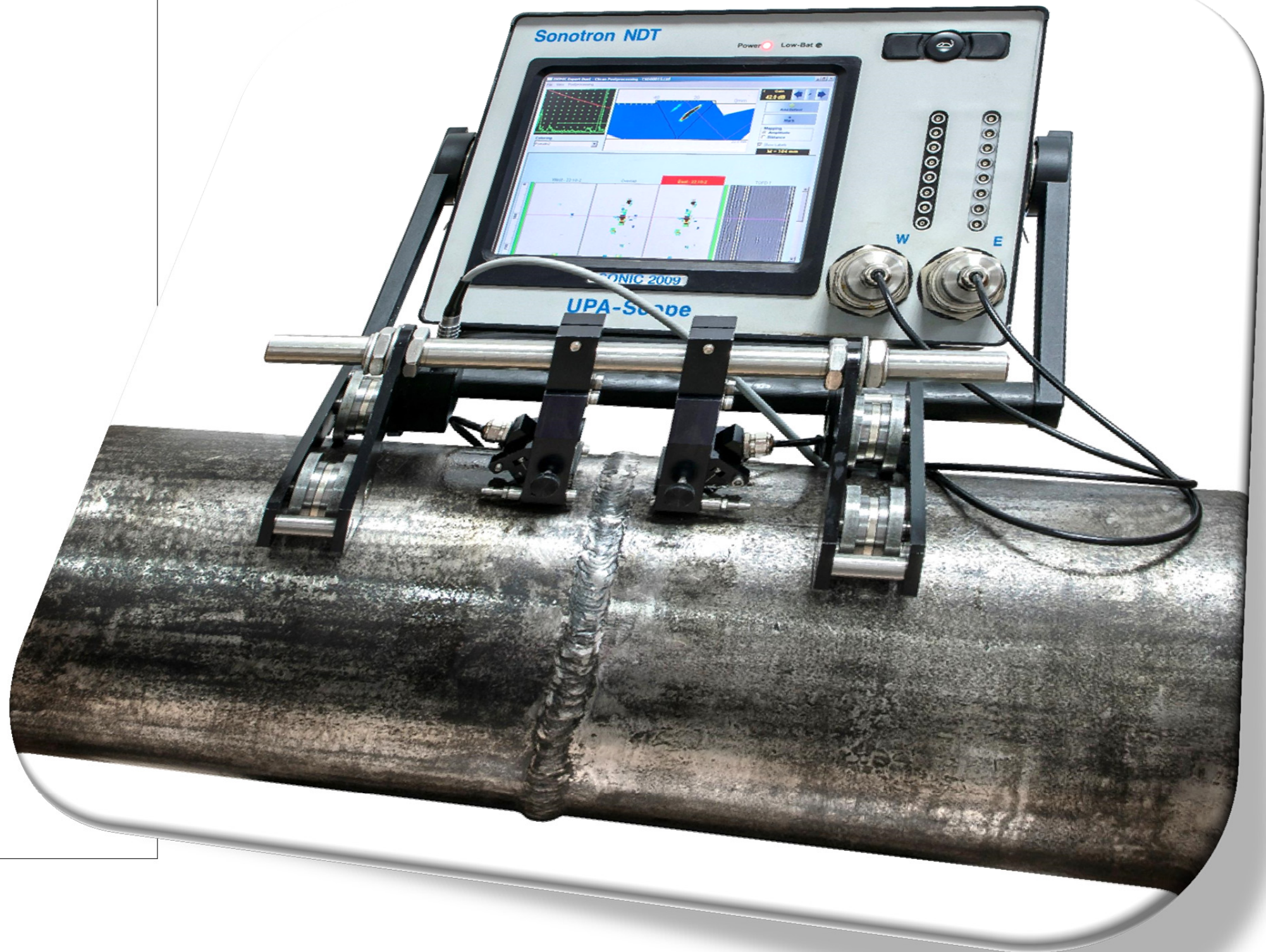
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<p>Inspection SW Application for ISONIC 2010 / ISONIC 2010 EL - Phased Array Modality: DUET - EXPERT Inspection of the planar or circumferential butt welds with symmetrical / asymmetrical bevel and longitudinal welds in pipes and pressure vessels using a pair of wedged linear array probes combining sector / linear scan pulse echo and TOFD techniques - strip chart recording and true to geometry imaging</p> <ul style="list-style-type: none"> ⇒ Scanning of Planar / Circumferential Butt Welds / Longitudinal Welds from Both Sides Using Wedged PA Probes ⇒ Multi-Group Cross Sectional Coverage from Both Sides of The Weld - Built-In Intuitive Weld Bevel Coverage Composer ⇒ Sector-Scan, B-Scan (Linear Scan), and Combined Cross Sectional Coverage ⇒ True-To-Geometry Weld Overlay Volume Corrected Imaging - Cross Sectional and Top (C-Scan)- / Side- / End- View and 3D a West- / East- / Both Sides Top View Overlap ⇒ TOFD Insonifications (up to 4) implemented by the Same Pair of Wedged PA Probes (recognized by the international standard EN ISO 13588:2012 and a number of other national and industry codes) ⇒ Strip Chart ⇒ DAC / TCG Normalization ⇒ Independent on TCG Angle Gain Compensation / Gain Per Focal Law Correction ⇒ Automatic Coupling Monitor ⇒ Encoded and Time Based Recording ⇒ 100% Raw Data Capturing ⇒ FMC/TFM Protocol for the data acquisition and imaging ⇒ Editable Defects List ⇒ Comprehensive Postprocessing Including: <ul style="list-style-type: none"> → Recovery and Evaluation of Recorded Cross Sectional Views (Sector Scan / B-Scan) and TOFD A-Scans within Entire Strip Chart → Marking and Sizing Defects, Entering into Defect List within Entire Strip Chart → Exporting Every Desired PA Strip into a Separate C-Scan File → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Views (Sector Scan / B-Scan) and C-Scans for Each Group Inspection → Recovery of Cross Sectional Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude db-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → All Functional TOFD Postprocessing Including: <ul style="list-style-type: none"> ▷ Off-Line Gain Manipulation ▷ Parabolic Cursors ▷ SAFT ▷ Defects Height / Depth Measurements ▷ Linearization ▷ Straightening ▷ Removal Lateral Wave for Increasing Near Surface Detection Ability ▷ Rectification ▷ Zooming Desired Segments of TOFD Map → Automatic creating of inspection reports - hard copy / PDF File / MS Word File 	SWA 910826



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<p>Inspection SW Application for ISONIC 2010 / ISONIC 2010 EL - Phased Array Modality: DUET - EXPERT - M Inspection of the planar or circumferential butt welds with symmetrical / asymmetrical bevel and longitudinal welds in pipes and pressure vessels using a pair of wedged linear array probes combining sector / linear scan pulse echo and TOFD techniques in combination with conventional TOFD and PE probes - strip chart recording and true to geometry imaging</p> <ul style="list-style-type: none"> ⇒ Scanning of Planar / Circumferential Butt Welds / Longitudinal Welds from Both Sides Using Wedged PA Probes ⇒ Multi-Group Cross Sectional Coverage from Both Sides of The Weld - Built-In Intuitive Weld Bevel Coverage Composer ⇒ Sector-Scan, B-Scan (Linear Scan), and Combined Cross Sectional Coverage ⇒ True-To-Geometry Weld Overlay Volume Corrected Imaging - Cross Sectional and Top(C-Scan)- / Side- / End- View and 3D a West- / East- / Both Sides Top View Overlap <ul style="list-style-type: none"> ⇒ TOFD Insonifications (up to 4) implemented by the Same Pair of Wedged PA Probes (recognized by the international standard EN ISO 13588:2012 and a number of other national and industry codes) OR by conventional TOFD Probes (1 pair of TOFD probes in the instruments carrying 1 conventional channel / up to 4 pairs of TOFD probes in the instruments carrying 8 or 16 conventional channels ⇒ X-pattern pitch-catch insonification for the detection of transversal conventional PE Probes (1 pair of PE probes in the instruments carrying 1 conventional channel / up to 2 pairs of PE probes in the instruments carrying 8 or 16 conventional channels) ⇒ Strip Chart ⇒ DAC / TCG Normalization ⇒ Independent on TCG Angle Gain Compensation / Gain Per Focal Law Correction ⇒ Automatic Coupling Monitor ⇒ Encoded and Time Based Recording ⇒ 100% Raw Data Capturing ⇒ FMC/TFM Protocol for the data acquisition and imaging ⇒ Editable Defects List ⇒ Comprehensive Postrprocessing Including: <ul style="list-style-type: none"> → Recovery and Evaluation of Recorded Cross Sectional Views (Sector Scan / B-Scan) and TOFD A-Scans within Entire Strip Chart → Marking and Sizing Defects, Entering into Defect List within Entire Strip Chart → Exporting Every Desired PA Strip into a Separate C-Scan File → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Views (Sector Scan / B-Scan) and C-Scans for Each Group Inspection → Recovery of Cross Sectional Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude db-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → All Functional TOFD Postrprocessing Including: <ul style="list-style-type: none"> ▷ Off-Line Gain Manipulation ▷ Parabolic Cursors ▷ SAFT ▷ Defects Height / Depth Measurements ▷ Linearization ▷ Straightening ▷ Removal Lateral Wave for Increasing Near Surface Detection Ability ▷ Rectification ▷ Zooming Desired Segments of TOFD Map → Automatic creating of inspection reports - hard copy / PDF File / MS Word File 	SWA 910831

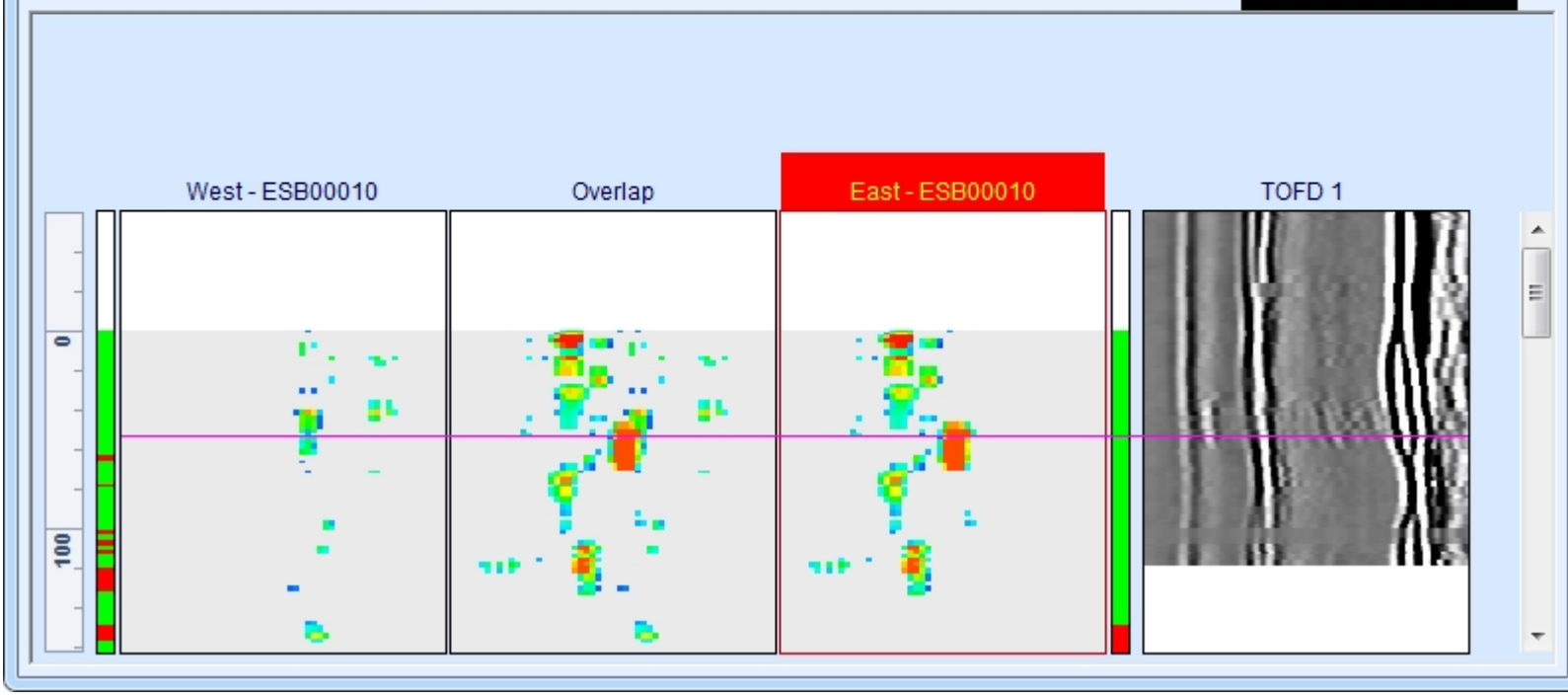
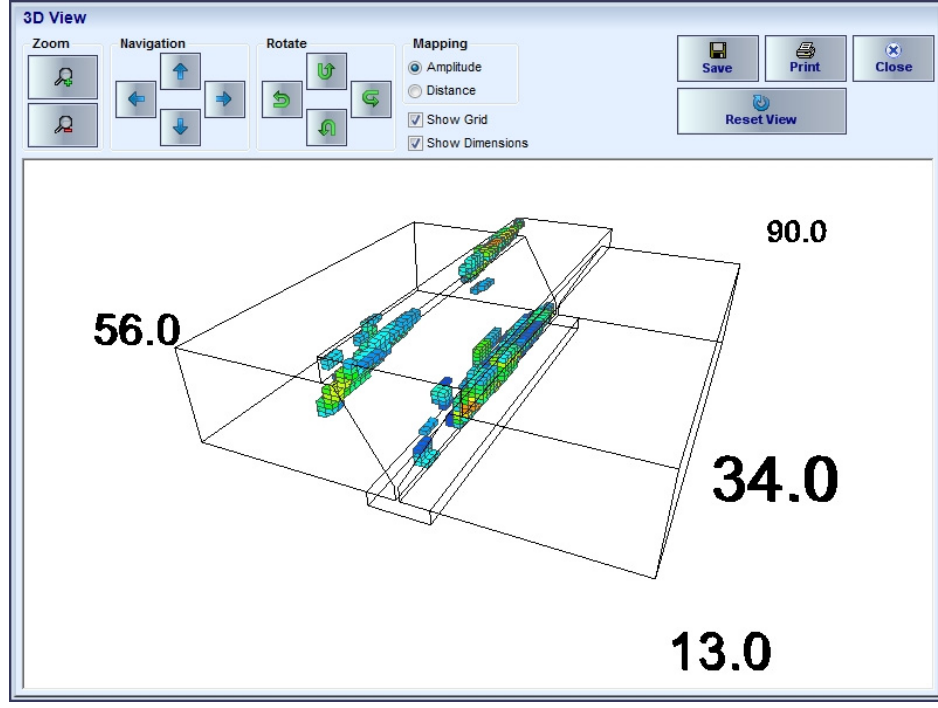
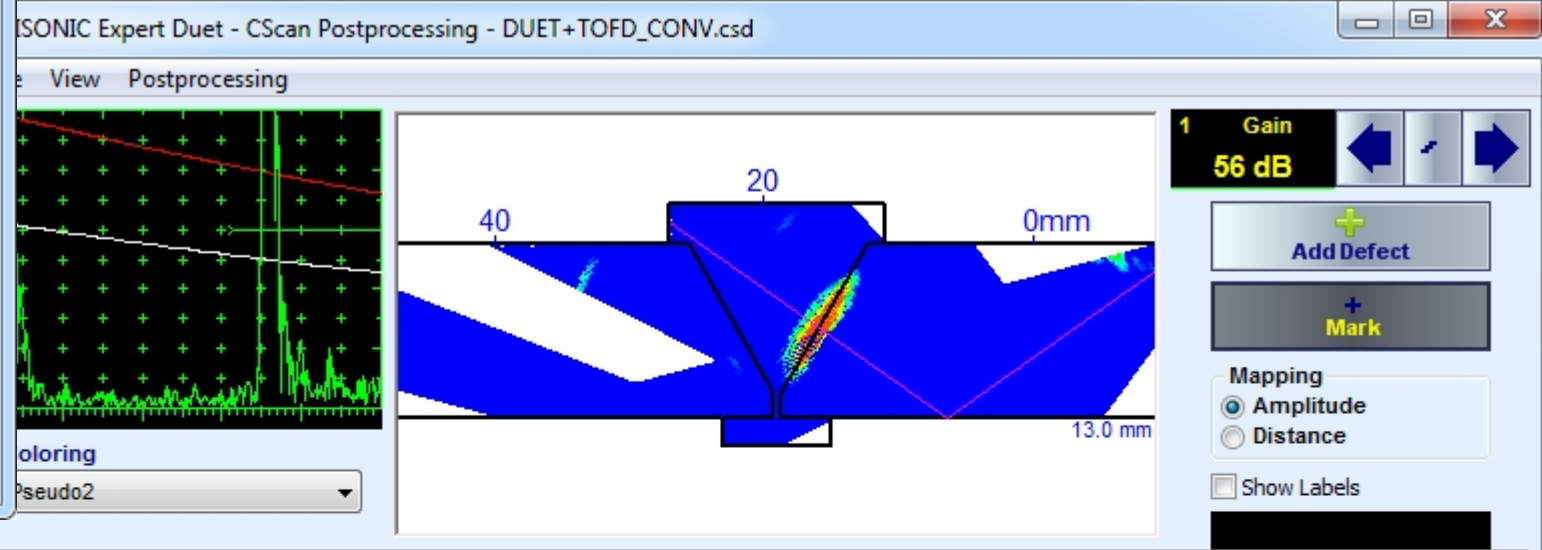
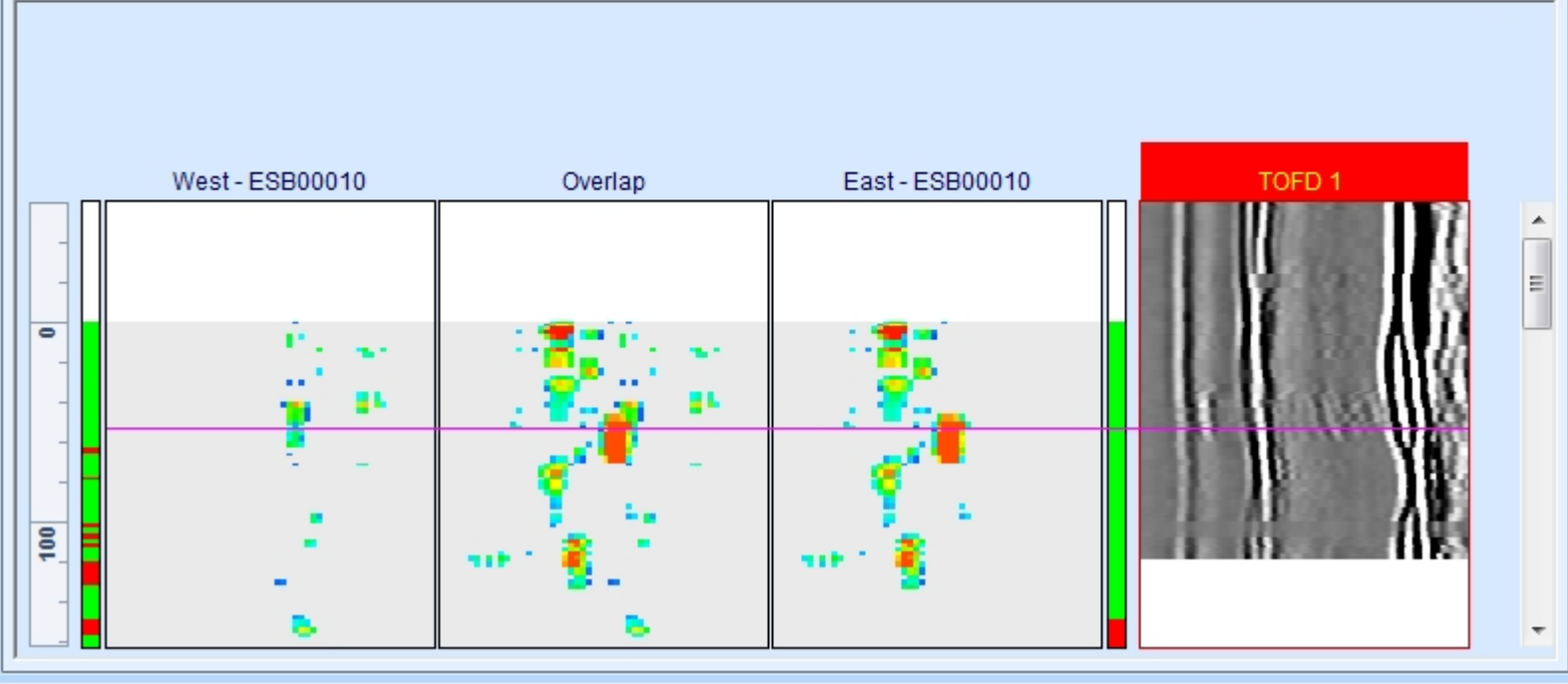
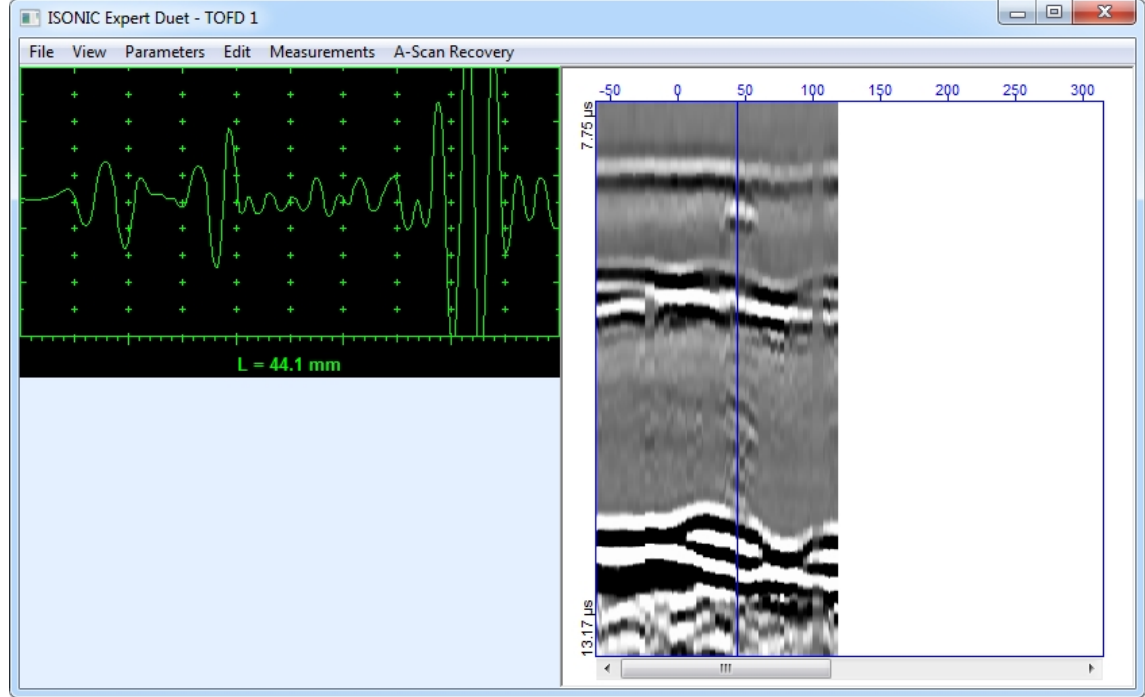
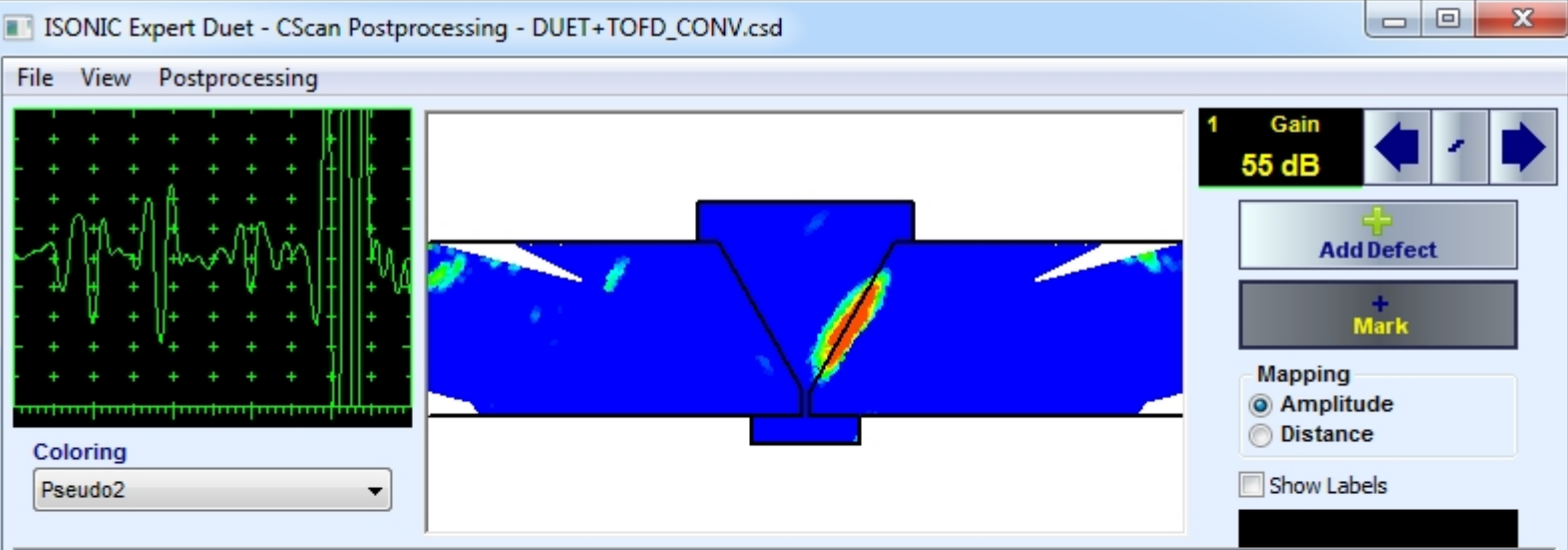


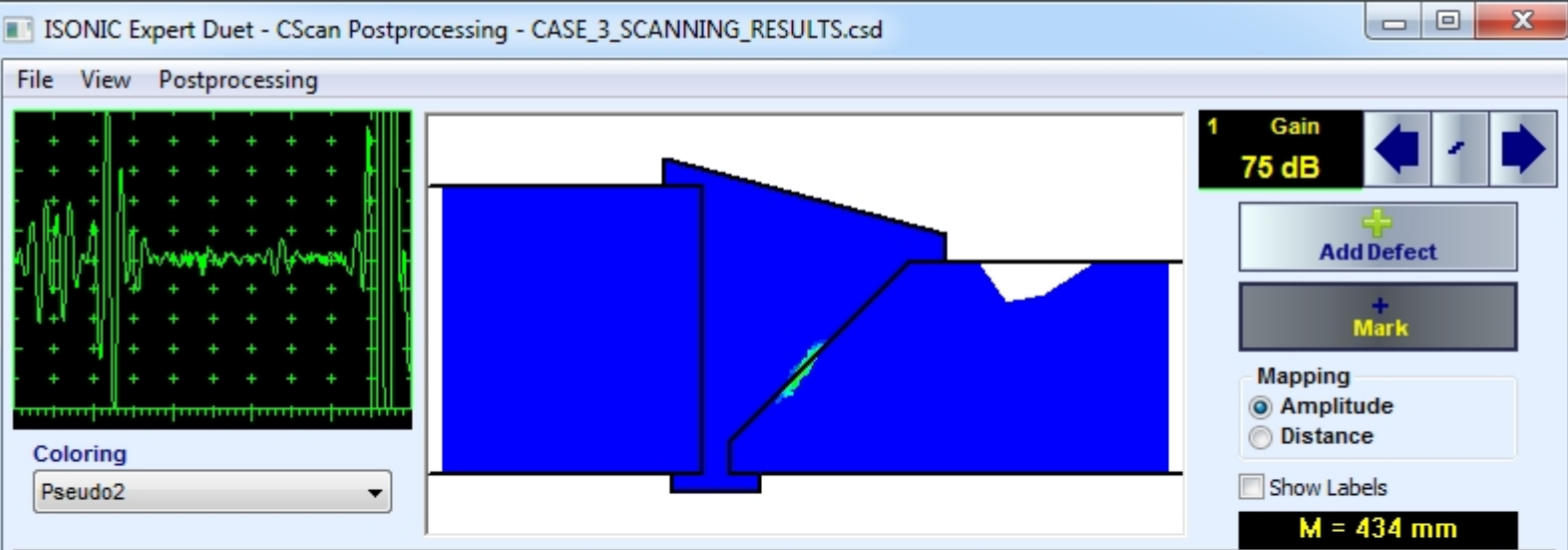
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<p>Inspection SW Application for ISONIC 2009 UPA-Scope - Phased Array Modality: DUET - EXPERT - Inspection of the planar or circumferential butt welds with symmetrical / asymmetrical bevel and longitudinal welds in pipes and pressure vessels using a pair of wedged linear array probes combining sector / linear scan pulse echo and TOFD techniques - strip chart recording and true to geometry imaging</p> <ul style="list-style-type: none"> ⇒ Scanning of Planar / Circumferential Butt Welds / Longitudinal Welds from Both Sides Using Wedged PA Probes ⇒ Multi-Group Cross Sectional Coverage from Both Sides of The Weld - Built-In Intuitive Weld Bevel Coverage Composer ⇒ Sector-Scan, B-Scan (Linear Scan), and Combined Cross Sectional Coverage ⇒ True-To-Geometry Weld Overlay Volume Corrected Imaging - Cross Sectional and Top (C-Scan)- / Side- / End- View and 3D a West- / East- / Both Sides Top View Overlap ⇒ TOFD Insonifications (up to 4) implemented by the Same Pair of Wedged PA Probes (recognized by the international standard EN ISO 13588:2012 and a number of other national and industry codes) ⇒ Strip Chart ⇒ DAC / TCG Normalization ⇒ Independent on TCG Angle Gain Compensation / Gain Per Focal Law Correction ⇒ Automatic Coupling Monitor ⇒ Encoded and Time Based Recording ⇒ 100% Raw Data Capturing ⇒ FMC/TFM Protocol for the data acquisition and imaging ⇒ Editable Defects List ⇒ Comprehensive Postprocessing Including: <ul style="list-style-type: none"> → Recovery and Evaluation of Recorded Cross Sectional Views (Sector Scan / B-Scan) and TOFD A-Scans within Entire Strip Chart → Marking and Sizing Defects, Entering into Defect List within Entire Strip Chart → Exporting Every Desired PA Strip into a Separate C-Scan File → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Views (Sector Scan / B-Scan) and C-Scans for Each Group Inspection → Recovery of Cross Sectional Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude db-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → All Functional TOFD Postprocessing Including: <ul style="list-style-type: none"> ▷ Off-Line Gain Manipulation ▷ Parabolic Cursors ▷ SAFT ▷ Defects Height / Depth Measurements ▷ Linearization ▷ Straightening ▷ Removal Lateral Wave for Increasing Near Surface Detection Ability ▷ Rectification ▷ Zooming Desired Segments of TOFD Map → Automatic creating of inspection reports - hard copy / PDF File / MS Word File 	SWA 909826



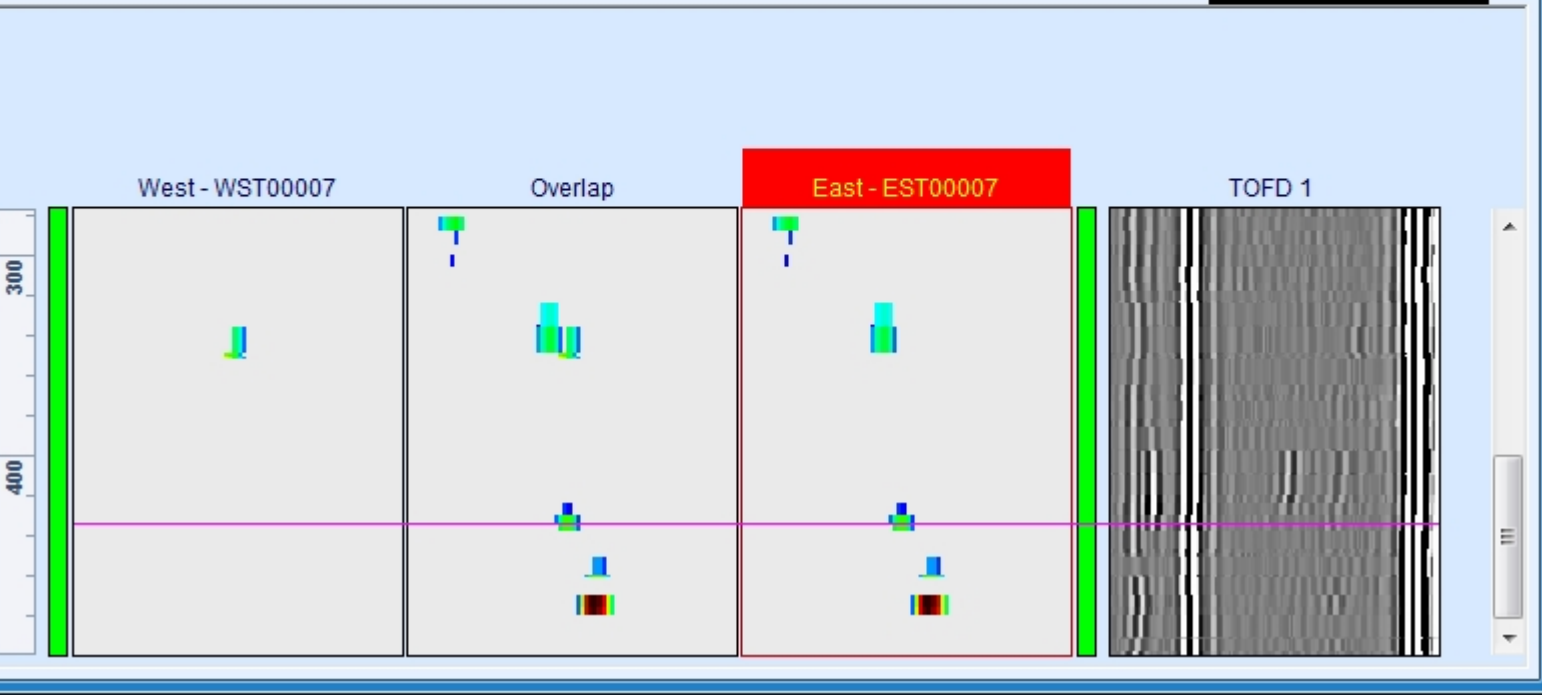
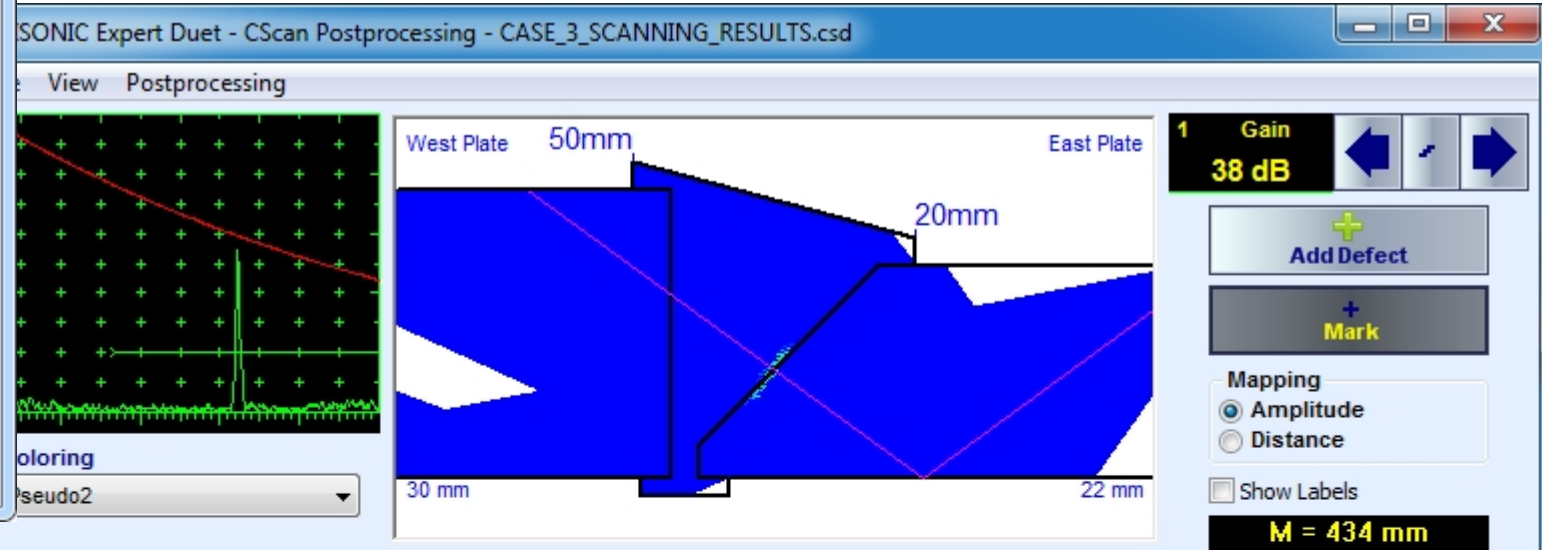
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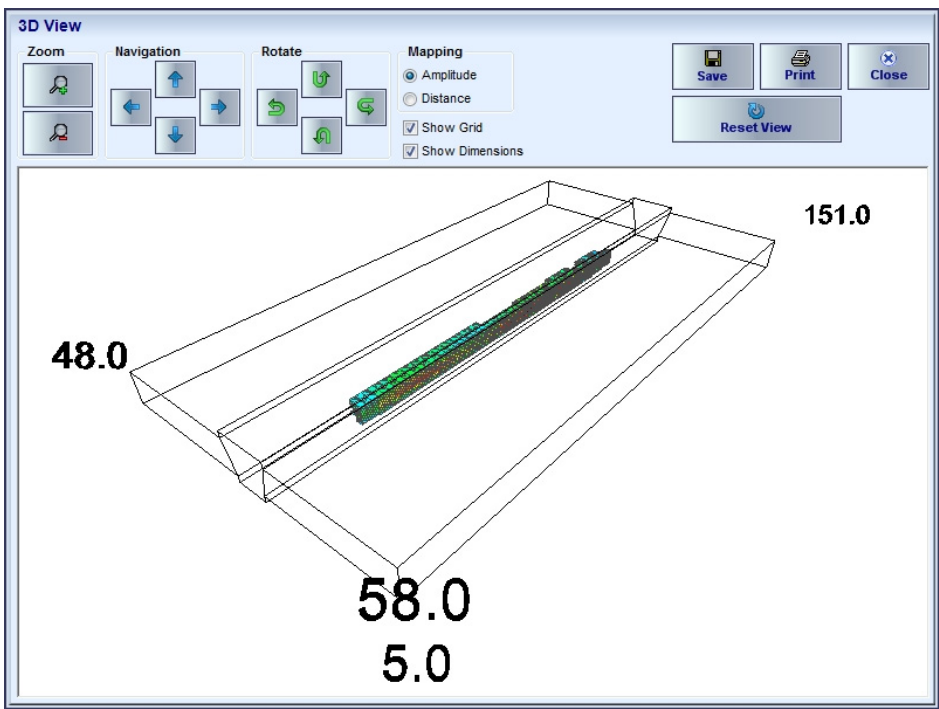
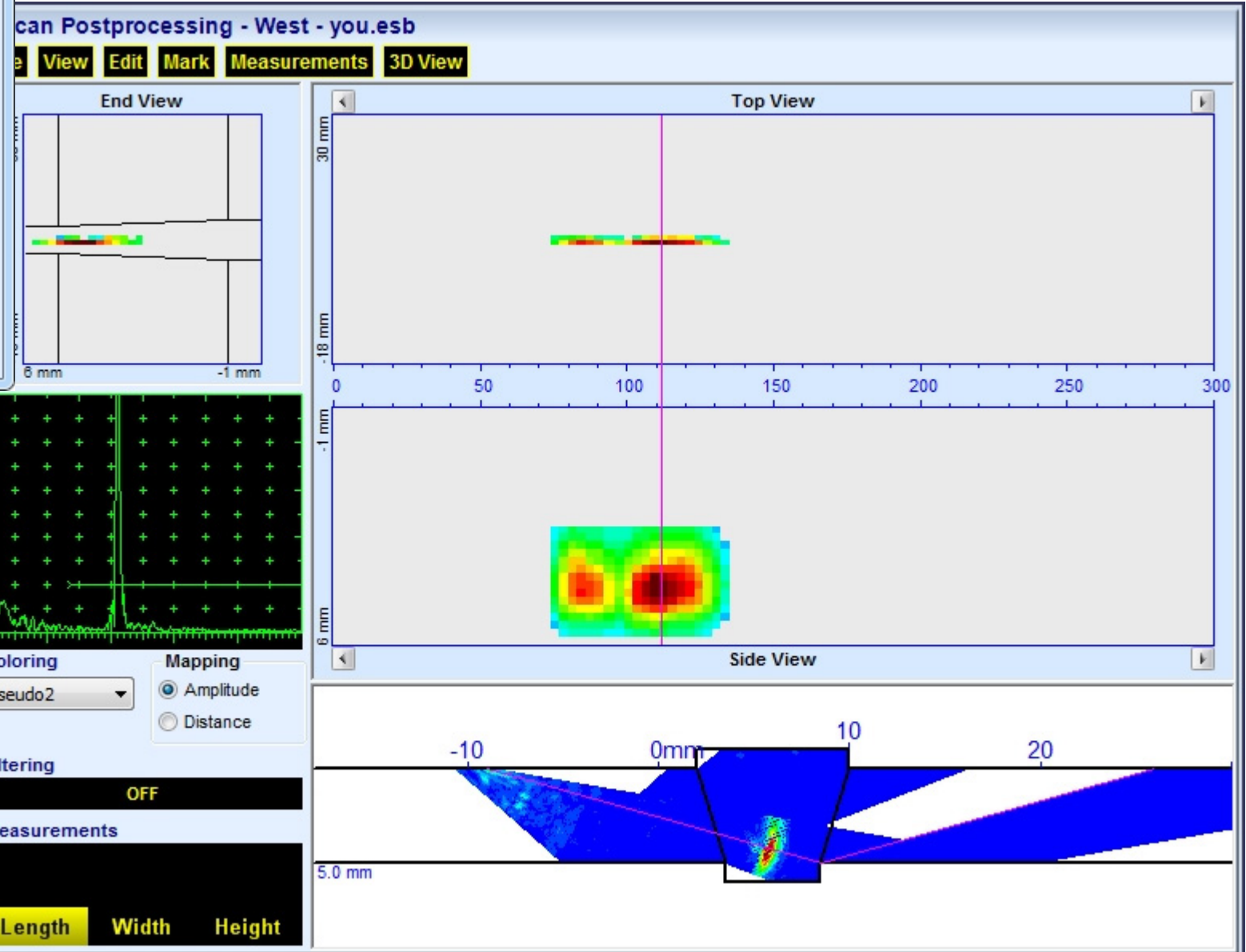
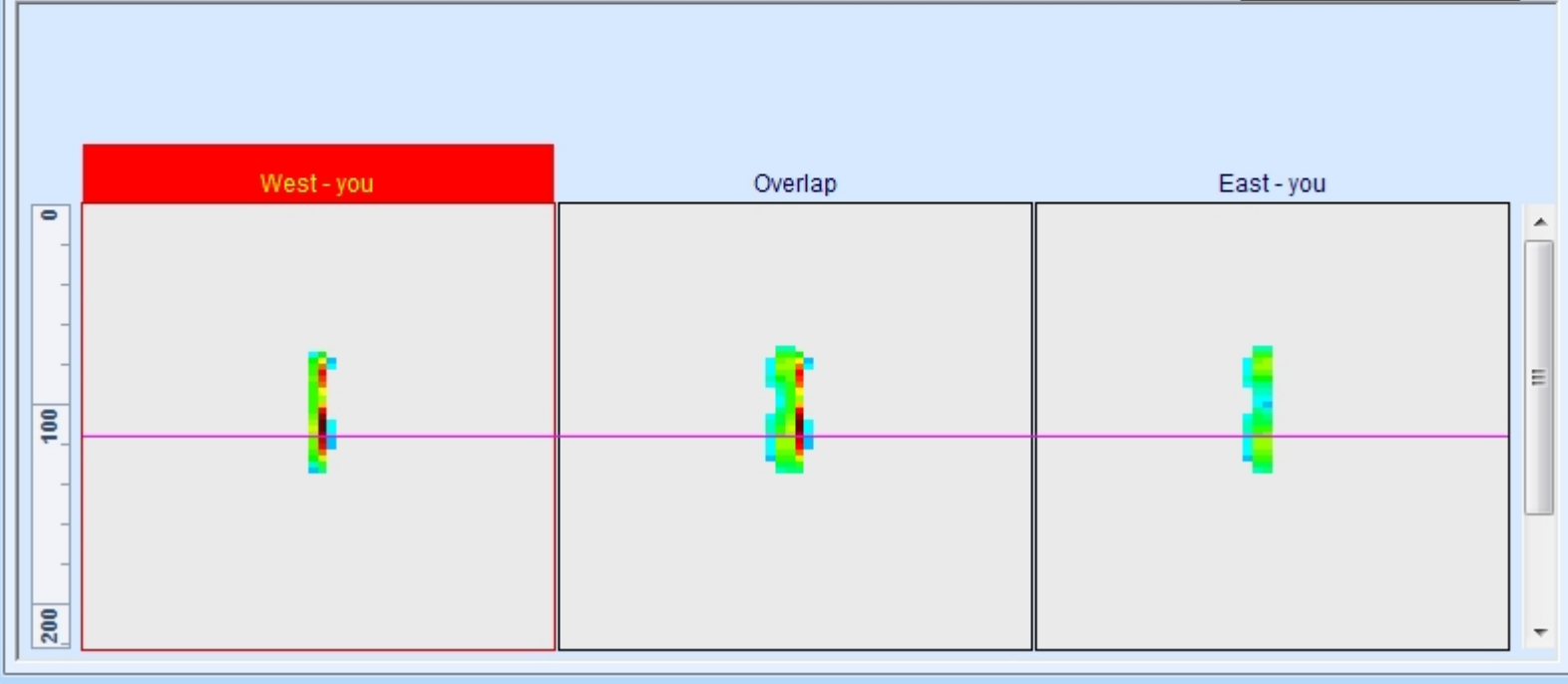
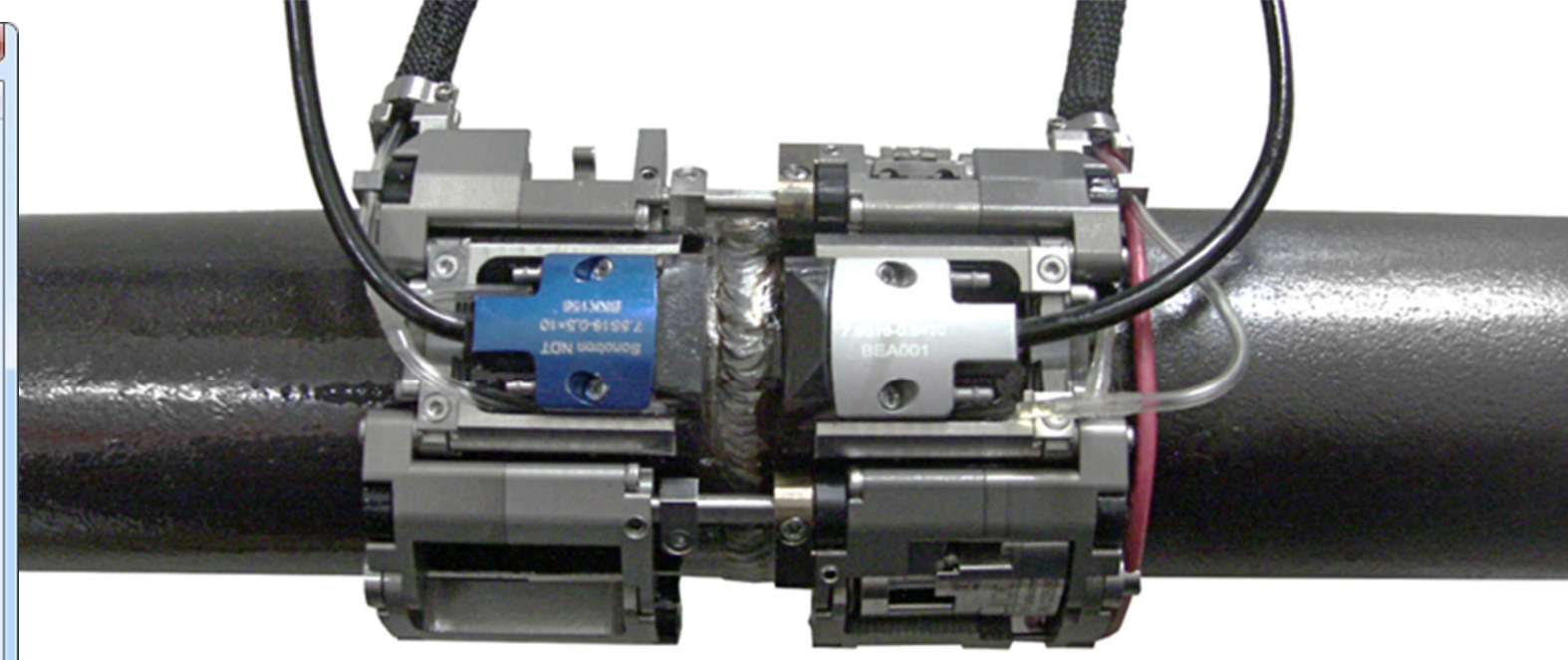
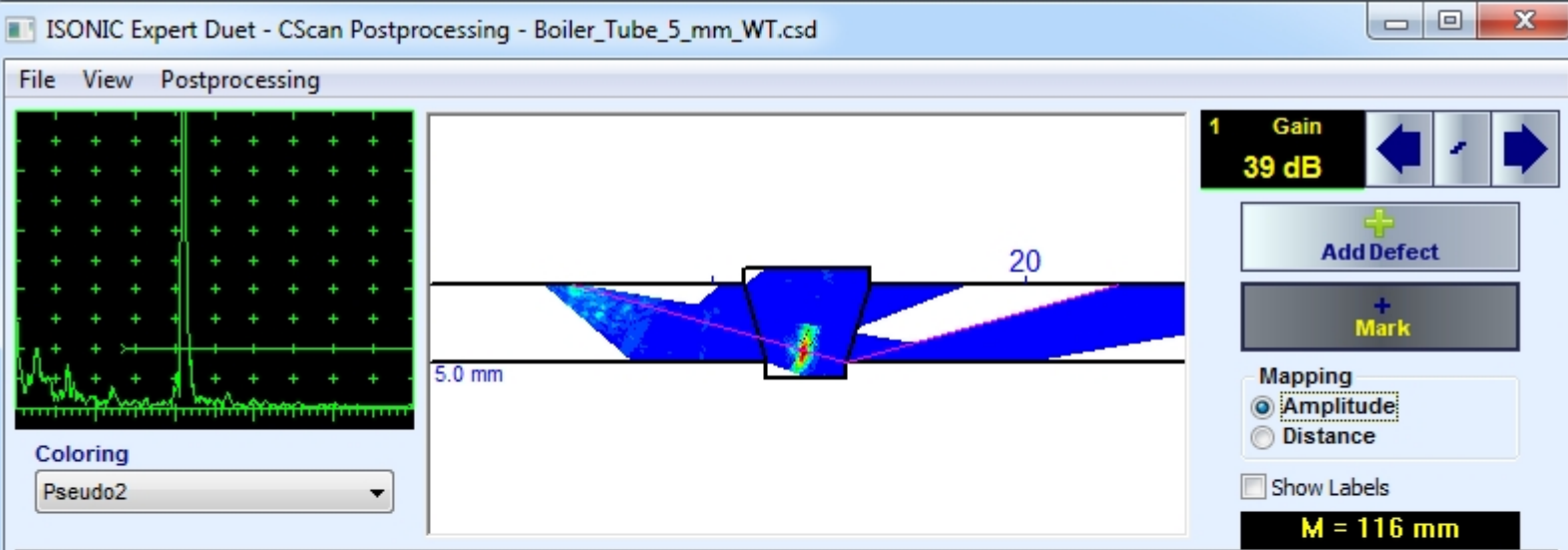


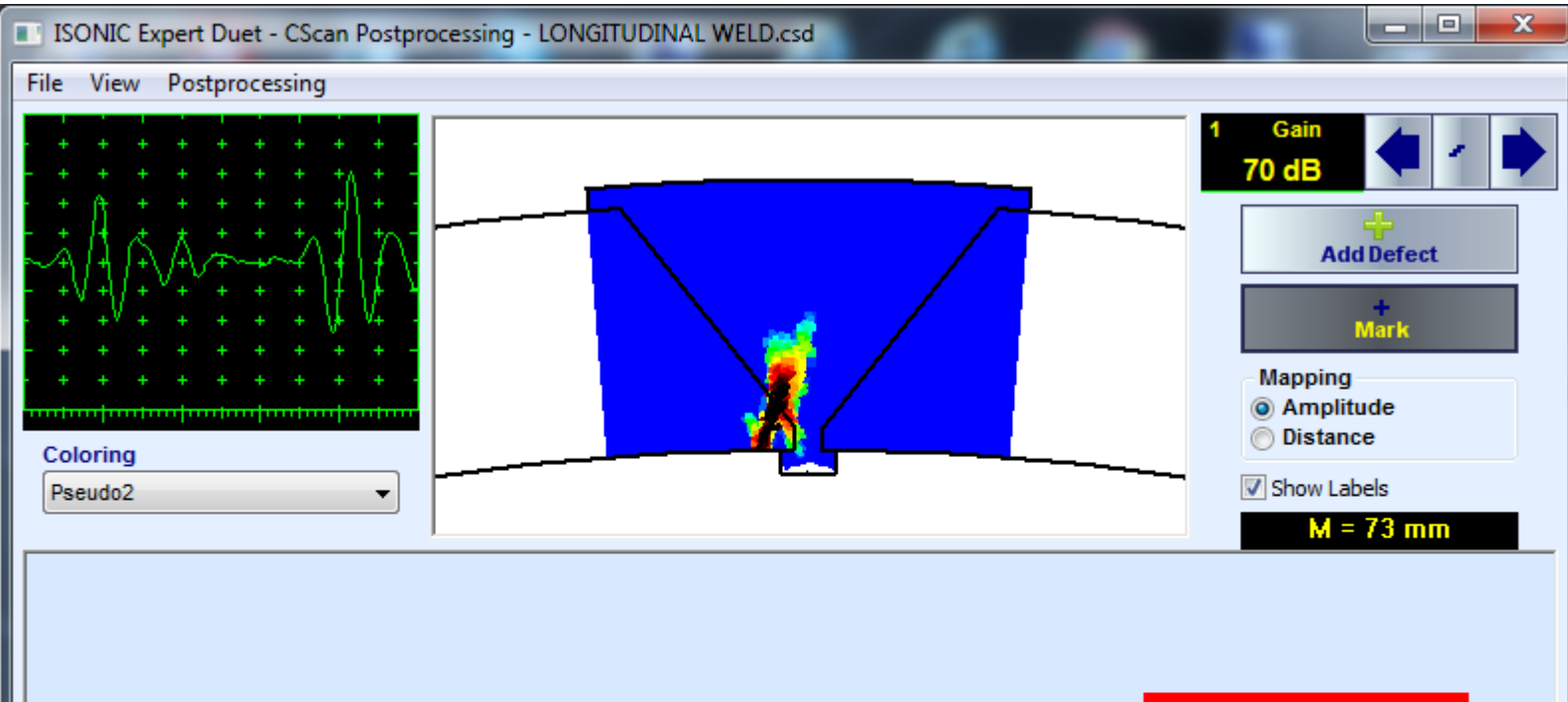




Transition Weld







Longitudinal Weld

