Multi-Finger Caliper tools provide direct, accurate and reliable measurements of internal tubing and casing diameters. Used in both drilling and production environments, applications include the evaluation of corrosion, erosion, wear, bending, buckling, pits, holes and other defects with high accuracy.

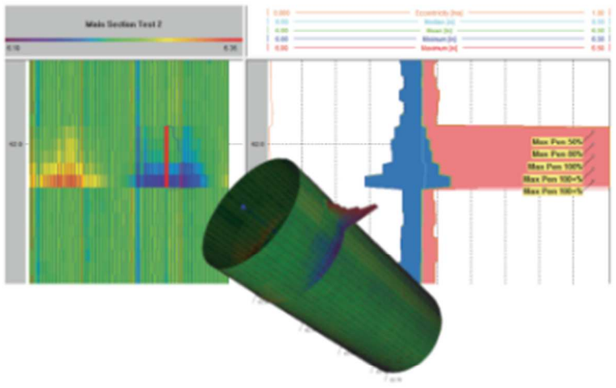
MFC24C-H MFC40C-B MFC56C-G

Measuring fingers move radially along the inner casing or tubing wall, detecting any diameter change. This produces a high resolution record of the tubular geometry which can be viewed and presented as a conventional log, a cross section, or a 3-D color enhanced image.

The Multi-Finger Caliper may also be used to measure the buildup of scale, paraffin or other mineral deposits in the wellbore. Auxiliary measurements include an integral well-bore temperature probe, along with deviation and relative bearing information. A range of instrument diameters with different finger arrays are available to provide optimized measurements in tubulars ranging from 2-3/8 in. to 20 in. diameter.

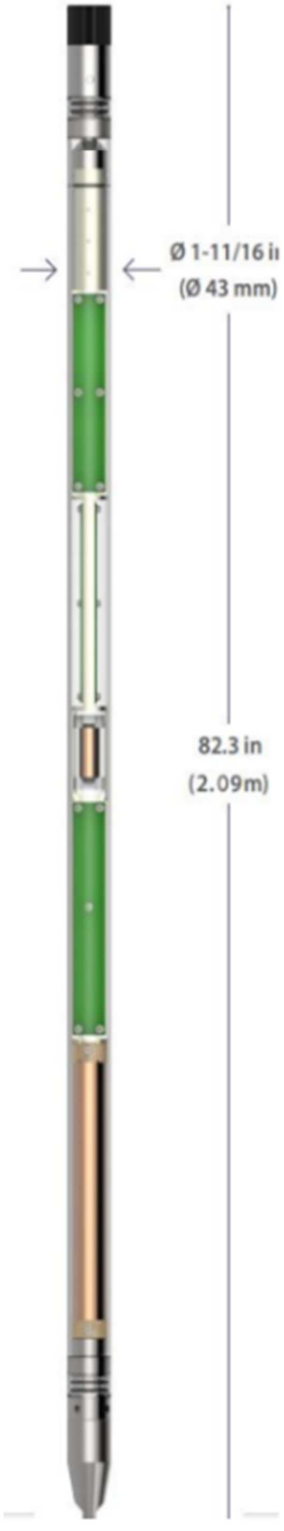
APPLICATIONS & FEATURES

- Available in 24, 40, and 56 fingers
- Extended fingers available
- Combinable with all Pegasus Series Tools
- Compatible with PegasusStar Cased Hole Logging Platform
- Has Built-in Wellbore Temperature and 3-axis accelerometer able to provide crucial information about the Well Conditions including: Temperature, Deviation and Finger position
- ViewWell™ Compatible for analysis and reporting

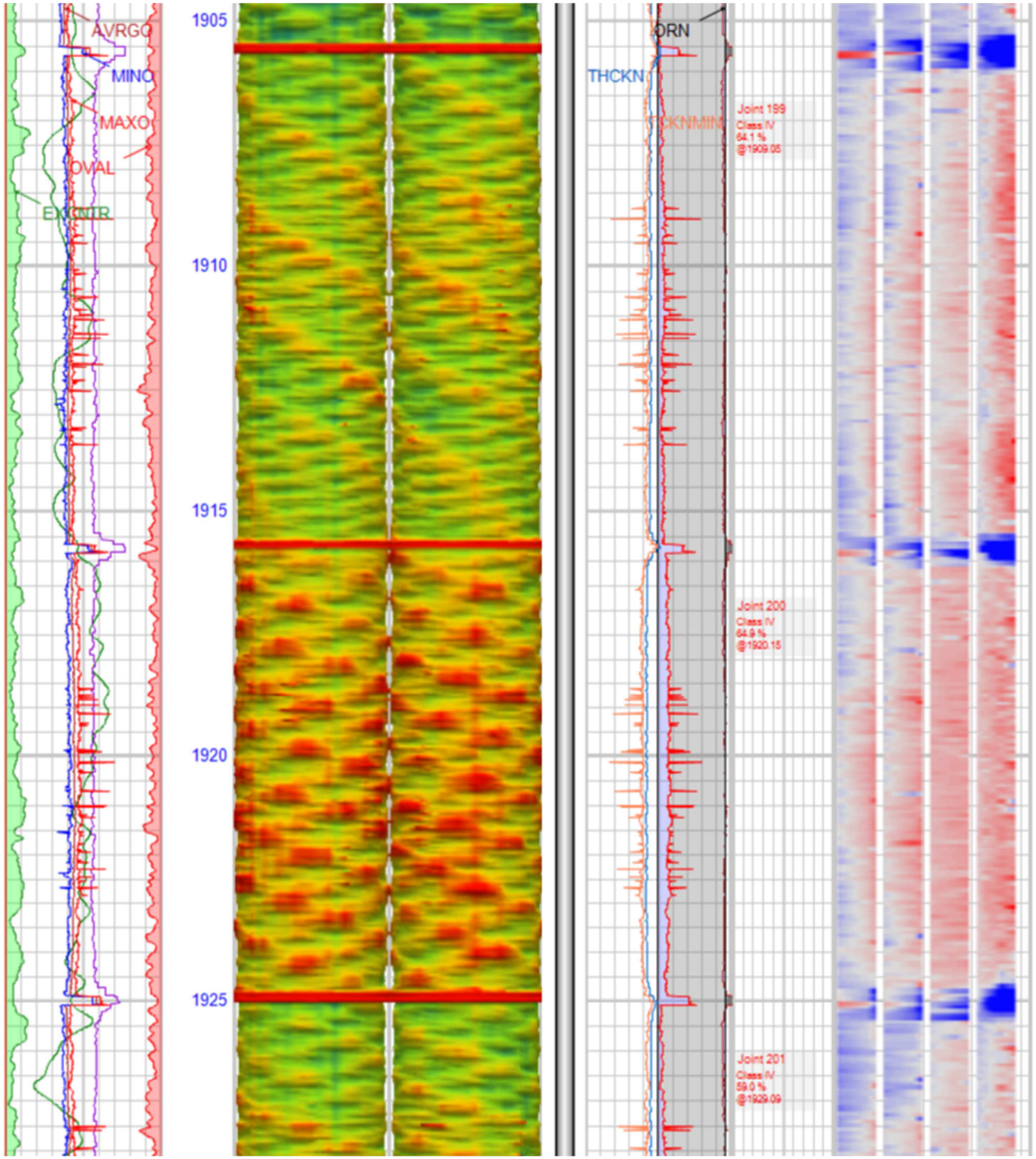


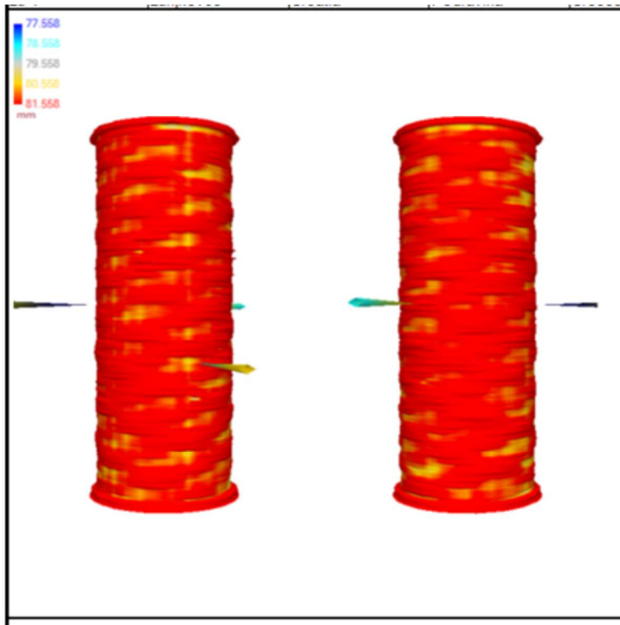
MFC 3D VIEW

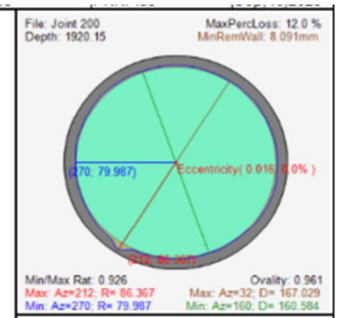
		MFC24 C-H	MFC40C-B	MFC56C-G
GENERAL SPECS		**P/N 1.01.03.300003661**	**P/N 1.01.03.100520911**	**P/N 1.01.03.100520561**
Maximum Pressure			14503 PSI (100 Mpa)	
Maximum Temperature			347 °F (175 °C)	
Diameter		1.69 in. (43 mm)	2.87 in. (73 mm)	3.54 in. (90 mm)
Makeup Length		69.25 in. (1.759 m)	77.95 in. (1.98 m)	81.85 in.(2.079 m)
Shipping Length				
Weight		26.46 lbs (12kg)	79.4 lbs (35.5kg)	112.4 lbs (51kg)
Max Tensile Strength			10000lbf	
Material			17-4 SS & Al-Bronze	
EXTENDED FINGER				
Extended Finger		XF (Same OD)	EF kit (Bigger OD)	
CALIPER MEASUREMENT				
Number of arms		24 arms	40 arms	56 arms
STD	Minimum, Diameter	2 in. (51 mm)	3.5 in. (89 mm)	4 in. (101.6 mm)
	Maximum, Diameter	7 in. (178 mm)	8-1/4 in. (209.6 mm)	9-5/8 in. (244.5 mm)
	Accuracy, Radial	±0.02 in. (0.5 mm)	±0.02 in. (0.5 mm)	±0.02 in. (0. mm)
	Resolution	0.0039 in (0.1mm)	0.0039 in (0.1mm)	0.0039 in (0.1mm)
	Caliper Measure Point	33.92 in.	27.63 In.	29.17 In.
EF/XF	Minimum, Diameter	2 in. (51 mm)	5 in. (127 mm)	7.5 in. (190.4 mm)
	Maximum, Diameter	9-5/8 in. (244.5 mm)	9-5/8 in. (244.5 mm)	13-3/8 in. (340 mm)
	Accuracy, Radial	±0.035 in. (0.89 mm)	±0.035 in. (0.89 mm)	±0.035 in. (0.89 mm)
	Resolution	0.005 in (0.13mm)	0.005 in (0.13mm)	0.005 in (0.13mm)
	Caliper Measure Point	36.97 in	27.33 in	27.31 in
EXF	Minimum, Diameter	N/A		8.35 in. (212.2 mm)
	Maximum, Diameter			20 in. (508 mm)
	Accuracy, Radial			±0.045 in. (1.14 mm)
	Resolution			0.005 in (0.13mm)
	Caliper Measure Point			23.56in.
Sensor type		Linear Displacement sensor		
WELLBORE TEMPERATURE MEASUREMENT				
Minimum		N/A	13° F (-25° C)	
Maximum			347 °F (175°C)	
Accuracy			± 2° C	
INCLINATION MEASUREMENT				
Minimum		0°		
Maximum		180°		
Accuracy		±5.0°		
RELATIVE AZIMUTH MEASUREMENT				
Minimum		0°		
Maximum		360°		
Accuracy		±5.0° (Dev≥5.0°)		
VERTICAL RESOLUTION				
Typical Logging Speed Vertical Resolution @ 600m/h		30 ft/min (9.14 m/min) 0.12 in. (3.05mm)		
BUILDIN CENTRALIZER				
Buildin Centralizer		Lower	Upper/Lower	

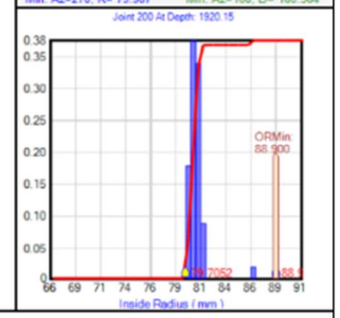


Name	Specifications
General	
Working Temperature	0°C～175°C (32°F～347°F)/2hr
Working Pressure	≤100MPa(14,503 psi)
Working Voltage	90VDC±10%
Working Current	60mA～130mA
OD	φ43mm(1.69″)
Shipping Length	2253.5mm（88.72″）
Make-up Length	2088.5 mm（82.22″）
Weight	9kg
Max. Logging Speed	300 m/h (16 ft/min)
Pipe String Measuring Range	60mm～324mm（2.362″～12.756″）
Single Pipe Measurement	
Pipe Wall Thickness	≤12mm (0.4724″)
Measurement Error	±0.5mm(0.0197″)
Resolution	0.15mm (0.0059″)
Double Pipe Measurement	
Pipe Wall Thickness	≤25mm (0.984″)
Measurement Error	±1.5mm(0.059″)
Resolution	0.3mm (0.0118″)
Temperature Measurement	
Measurement Range	0~175°C
Sensitivity	0.01°C
Accuracy	±1°C









Interpretation Remarks:

The 3D image was taken from camera at depth position of 1920.41, distance from the borehole center of 886.25 mm. The left 3D image is the joint as it looks from relative azimuth of 0 (North) degrees. The right 3D image is the joint as it looks from relative azimuth of 180 (South) degrees. Only inside pipe wall is shown at the images. Color coding at the image shows cyan for radius reduced then medium selected value of 79.558 mm which is light gray, and golden coloring marks radius points which are higher than medium selected value. Medium default value is by default selected to be the nominal inside radius for inside pipe wall and nominal outside radius for outside pipe wall. However the interpreter may change this in order to best stress the pipe diameter changes.

If shown the blue-yellow marker pointer indicates interpreter selected feature at the 3D image, or the depth of highest pipe damage by default.

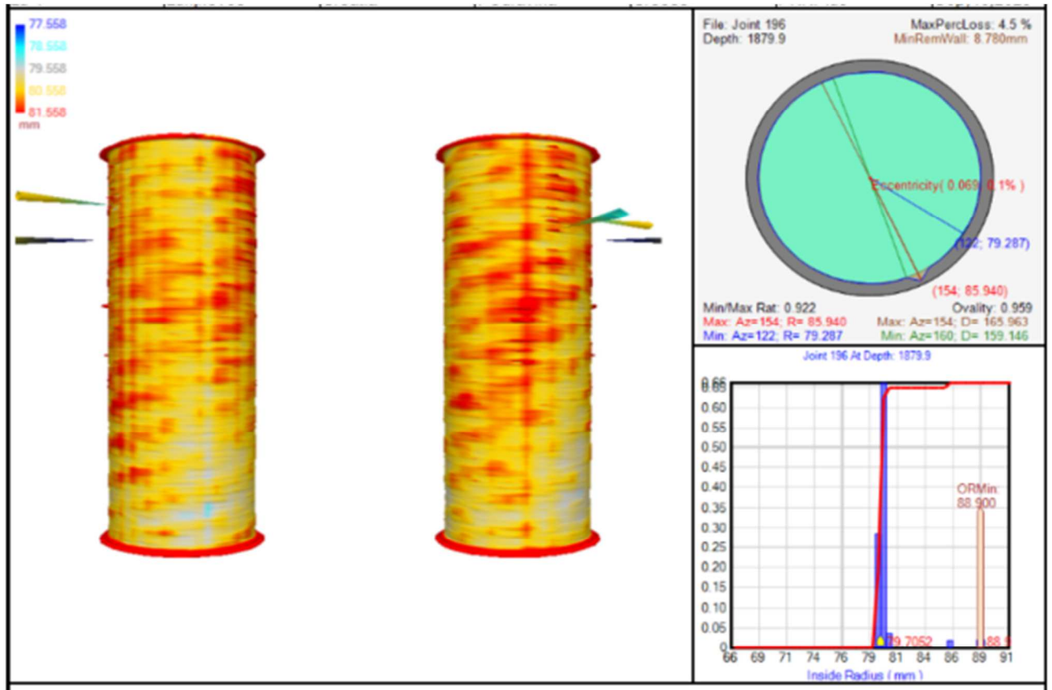
Marker Point (golden-blue marker):

- Depth: 1,920.15
- Azimuth: 90.00
- Radius: 81.1226

Borehole cross section image as well as interpretation histogram are taken from the same marker selected depth. The details regarding the ovality, eccentricity, direction of max damage measured inside and outside diameters for the selected point can be found at above cross-section and histogram images.

Joint No.	Top meter	Bottom meter	Length meter	Max. Burst Pres. psi	Avrg. Burst Pres. psi	Min. Burst Pres. psi	Corrosion Profile 7 Inch	Min. Coll. Pres. psi	Avrg. Coll. Pres. psi	Max. Coll. Pres. psi	Min. Collapse Depth meter
Joint 166	1590.87	1599.17	8.30	4978	4908	4846		4103	4208	4327	1595.14
Joint 167	1599.17	1607.00	7.83	5024	4930	4867		4138	4245	4406	1606.14
Joint 168	1607.00	1616.95	9.95	5098	4888	4799		4021	4173	4533	1614.82
Joint 169	1616.95	1626.93	9.98	5079	4925	4853		4123	4236	4499	1620.16
Joint 170	1626.93	1636.43	9.50	5053	4886	4782		3993	4170	4455	1634.30
Joint 171	1636.43	1646.69	10.26	5093	4945	4856		4118	4270	4523	1638.95
Joint 172	1646.69	1656.84	10.15	5083	4930	4794		4013	4245	4506	1648.05
Joint 173	1656.84	1665.73	8.89	5086	4928	4822		4060	4241	4512	1657.57
Joint 174	1665.73	1675.68	9.95	5051	4947	4829		4072	4275	4452	1671.74
Eq. 1	1675.68	1676.58	0.90	7864	7830	7718	Eq.	8113	8221	8253	1675.98
Joint 175	1676.58	1686.19	9.61	5198	4924	4825		4066	4234	4703	1678.53
Joint 176	1686.19	1695.99	9.80	5105	4949	4886		4169	4278	4544	1689.22
Joint 177	1695.99	1706.25	10.26	5073	4942	4859		4123	4267	4489	1699.00
Joint 178	1706.25	1714.91	8.66	4936	4785	4716		3880	3998	4256	1709.79
Joint 179	1714.91	1724.85	9.94	5025	4902	4809		4038	4198	4408	1723.74
Joint 180	1724.85	1734.97	10.12	5115	4933	4847	II	4104	4250	4562	1728.89
Joint 181	1734.97	1744.98	10.01	4983	4829	4760	II	3956	4073	4336	1739.13
Joint 182	1744.98	1753.58	8.60	4838	4766	4653	II	3772	3966	4088	1750.28
Joint 183	1753.58	1762.68	9.10	5053	4867	4791	II	4008	4137	4455	1761.38
Joint 184	1762.68	1771.94	9.26	5182	4862	4753	II	3943	4129	4675	1769.76
Joint 185	1771.94	1781.68	9.74	5020	4839	4737	II	3915	4089	4400	1780.94
Joint 186	1781.68	1791.25	9.57	4907	4826	4743	II	3925	4068	4207	1790.08
Joint 187	1791.25	1800.67	9.42	4945	4812	4702	IV	3856	4043	4270	1796.71
Joint 188	1800.67	1809.38	8.71	4903	4771	4702	IV	3855	3974	4200	1808.60
Joint 189	1809.38	1819.63	10.25	4957	4735	4664	IV	3790	3913	4292	1811.09
Joint 190	1819.63	1829.11	9.48	4929	4739	4672	II	3804	3920	4244	1824.42
Joint 191	1829.11	1839.16	10.05	4801	4694	4623	II	3729	3842	4024	1832.73
Joint 192	1839.16	1849.05	9.89	4832	4736	4632	III	3737	3913	4077	1841.57
Joint 193	1849.05	1859.11	10.06	4848	4742	4683	II	3832	3923	4106	1853.25
Joint 194	1859.11	1868.06	8.95	4975	4789	4736	III	3913	4004	4322	1860.82
Joint 195	1868.06	1877.91	9.85	5049	4803	4733	IV	3909	4028	4448	1876.65
Joint 196	1877.91	1886.89	8.98	4903	4819	4753	IV	3943	4055	4200	1882.64
Joint 197	1886.89	1896.17	9.28	4898	4685	4621	IV	3717	3826	4191	1888.48
Joint 198	1896.17	1905.65	9.48	4960	4739	4665	IV	3792	3919	4297	1901.00
Joint 199	1905.65	1915.79	10.14	4952	4733	4656	IV	3777	3908	4282	1914.19
Joint 200	1915.79	1925.03	9.24	4594	4462	4380	IV	3305	3445	3671	1917.84
Joint 201	1925.03	1932.47	7.44	4908	4759	4686	IV	3828	3954	4208	1928.18

Table 8. Joints (7 Inch) WIPP3D Burst/Collapse Pressure Profile Report.



Interpretation Remarks:

The 3D image was taken from camera at depth position of 1882.40, distance from the borehole center of 886.25 mm. The left 3D image is the joint as it looks from relative azimuth of 0 (North) degrees. The right 3D image is the joint as it looks from relative azimuth of 180 (South) degrees. Only inside pipe wall is shown at the images. Color coding at the image shows cyan for radius reduced then medium selected value of 79.558 mm which is light gray, and golden coloring marks radius points which are higher than medium selected value. Medium default value is by default selected to be the nominal inside radius for inside pipe wall and nominal outside radius for outside pipe wall. However the interpreter may change this in order to best stress the pipe diameter changes.
If shown the blue-yellow marker pointer indicates interpreter selected feature at the 3D image, or the depth of highest pipe damage by default.

Marker Point (golden-blue marker):
- Depth: 1,879.90
- Azimuth: 90.00
- Radius: 80.0936

Borehole cross section image as well as interpretation histogram are taken from the same marker selected depth. The details regarding the ovality, eccentricity, direction of max damage measured inside and outside diameters for the selected point can be found at above cross-section and histogram images.