

Voorhaar Stress Engineering

EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

Time: 11:25:56

Project: VARIOUS CALCULATIONS

Jobnr: PV2021

ABSTRACT:



REFERENCES:

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63	B	For review					
64	C	Authorized for construction					
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Scope of calculation

Calculation according to the Dutch Rules for Pressure Vessels (RToD)



Actual dimensions of calculated pipes and pipelines

21.336 mm	x	3.734 mm	Seamless pipe ANSI B16.10
26.670 mm	x	3.912 mm	Seamless pipe ANSI B16.10
33.401 mm	x	4.547 mm	Seamless pipe ANSI B16.10
48.260 mm	x	7.137 mm	Seamless pipe ANSI B16.10
60.325 mm	x	8.738 mm	Seamless pipe ANSI B16.10
88.900 mm	x	11.125 mm	Seamless pipe ANSI B16.10
114.300 mm	x	11.125 mm	Seamless pipe ANSI B16.10
168.275 mm	x	18.263 mm	Seamless pipe ANSI B16.10
219.075 mm	x	20.625 mm	Seamless pipe ANSI B16.10
273.050 mm	x	25.400 mm	Seamless pipe ANSI B16.10
323.850 mm	x	28.575 mm	Seamless pipe ANSI B16.10
355.600 mm	x	31.750 mm	Seamless pipe ANSI B16.10
457.200 mm	x	39.675 mm	Seamless pipe ANSI B16.10

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CALCULATION OF PIPES UNDER INTERNAL PRESSURE ACC. TO STW D0201

110.500 bar - -3.00 C 110.500 bar - 515.00 C



Flange-rating according to ANSI B16.5 material group 1.9 - 2500#

431.0 bar -	-29 C	431.0 bar -	38 C	426.2 bar -	50 C
406.4 bar -	100 C	386.4 bar -	150 C	379.0 bar -	200 C
370.6 bar -	250 C	353.5 bar -	300 C	335.3 bar -	350 C
323.4 bar -	375 C	304.9 bar -	400 C	292.5 bar -	425 C
281.7 bar -	450 C	263.8 bar -	475 C	231.6 bar -	500 C
168.9 bar -	525 C	131.4 bar -	540 C	106.4 bar -	550 C
70.8 bar -	575 C	49.0 bar -	600 C	28.2 bar -	625 C
19.3 bar -	650 C	0.0 bar -	675 C	0.0 bar -	700 C
0.0 bar -	725 C	0.0 bar -	750 C	0.0 bar -	775 C
0.0 bar -	800 C				

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 21.34 mm
 Nominal wallthickness : 3.734 mm SCHED_80
 Tolerance : 0.467 mm See D0101 par.3.4

MATERIAL

: ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 1.507 mm
 d = dd-tol-corr : 2.267 mm
 z min : 0.6393

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 17.2852 N/mm²

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CALCULATION OF PIPES UNDER INTERNAL PRESSURE ACC. TO STW D0201

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 26.67 mm
 Nominal wallthickness : 3.912 mm SCHED_80
 Tolerance : 0.489 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 1.884 mm
 d = dd-tol-corr : 2.423 mm
 z min : 0.7607

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 14.5265 N/mm²

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Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 33.40 mm
 Nominal wallthickness : 4.547 mm SCHED_80
 Tolerance : 0.568 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 2.359 mm
 d = dd-tol-corr : 2.978 mm
 z min : 0.7764

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 14.2332 N/mm²

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CALCULATION OF PIPES UNDER INTERNAL PRESSURE ACC. TO STW D0201

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 48.26 mm
 Nominal wallthickness : 5.080 mm SCHED_80
 Tolerance : 0.635 mm See D0101 par.3.4

MATERIAL

: ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 3.409 mm
 d = dd-tol-corr : 3.445 mm
 z min : 0.9887

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.1764 N/mm²

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 60.33 mm
 Nominal wallthickness : 8.738 mm SCHED_160
 Tolerance : 1.092 mm See D0101 par.3.4

MATERIAL

: ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 4.261 mm
 d = dd-tol-corr : 6.645 mm
 z min : 0.6139

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 17.9989 N/mm²

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CALCULATION OF PIPES UNDER INTERNAL PRESSURE ACC. TO STW D0201

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 88.90 mm
 Nominal wallthickness : 11.125 mm SCHED_160
 Tolerance : 1.391 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 6.279 mm
 d = dd-tol-corr : 8.735 mm
 z min : 0.6975

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 15.8412 N/mm²

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Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 114.30 mm
 Nominal wallthickness : 11.125 mm SCHED_120
 Tolerance : 1.391 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 8.073 mm
 d = dd-tol-corr : 8.735 mm
 z min : 0.9186

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 12.0297 N/mm²

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CALCULATION OF PIPES UNDER INTERNAL PRESSURE ACC. TO STW D0201

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 168.27 mm
 Nominal wallthickness : 18.263 mm SCHED_160
 Tolerance : 2.283 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 11.886 mm
 d = dd-tol-corr : 14.980 mm
 z min : 0.7778

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 14.2073 N/mm²

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 219.07 mm
 Nominal wallthickness : 20.625 mm SCHED_140
 Tolerance : 2.578 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 15.474 mm
 d = dd-tol-corr : 17.047 mm
 z min : 0.9007

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 12.2677 N/mm²

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CALCULATION OF PIPES UNDER INTERNAL PRESSURE ACC. TO STW D0201

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 273.05 mm
 Nominal wallthickness : 25.400 mm SCHED_140
 Tolerance : 3.175 mm See D0101 par.3.4

MATERIAL

: ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 19.287 mm
 d = dd-tol-corr : 21.225 mm
 z min : 0.9017

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 12.2542 N/mm²

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Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 323.85 mm
 Nominal wallthickness : 28.575 mm SCHED_140
 Tolerance : 3.572 mm See D0101 par.3.4

MATERIAL

: ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 22.875 mm
 d = dd-tol-corr : 24.003 mm
 z min : 0.9494

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.6387 N/mm²

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CALCULATION OF PIPES UNDER INTERNAL PRESSURE ACC. TO STW D0201

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 355.60 mm
 Nominal wallthickness : 31.750 mm SCHED_140
 Tolerance : 3.969 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 25.117 mm
 d = dd-tol-corr : 26.781 mm
 z min : 0.9332

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.8416 N/mm²

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 457.20 mm
 Nominal wallthickness : 39.675 mm SCHED_140
 Tolerance : 4.959 mm See D0101 par.3.4

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo
 Ansi B16.10 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 32.294 mm
 d = dd-tol-corr : 33.715 mm
 z min : 0.9546

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.5751 N/mm²

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CALCULATION OF 1.5 D BENDS UNDER INTERNAL PRESSURE ACC. TO STW D0210

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS
 Diameter : 21.34 mm
 Radius : 19.05 mm
 Nominal wallthickness : 4.775 mm SCHED 160
 Tolerance : 0.597 mm See D0101 par.3.4

MATERIAL : ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 2.466 mm
 d = dd-tol-corr : 3.178 mm
 z min : 0.7589

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 14.5609 N/mm²

NOT CORRECT. [dd > 0.3*Di] -> See Stoomwezen D0201 par.1.
 =====

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS
 Diameter : 26.67 mm
 Radius : 28.58 mm
 Nominal wallthickness : 5.563 mm SCHED 160
 Tolerance : 0.695 mm See D0101 par.3.4

MATERIAL : ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 2.708 mm
 d = dd-tol-corr : 3.867 mm
 z min : 0.6774

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 16.3113 N/mm²

NOT CORRECT. [dd > 0.3*Di] -> See Stoomwezen D0201 par.1.

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CALCULATION OF 1.5 D BENDS UNDER INTERNAL PRESSURE ACC. TO STW D0210

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 33.40 mm
 Radius : 38.10 mm
 Nominal wallthickness : 6.350 mm SCHED 160
 Tolerance : 0.794 mm See D0101 par.3.4

MATERIAL

ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 3.280 mm
 d = dd-tol-corr : 4.556 mm
 z min : 0.6986

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 15.8181 N/mm²

NOT CORRECT. [dd > 0.3*Di] -> See Stoomwezen D0201 par.1.

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 48.26 mm
 Radius : 57.15 mm
 Nominal wallthickness : 7.137 mm SCHED 160
 Tolerance : 0.892 mm See D0101 par.3.4

MATERIAL

ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 4.654 mm
 d = dd-tol-corr : 5.245 mm
 z min : 0.8788

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 12.5742 N/mm²

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

Time: 11:25:56

Project: VARIOUS CALCULATIONS

Jobnr: PV2021



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CALCULATION OF 1.5 D BENDS UNDER INTERNAL PRESSURE ACC. TO STW D0210

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 60.33 mm
 Radius : 76.20 mm
 Nominal wallthickness : 8.738 mm SCHED 160
 Tolerance : 1.092 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 5.657 mm
 d = dd-tol-corr : 6.645 mm
 z min : 0.8399

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 13.1558 N/mm²

=====

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 88.90 mm
 Radius : 114.30 mm
 Nominal wallthickness : 11.125 mm SCHED 160
 Tolerance : 1.391 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 8.277 mm
 d = dd-tol-corr : 8.735 mm
 z min : 0.9437

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.7095 N/mm²

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CALCULATION OF 1.5 D BENDS UNDER INTERNAL PRESSURE ACC. TO STW D0210

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 114.30 mm
 Radius : 152.40 mm
 Nominal wallthickness : 13.487 mm SCHED 160
 Tolerance : 1.686 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 10.496 mm
 d = dd-tol-corr : 10.801 mm
 z min : 0.9695

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.3974 N/mm²

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 168.27 mm
 Radius : 228.60 mm
 Nominal wallthickness : 21.946 mm XXS
 Tolerance : 2.743 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 15.347 mm
 d = dd-tol-corr : 18.202 mm
 z min : 0.8312

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 13.2937 N/mm²

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CALCULATION OF 1.5 D BENDS UNDER INTERNAL PRESSURE ACC. TO STW D0210

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 219.07 mm
 Radius : 304.80 mm
 Nominal wallthickness : 24.000 mm No Sched.
 Tolerance : 3.000 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 19.814 mm
 d = dd-tol-corr : 20.000 mm
 z min : 0.9900

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.1614 N/mm²

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 273.05 mm
 Radius : 381.00 mm
 Nominal wallthickness : 30.000 mm No Sched.
 Tolerance : 3.750 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 24.672 mm
 d = dd-tol-corr : 25.250 mm
 z min : 0.9754

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.3291 N/mm²

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

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CALCULATION OF 1.5 D BENDS UNDER INTERNAL PRESSURE ACC. TO STW D0210

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 323.85 mm
 Radius : 457.20 mm
 Nominal wallthickness : 35.000 mm No Sched.
 Tolerance : 4.375 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 29.147 mm
 d = dd-tol-corr : 29.625 mm
 z min : 0.9826

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.2452 N/mm²

Design Pressure : 11.0500 Mpa
 Test pressure : 145.65 bar See T0240 par.3.1.2
 Test pressure according the Eurocode: 263.52 bar PED annex 1 par 7.4
 Temperature : 515.000 degr. C
 Corrosion : 1.00 mm

DIMENSIONS

Diameter : 355.60 mm
 Radius : 533.40 mm
 Nominal wallthickness : 38.000 mm No Sched.
 Tolerance : 4.750 mm See D0101 par.3.4

MATERIAL

: ASTM A 234 WP22+ A 520 2Cr-1Mo
 Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C : 207.00 N/mm²
 Rm Tensile strength : 414.00 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C: 108.50 N/mm²
 f Design Stress : 72.69 N/mm²
 z weld : 1.00

Min. d req'd for internal pressure : 31.397 mm
 d = dd-tol-corr : 32.250 mm
 z min : 0.9715

According D0201 par.4 -> z min < z weld <= 1
 Maximum allowable pressure : 11.3737 N/mm²

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

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Project: VARIOUS CALCULATIONS

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CALCULATION OF 1.5 D BENDS UNDER INTERNAL PRESSURE ACC. TO STW D0210

Design Pressure	:	11.0500	Mpa	
Test pressure	:	145.65	bar	See T0240 par.3.1.2
Test pressure according the Eurocode	:	263.52	bar	PED annex 1 par 7.4
Temperature	:	515.000	degr. C	
Corrosion	:	1.00	mm	

DIMENSIONS

Diameter	:	457.20	mm	
Radius	:	685.80	mm	
Nominal wallthickness	:	48.000	mm	No Sched.
Tolerance	:	6.000	mm	See D0101 par.3.4

MATERIAL

ASTM A 234 WP22+ A 520 2Cr-1Mo
Ansi B16.9 Seamless

Re Yieldstress at 20 degr. C	:	207.00	N/mm ²	
Rm Tensile strength	:	414.00	N/mm ²	
Re(Tm) Yieldstress at 515.00 degr. C	:	108.50	N/mm ²	
f Design Stress	:	72.69	N/mm ²	
z weld	:	1.00		

Min. d req'd for internal pressure	:	40.367	mm	
d = dd-tol-corr	:	41.000	mm	
z min	:	0.9834		

According D0201 par.4 -> z min < z weld <= 1
Maximum allowable pressure : 11.2366 N/mm²

BRANCHED CONNECTIONS COMPUTER RESULTS

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

Time: 11:25:56

Project: VARIOUS CALCULATIONS

Jobnr: PV2021



1 CALCULATION OF WELDED TEE UNDER INTERNAL PRESSURE ACC. TO RTOD D0501.

2
3 Design Pressure : 11.050 Mpa
4 Test pressure according the RTOD : 145.650 bar
5 Test pressure according Eurocode PED : 263.52 bar
6 Temperature : 515.000 degr. C
7 Corrosion : 1.000 mm
8

9 DIMENSIONS OF RUN PIPE

10 Outside Diameter : 88.900 mm
11 Nominal wallthickness : 11.125 mm SCHED_160
12 Tolerance : 1.391 mm
13 Netto thickness of the run pipe : 8.735 mm
14 z weld : 1.000
15 z min required : 0.698
16

17 DIMENSIONS OF BRANCH PIPE

18 Outside Diameter : 88.900 mm
19 Nominal wallthickness : 11.125 mm SCHED_160
20 Tolerance : 1.391 mm
21 Netto thickness of the branch pipe : 8.735 mm
22 z weld : 1.000
23

24 DIMENSIONS TEE

25 Diameter header : 88.900 mm
26 Nominal wallthickness : 11.125 mm SCHED_160
27 Tolerance : 1.391 mm
28 Netto thickness of the header pipe : 8.735 mm
29 z min required : 0.698
30

31 Diameter outlet : 88.900 mm
32 Nominal wallthickness : 11.125 mm SCHED_160
33 Tolerance : 1.391 mm
34 Netto thickness of the outlet pipe : 8.735 mm
35

36 Max. external radius of curvature ro : 32.000 mm
37 Crotch thickness : 16.688 mm
38 Dimension centerline to end : 85.852 mm
39 Dimension centerline to top : 85.852 mm
40

41 Half width of reinforcement zone : 26.977 mm
42 Local Inside diameter at boundary : 71.431 mm
43 Local Wall thickness at boundary : 9.044 mm
44

45 Altitude of reinforcement zone : 33.077 mm
46 Local Inside diameter at boundary : 71.431 mm
47 Local Wall thickness at boundary : 8.735 mm
48

49 MATERIAL : ASTM A 234 WP22+ A 520 2Cr-1Mo
50 Re Yieldstress at 20 degr. C : 207.000 N/mm²
51 Rm Tensile strength : 414.000 N/mm²
52 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
53 f2 Design Stress : 72.695 N/mm²
54

55 CALCULATED AREAS

56 A0 Cross sectional area in header : 802.413 mm²
57 A1*(f1/f) Additional Cross sectional area: 0.000 mm²
58 ----- +
59 A Load carrying cross-sectional area : 802.413 mm²
60
61 Ap Pressurized area : 4256.770 mm²
62

63 CONCLUSION

64 z3 Strength reduction coefficient : 0.791 mm
65 z3 to be >= z min
66 0.791 >= 0.698 Criterium is fullfilled Ratio = 0.882
67

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

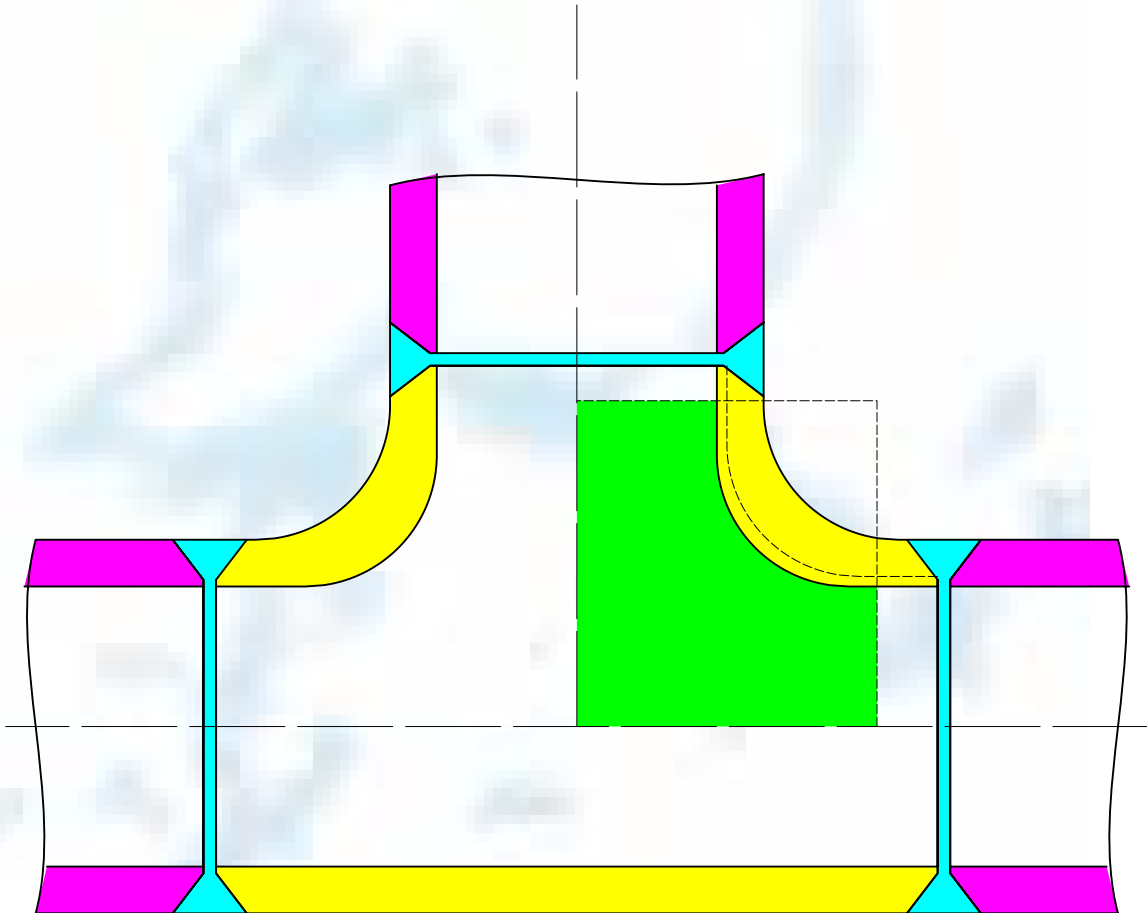
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Project: VARIOUS CALCULATIONS

Jobnr: PV2021

Welding Tee 88.900 mm x 88.900 mm 11.125 mm x 11.125 mm



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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

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Project: VARIOUS CALCULATIONS

Jobnr: PV2021



1 CALCULATION OF WELDED TEE UNDER INTERNAL PRESSURE ACC. TO RTOD D0501.

2
3 Design Pressure : 11.050 Mpa
4 Test pressure according the RTOD : 145.650 bar
5 Test pressure according Eurocode PED : 263.52 bar
6 Temperature : 515.000 degr. C
7 Corrosion : 1.000 mm
8

9 DIMENSIONS OF RUN PIPE

10 Outside Diameter : 114.300 mm
11 Nominal wallthickness : 11.125 mm SCHED_120
12 Tolerance : 1.391 mm
13 Netto thickness of the run pipe : 8.735 mm
14 z weld : 1.000
15 z min required : 0.919
16

17 DIMENSIONS OF BRANCH PIPE

18 Outside Diameter : 114.300 mm
19 Nominal wallthickness : 11.125 mm SCHED_120
20 Tolerance : 1.391 mm
21 Netto thickness of the branch pipe : 8.735 mm
22 z weld : 1.000
23

24 DIMENSIONS TEE

25 Diameter header : 114.300 mm
26 Nominal wallthickness : 17.500 mm No Schedule
27 Tolerance : 2.188 mm
28 Netto thickness of the header pipe : 14.313 mm
29 z min required : 0.531
30

31 Diameter outlet : 114.300 mm
32 Nominal wallthickness : 17.500 mm No Schedule
33 Tolerance : 2.188 mm
34 Netto thickness of the outlet pipe : 14.313 mm
35

36 Max. external radius of curvature ro : 32.000 mm
37 Crotch thickness : 26.250 mm
38 Dimension centerline to end : 104.648 mm
39 Dimension centerline to top : 104.648 mm
40

41 Half width of reinforcement zone : 35.061 mm
42 Local Inside diameter at boundary : 91.267 mm
43 Local Wall thickness at boundary : 11.914 mm
44

45 Altitude of reinforcement zone : 37.957 mm
46 Local Inside diameter at boundary : 96.831 mm
47 Local Wall thickness at boundary : 8.735 mm
48

49 MATERIAL : ASTM A 234 WP22+ A 520 2Cr-1Mo
50 Re Yieldstress at 20 degr. C : 207.000 N/mm²
51 Rm Tensile strength : 414.000 N/mm²
52 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
53 f2 Design Stress : 72.695 N/mm²
54

55 CALCULATED AREAS

56 A0 Cross sectional area in header : 1250.762 mm²
57 A1*(f1/f) Additional Cross sectional area: 1.016 mm²
58 ----- +
59 A Load carrying cross-sectional area : 1251.778 mm²
60
61 Ap Pressurized area : 7027.375 mm²
62

63 CONCLUSION

64 z3 Strength reduction coefficient : 0.571 mm
65 z3 to be >= z min
66 0.571 >= 0.531 Criterium is fullfilled Ratio = 0.929
67

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

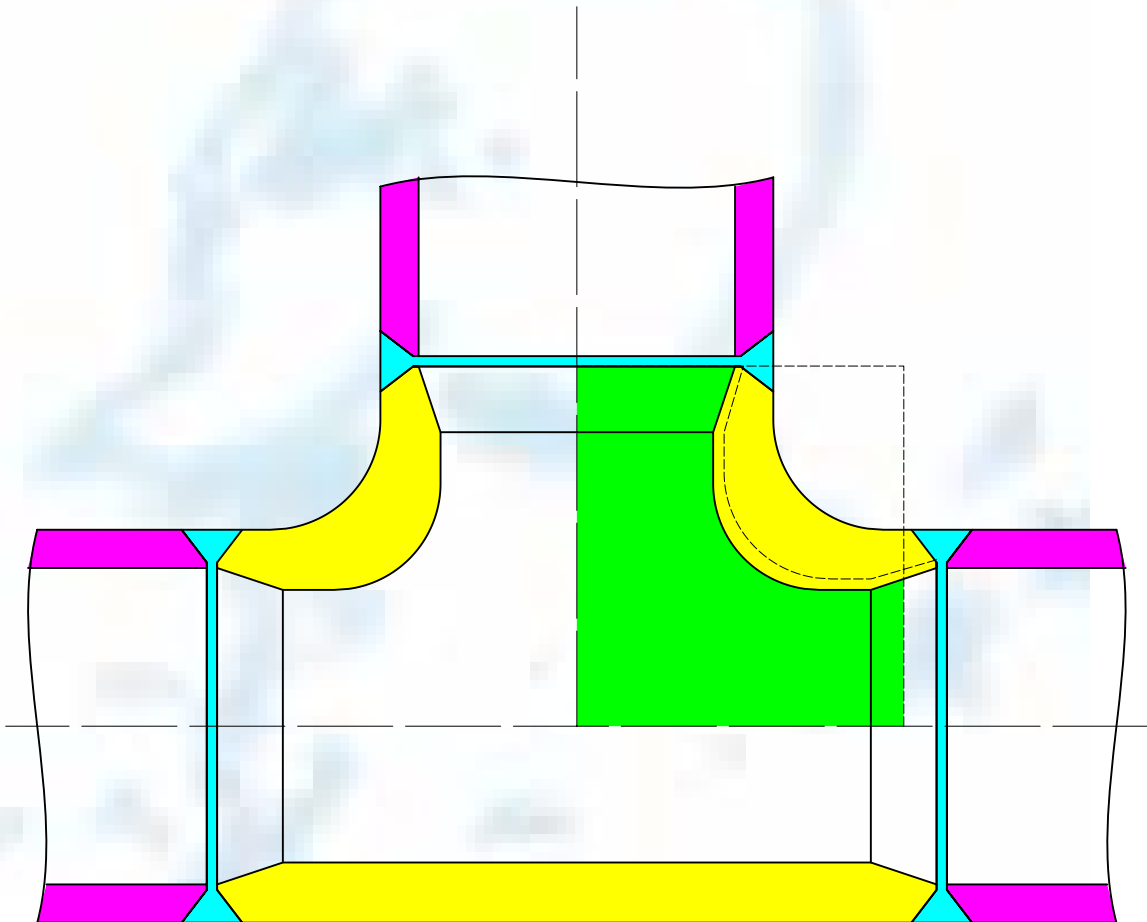
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Project: VARIOUS CALCULATIONS

Jobnr: PV2021

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Welding Tee 114.300 mm x 114.300 mm 17.500 mm x 17.500 mm



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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

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Project: VARIOUS CALCULATIONS

Jobnr: PV2021



1	CALCULATION OF WELDED TEE UNDER INTERNAL PRESSURE ACC. TO RTOD D0501.		
2			
3	Design Pressure	: 11.050	Mpa
4	Test pressure according the RTOD	: 145.650	bar
5	Test pressure according Eurocode PED	: 263.52	bar
6	Temperature	: 515.000	degr. C
7	Corrosion	: 1.000	mm
8			
9	DIMENSIONS OF RUN PIPE		
10	Outside Diameter	: 168.275	mm
11	Nominal wallthickness	: 18.263	mm SCHED_160
12	Tolerance	: 2.283	mm
13	Netto thickness of the run pipe	: 14.980	mm
14	z weld	: 1.000	
15	z min required	: 0.778	
16			
17	DIMENSIONS OF BRANCH PIPE		
18	Outside Diameter	: 114.300	mm
19	Nominal wallthickness	: 11.125	mm SCHED_120
20	Tolerance	: 1.391	mm
21	Netto thickness of the branch pipe	: 8.735	mm
22	z weld	: 1.000	
23			
24	DIMENSIONS TEE		
25	Diameter header	: 168.275	mm
26	Nominal wallthickness	: 22.000	mm No Schedule
27	Tolerance	: 2.750	mm
28	Netto thickness of the header pipe	: 18.250	mm
29	z min required	: 0.625	
30			
31	Diameter outlet	: 114.300	mm
32	Nominal wallthickness	: 22.000	mm No Schedule
33	Tolerance	: 2.750	mm
34	Netto thickness of the outlet pipe	: 18.250	mm
35			
36	Max. external radius of curvature ro	: 30.257	mm
37	Crotch thickness	: 33.000	mm
38	Dimension centerline to end	: 142.748	mm
39	Dimension centerline to top	: 130.048	mm
40			
41	Half width of reinforcement zone	: 52.325	mm
42	Local Inside diameter at boundary	: 131.775	mm
43	Local Wall thickness at boundary	: 18.250	mm
44			
45	Altitude of reinforcement zone	: 41.082	mm
46	Local Inside diameter at boundary	: 94.002	mm
47	Local Wall thickness at boundary	: 10.351	mm
48			
49	MATERIAL	: ASTM A 234 WP22+ A 520	2Cr-1Mo
50	Re Yieldstress at 20 degr. C	: 207.000	N/mm ²
51	Rm Tensile strength	: 414.000	N/mm ²
52	Re(Tm) Yieldstress at 515.00 degr. C	: 108.500	N/mm ²
53	f2 Design Stress	: 72.695	N/mm ²
54			
55	CALCULATED AREAS		
56	A0 Cross sectional area in header	: 1757.316	mm ²
57	A1*(f1/f) Additional Cross sectional area:	: 0.000	mm ²
58			----- +
59	A Load carrying cross-sectional area	: 1757.316	mm ²
60			
61	Ap Pressurized area	: 9048.092	mm ²
62			
63	CONCLUSION		
64	z3 Strength reduction coefficient	: 0.728	mm
65	z3 to be >= z min		
66	0.728 >= 0.625 Criterium is fullfilled		Ratio = 0.859
67			

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EXAMPLE OF PIPESPEC CALCULATION

FOR USE ON WEB-SITE

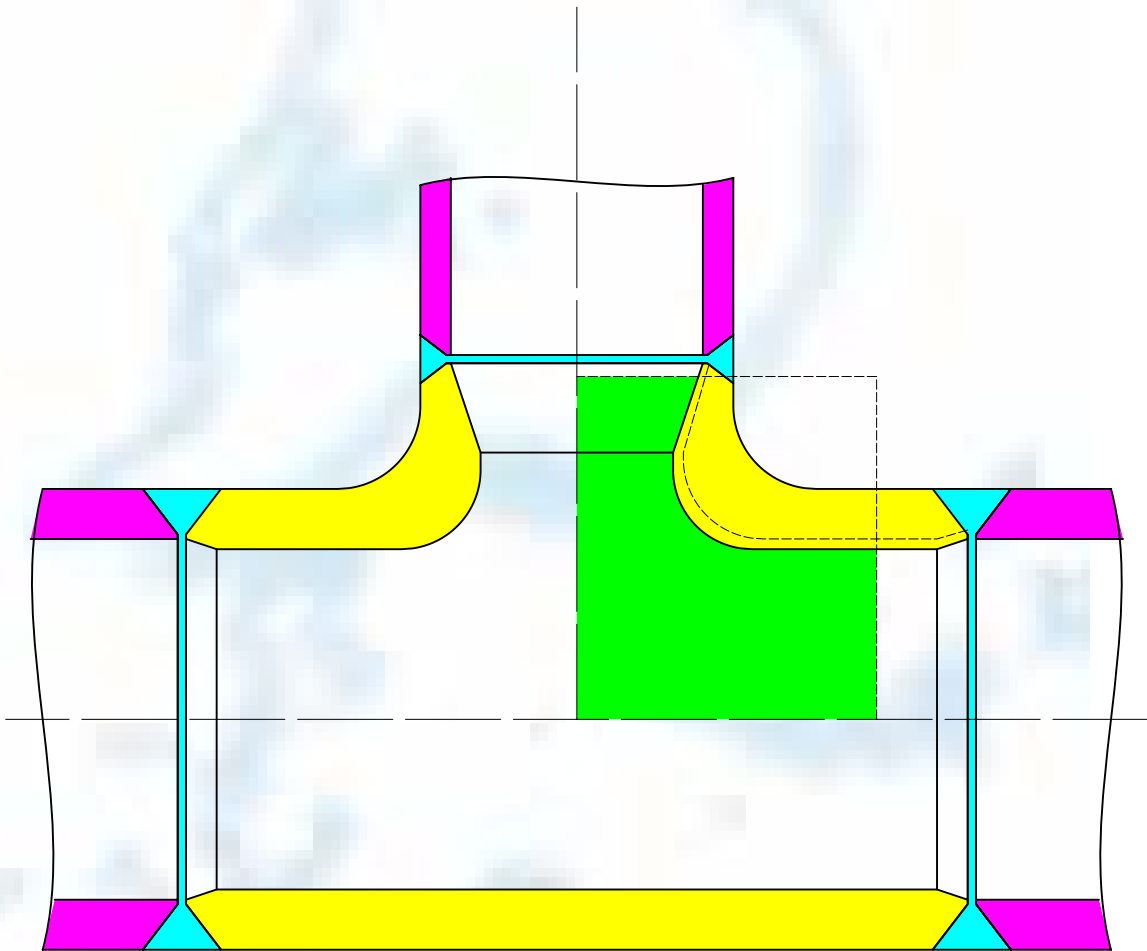
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Jobnr: PV2021

Welding Tee 168.275 mm x 114.300 mm 22.000 mm x 22.000 mm



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Jobnr: PV2021



1	CALCULATION OF WELDED TEE UNDER INTERNAL PRESSURE ACC. TO RTOD D0501.		
2			
3	Design Pressure	: 11.050	Mpa
4	Test pressure according the RTOD	: 145.650	bar
5	Test pressure according Eurocode PED	: 263.52	bar
6	Temperature	: 515.000	degr. C
7	Corrosion	: 1.000	mm
8			
9	DIMENSIONS OF RUN PIPE		
10	Outside Diameter	: 168.275	mm
11	Nominal wallthickness	: 18.263	mm SCHED_160
12	Tolerance	: 2.283	mm
13	Netto thickness of the run pipe	: 14.980	mm
14	z weld	: 1.000	
15	z min required	: 0.778	
16			
17	DIMENSIONS OF BRANCH PIPE		
18	Outside Diameter	: 168.275	mm
19	Nominal wallthickness	: 18.263	mm SCHED_160
20	Tolerance	: 2.283	mm
21	Netto thickness of the branch pipe	: 14.980	mm
22	z weld	: 1.000	
23			
24	DIMENSIONS TEE		
25	Diameter header	: 168.275	mm
26	Nominal wallthickness	: 29.000	mm No Schedule
27	Tolerance	: 3.625	mm
28	Netto thickness of the header pipe	: 24.375	mm
29	z min required	: 0.449	
30			
31	Diameter outlet	: 168.275	mm
32	Nominal wallthickness	: 29.000	mm No Schedule
33	Tolerance	: 3.625	mm
34	Netto thickness of the outlet pipe	: 24.375	mm
35			
36	Max. external radius of curvature ro	: 32.000	mm
37	Crotch thickness	: 43.500	mm
38	Dimension centerline to end	: 142.748	mm
39	Dimension centerline to top	: 142.748	mm
40			
41	Half width of reinforcement zone	: 47.920	mm
42	Local Inside diameter at boundary	: 138.315	mm
43	Local Wall thickness at boundary	: 14.980	mm
44			
45	Altitude of reinforcement zone	: 59.900	mm
46	Local Inside diameter at boundary	: 138.315	mm
47	Local Wall thickness at boundary	: 14.980	mm
48			
49	MATERIAL	: ASTM A 234 WP22+ A 520	2Cr-1Mo
50	Re Yieldstress at 20 degr. C	: 207.000	N/mm ²
51	Rm Tensile strength	: 414.000	N/mm ²
52	Re(Tm) Yieldstress at 515.00 degr. C	: 108.500	N/mm ²
53	f2 Design Stress	: 72.695	N/mm ²
54			
55	CALCULATED AREAS		
56	A0 Cross sectional area in header	: 2232.923	mm ²
57	A1*(f1/f) Additional Cross sectional area:	252.704	mm ²
58		-----	+
59	A Load carrying cross-sectional area	: 2485.626	mm ²
60			
61	Ap Pressurized area	: 14856.979	mm ²
62			
63	CONCLUSION		
64	z3 Strength reduction coefficient	: 0.456	mm
65	z3 to be >= z min		
66	0.456 >= 0.449 Criterium is fullfilled		Ratio = 0.985
67			

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EXAMPLE OF PIPESPEC CALCULATION

FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

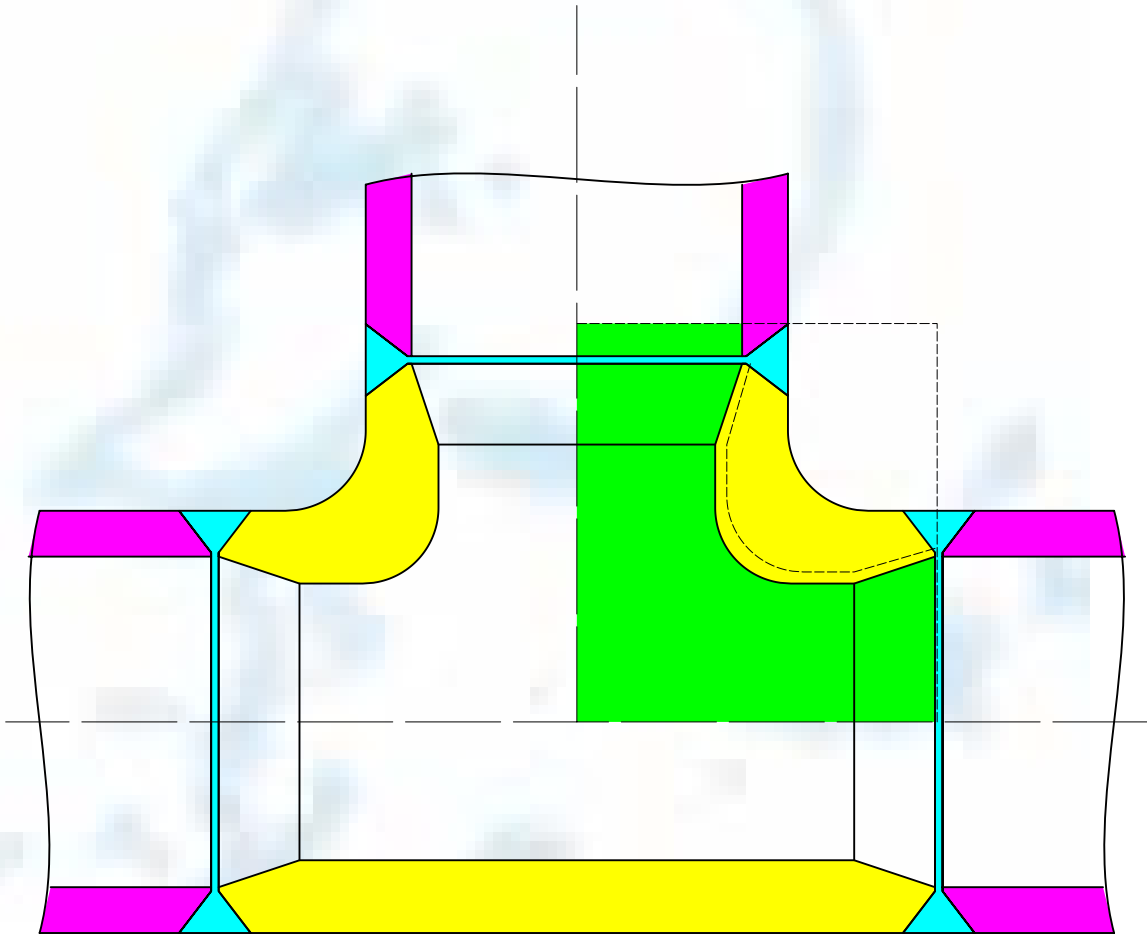
Time: 11:25:56

Project: VARIOUS CALCULATIONS

Jobnr: PV2021

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Welding Tee 168.275 mm x 168.275 mm 29.000 mm x 29.000 mm



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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

Time: 11:25:56

Project: VARIOUS CALCULATIONS

Jobnr: PV2021



CALCULATION OF PIPE TO PIPE CONN. UNDER INTERNAL PRESSURE ACC. TO RToD D0501.

Design Pressure : 11.050 Mpa
 Test pressure according the RToD : 145.650 bar
 Test pressure according Eurocode PED : 263.52 bar
 Temperature : 515.000 degr. C
 Corrosion : 1.000 mm

DIMENSIONS OF RUN PIPE

Outside Diameter : 219.075 mm
 Inside Diameter : 184.982 mm
 Nominal wallthickness : 20.625 mm
 Tolerance : 2.578 mm
 Netto thickness of the run pipe : 17.047 mm
 Min. req. thickness of the run pipe : 15.474 mm
 z weld : 1.000
 z min required : 0.901

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f Design Stress : 72.695 N/mm²

DIMENSIONS OF BRANCH PIPE

Outside Diameter : 219.075 mm
 Inside Diameter : 184.982 mm
 Nominal wallthickness : 20.625 mm
 Tolerance : 2.578 mm
 Netto thickness of the branch pipe : 17.047 mm
 z weld : 1.000

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f1 Design Stress : 72.695 N/mm²

DIMENSIONS OF SET-ON NOZZLE

Half width of reinforcement zone : 59.140 mm
 Altitude of reinforcement zone : 73.356 mm

DIMENSIONS OF ADDITIONAL REINFORCEMENT RING

Outside Diameter : 336.000 mm
 Nominal thickness : 41.250 mm
 Tolerance : 5.156 mm
 Effective thickness : 25.570 mm
 k reinforcement efficiency factor : 0.750

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f2 Design Stress : 72.695 N/mm²

CALCULATED AREAS

A0 Cross sectional area in header : 1290.974 mm²
 A1 Cross sectional area in branch : 1250.480 mm²
 A2 Cross sectional area in reinforcing : 1500.575 mm² x 0.75
 -----+
 A Load carrying cross-sectional area : 3666.885 mm²
 Ap Pressurized area : 23920.451 mm²

CONCLUSION

z3 Strength reduction coefficient : 0.844 mm
 z3 to be >= z min
 0.844 >= 0.901 **Criterion is NOT fullfilled.** Ratio = 1.068

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

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Jobnr: PV2021



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CALCULATION OF PIPE TO PIPE CONN. UNDER INTERNAL PRESSURE ACC. TO RToD D0501.

Design Pressure : 11.050 Mpa
 Test pressure according the RToD : 145.650 bar
 Test pressure according Eurocode PED : 263.52 bar
 Temperature : 515.000 degr. C
 Corrosion : 1.000 mm

DIMENSIONS OF RUN PIPE

Outside Diameter : 273.050 mm
 Inside Diameter : 230.600 mm
 Nominal wallthickness : 25.400 mm
 Tolerance : 3.175 mm
 Netto thickness of the run pipe : 21.225 mm
 Min. req. thickness of the run pipe : 19.287 mm
 z weld : 1.000
 z min required : 0.902

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f Design Stress : 72.695 N/mm²

DIMENSIONS OF BRANCH PIPE

Outside Diameter : 273.050 mm
 Inside Diameter : 230.600 mm
 Nominal wallthickness : 25.400 mm
 Tolerance : 3.175 mm
 Netto thickness of the branch pipe : 21.225 mm
 z weld : 1.000

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f1 Design Stress : 72.695 N/mm²

DIMENSIONS OF SET-ON NOZZLE

Half width of reinforcement zone : 73.670 mm
 Altitude of reinforcement zone : 91.387 mm

DIMENSIONS OF ADDITIONAL REINFORCEMENT RING

Outside Diameter : 419.000 mm
 Nominal thickness : 50.800 mm
 Tolerance : 6.350 mm
 Effective thickness : 31.838 mm
 k reinforcement efficiency factor : 0.750

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f2 Design Stress : 72.695 N/mm²

CALCULATED AREAS

A0 Cross sectional area in header : 2002.248 mm²
 A1 Cross sectional area in branch : 1939.684 mm²
 A2 Cross sectional area in reinforcing : 2327.621 mm² x 0.75
 -----+
 A Load carrying cross-sectional area : 5687.647 mm²
 Ap Pressurized area : 37154.983 mm²

CONCLUSION

z3 Strength reduction coefficient : 0.844 mm
 z3 to be >= z min
 0.844 >= 0.902 **Criterion is NOT fulfilled.** Ratio = 1.069

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EXAMPLE OF PIPESPEC CALCULATION FOR USE ON WEB-SITE

Date: Wo 03-Feb-2021

Time: 11:25:56

Project: VARIOUS CALCULATIONS

Jobnr: PV2021



CALCULATION OF PIPE TO PIPE CONN. UNDER INTERNAL PRESSURE ACC. TO RToD D0501.

Design Pressure : 11.050 Mpa
 Test pressure according the RToD : 145.650 bar
 Test pressure according Eurocode PED : 263.52 bar
 Temperature : 515.000 degr. C
 Corrosion : 1.000 mm

DIMENSIONS OF RUN PIPE

Outside Diameter : 323.850 mm
 Inside Diameter : 275.844 mm
 Nominal wallthickness : 28.575 mm
 Tolerance : 3.572 mm
 Netto thickness of the run pipe : 24.003 mm
 Min. req. thickness of the run pipe : 22.875 mm
 z weld : 1.000
 z min required : 0.949

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f Design Stress : 72.695 N/mm²

DIMENSIONS OF BRANCH PIPE

Outside Diameter : 323.850 mm
 Inside Diameter : 275.844 mm
 Nominal wallthickness : 28.575 mm
 Tolerance : 3.572 mm
 Netto thickness of the branch pipe : 24.003 mm
 z weld : 1.000

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f1 Design Stress : 72.695 N/mm²

DIMENSIONS OF SET-ON NOZZLE

Half width of reinforcement zone : 85.155 mm
 Altitude of reinforcement zone : 106.046 mm

DIMENSIONS OF ADDITIONAL REINFORCEMENT RING

Outside Diameter : 493.000 mm
 Nominal thickness : 57.150 mm
 Tolerance : 7.144 mm
 Effective thickness : 36.005 mm
 k reinforcement efficiency factor : 0.750

MATERIAL : ASTM A 335 Gr.P22+ A 520 2Cr-1Mo

Re Yieldstress at 20 degr. C : 207.000 N/mm²
 Rm Tensile strength : 414.000 N/mm²
 Re(Tm) Yieldstress at 515.00 degr. C : 108.500 N/mm²
 f2 Design Stress : 72.695 N/mm²

CALCULATED AREAS

A0 Cross sectional area in header : 2612.495 mm²
 A1 Cross sectional area in branch : 2545.432 mm²
 A2 Cross sectional area in reinforcing : 3054.518 mm² x 0.75
 -----+
 A Load carrying cross-sectional area : 7448.816 mm²
 Ap Pressurized area : 51970.432 mm²

CONCLUSION

z3 Strength reduction coefficient : 0.835 mm
 z3 to be >= z min
 0.835 >= 0.949 **Criterion is NOT fullfilled.** Ratio = 1.137

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