Implementation and Analysis of the continuous gate-sizing algorithm

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EE6332 : Jan-May 2023

Min. Area solution

ctest

Twall (in 5 ps) = 50.25002

Area = 4063.71792

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	52.76252	52.76252	2682.43909
1.1	55.27503	55.27502	2459.19381
1.2	60.30003	60.30005	2127.65275
1.3	65.32503	65.32501	1874.02314
1.4	70.35003	70.35002	1672.36654
1.5	75.37503	75.37503	1508.27209

c17

Twall (in 5 ps) = 41.97113

Area = 149.50002

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	44.06968	44.06968	113.09453
1.1	46.16824	46.16823	98.45202
1.2	50.36536	50.36538	84.51006
1.3	54.56247	54.56245	74.85014
1.4	58.75958	58.75957	67.05860
1.5	62.95669	62.95669	60.65431

c432

Twall (in 5 ps) = 161.48447

Area = 2055.24818

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	169.55870	169.55867	840.05303
1.1	177.63292	177.63289	650.98608
1.2	193.78137	193.78145	493.14425
1.3	209.92982	209.92976	414.65509
1.4	226.07826	226.07821	367.45555
1.5	242.22671	242.22668	336.48413

c880

Twall (in 5 ps) = 133.67026

Area = 3510.47011

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	140.35377	140.35375	1048.52051
1.1	147.03728	147.03726	947.12644
1.2	160.40431	160.40438	859.17737
1.3	173.77133	173.77129	804.16807
1.4	187.13836	187.13832	765.45741
1.5	200.50539	200.50536	736.40460

c1908

Twall (in 5 ps) = 193.37146

Area = 10373.89589

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	203.04003	203.03999	1946.22203
1.1	212.70861	212.70857	1707.24593
1.2	232.04575	232.04585	1523.53706
1.3	251.38290	251.38283	1426.41293
1.4	270.72004	270.71998	1365.53976
1.5	290.05719	290.05716	1324.36868

c2670

Twall (in 5 ps) = 194.99950

Area = 17190.88539

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	204.74948	204.74944	3132.26705
1.1	214.49946	214.49941	2886.47985
1.2	233.99940	233.99951	2697.33785
1.3	253.49935	253.49928	2589.16459
1.4	272.99930	272.99924	2509.36276
1.5	292.49925	292.49922	2446.63154

c3540

Twall (in 5 ps) = 235.54501

Area = 15667.20987

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	247.32226	247.32221	3059.32535
1.1	259.09951	259.09946	2849.98136
1.2	282.65401	282.65413	2744.93591
1.3	306.20851	306.20843	2696.86007
1.4	329.76301	329.76293	2666.90177
1.5	353.31751	353.31747	2646.30393

c5315

Twall (in 5 ps) = 218.91751

Area = 22534.44868

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	229.86338	229.86334	4729.06649
1.1	240.80926	240.80921	4477.16229
1.2	262.70101	262.70113	4274.14443
1.3	284.59276	284.59268	4150.23535
1.4	306.48451	306.48444	4062.81293
1.5	328.37626	328.37623	3996.39272

c6288

Twall (in 5 ps) = 580.02082

Area = 21980.77597

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	609.02186	609.02176	3455.93487
1.1	638.02290	638.02279	3139.03531
1.2	696.02498	696.02529	2897.00476
1.3	754.02707	754.02687	2801.51249
1.4	812.02915	812.02896	2755.34247
1.5	870.03123	870.03114	2730.43587

c7552

Twall (in 5 ps) = 183.44337

Area = 32798.23355

Twall/Tspec	Tspec (in 5 ps)	Tout (in 5 ps)	Area
1.05	192.61553	192.61550	6717.62309
1.1	201.78770	201.78766	6276.43734
1.2	220.13204	220.13213	5973.48228
1.3	238.47637	238.47631	5808.68693
1.4	256.82071	256.82065	5695.04180
1.5	275.16505	275.16502	5611.22885

Circuit	Twall solution		Min area solution(T_{spec}/T_{wall})					
	Twall	Area	1.05	1.1	1.2	1.3	1.4	1.5
ctest*	50.25	4063.72	2682.44	2459.20	2127.65	1874.02	1672.37	1508.27
c17	41.97	149.50	113.09	98.45	84.51	74.85	67.06	60.65
c432	161.48	2055.24	840.05	650.99	493.14	414.66	367.46	336.48
c880	133.67	3510.47	1048.52	947.13	859.18	804.17	765.46	736.40
c1908*	193.37	10373.89	1946.22	1707.24	1523.54	1426.41	1365.54	1324.37
c2670*	194.99	17190.88	3132.27	2886.48	2697.34	2589.16	2509.36	2446.63
c3540	235.54	15667.20	3059.32	2849.98	2744.94	2696.86	2666.90	2646.30
c5315*	218.92	2534.49	4729.06	4477.16	4274.14	4150.23	4062.81	3996.39
c6288	580.02	1980.78	3455.93	3139.04	2897.00	2801.51	2755.34	2730.44
c7552*	183.44	2798.23	6717.62	6276.44	5973.48	5808.69	5695.04	5611.22

Cumulative finding
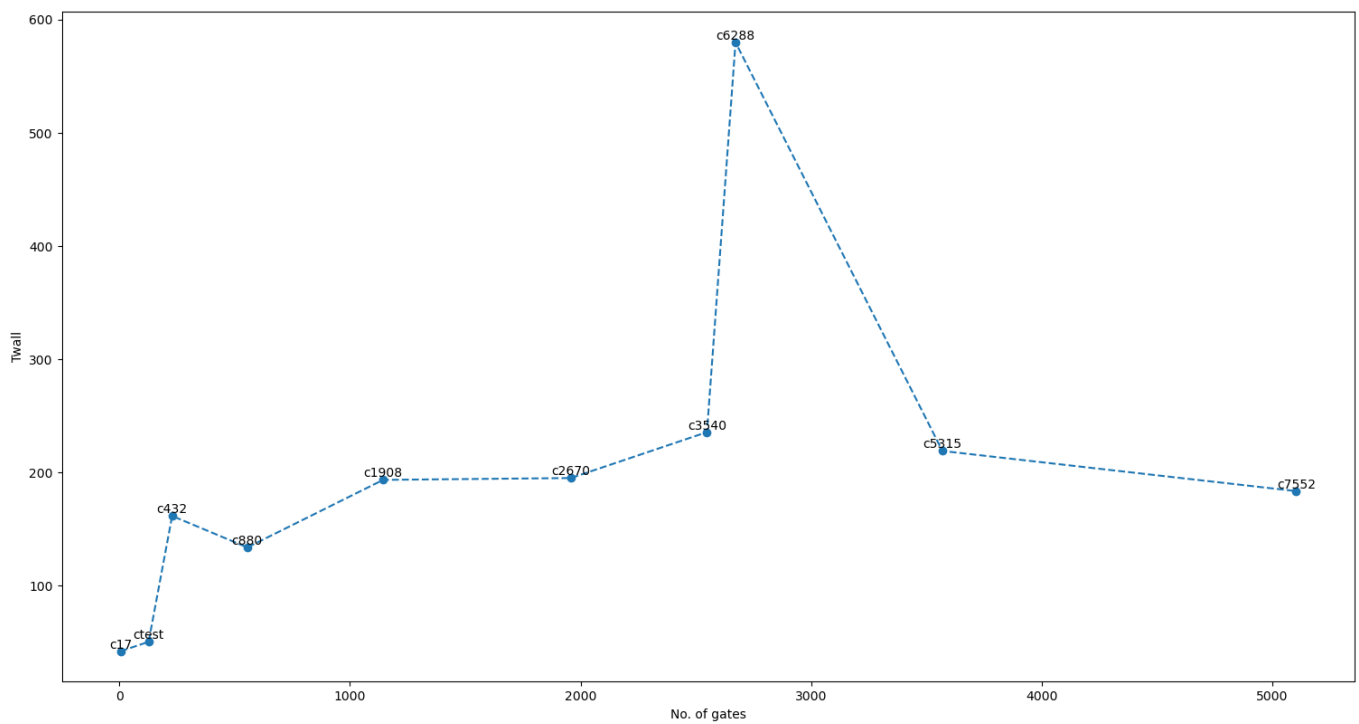
Plots

c2670 - min. Area vs. Tspec

c2670 with Twall (in 5 ps) = 194.99950

(1.05, 1946.22203)
(1.1, 1707.24593)
(1.2, 1523.53706)
(1.3, 1426.41293)
(1.4, 1365.53976)
(1.5, 1324.36868)

min. Area

Twall/Tspec

c6288 - min. Area vs. Tspec

c6288 with Twall (in 5 ps) = 580.02082

(1.05, 3455.93487)
(1.1, 3139.03531)
(1.2, 2897.00476)
(1.3, 2801.51249)
(1.4, 2755.34247)
(1.5, 2730.43587)
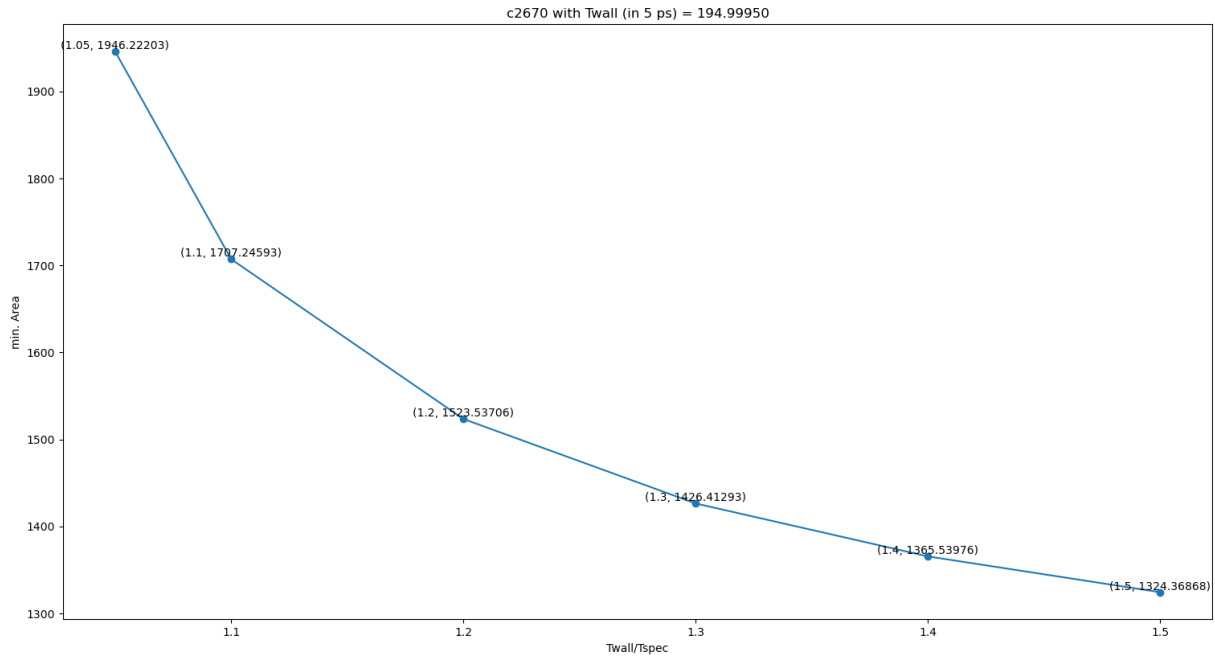
min. Area

Twall/Tspec
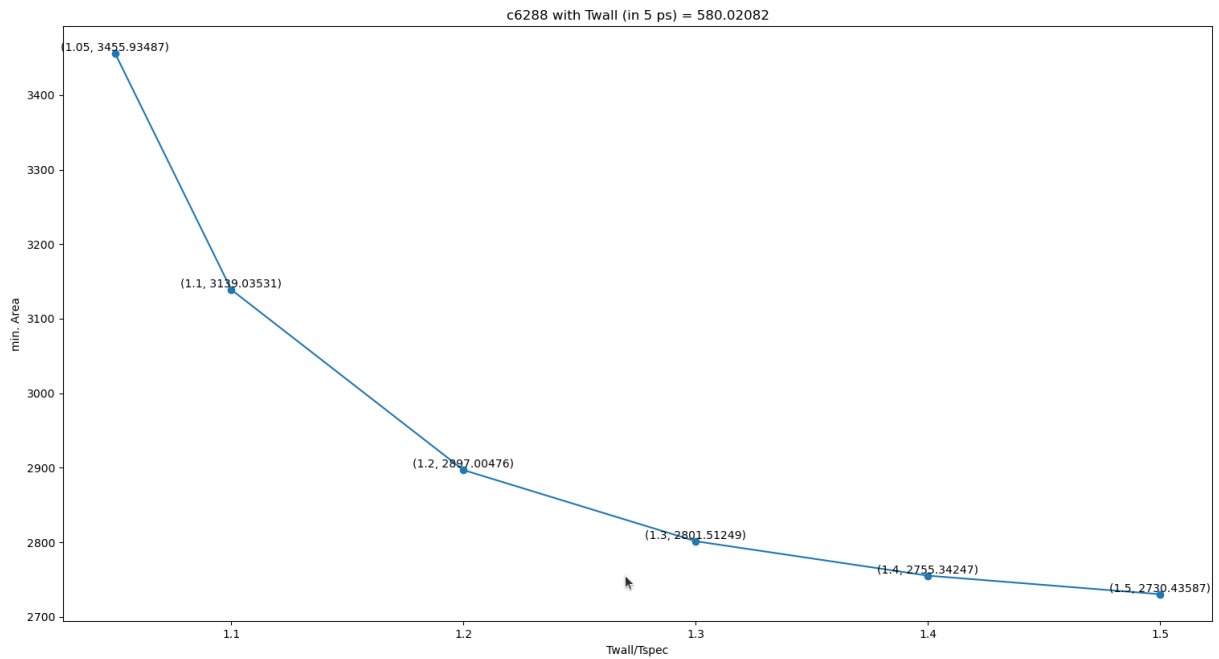
Twall vs. No. of gates

Circuit	No. of Gates	Twall (in 5 ps)
c17	6	41.97113
ctest	127	50.25002
c432	229	161.48447
c880	555	133.67026
c1908	1144	193.37146
c2670	1958	194.9995
c3540	2548	235.54501
c6288	2672	580.02082
c5315	3569	218.91751
c7552	5103	183.44337

Thank you!