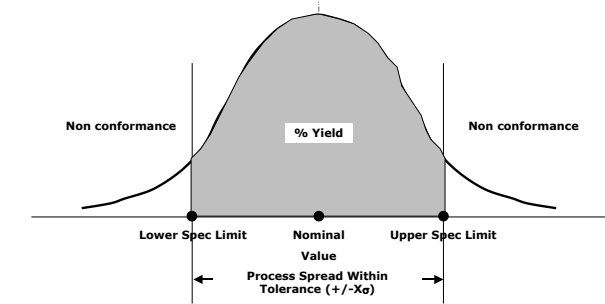


Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)

Process control & yield (without any shift in the mean)

σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	-	0.007978758	0.015956708	0.023933053	0.031906998	0.039877747	0.047844505	0.055806480	0.063762879	0.071712913
0.1	0.079655791	0.087590728	0.095516941	0.103433646	0.111340065	0.119235423	0.127118947	0.134989867	0.142847419	0.150690840
0.2	0.158519374	0.166332268	0.174128773	0.181908146	0.189669649	0.197412548	0.205136115	0.212839628	0.220522372	0.228183635
0.3	0.235822715	0.243438913	0.251031539	0.258599909	0.266143346	0.273661180	0.281152749	0.288617398	0.296054479	0.303463355
0.4	0.310843393	0.318193971	0.325514474	0.332804296	0.340062840	0.347289518	0.354483748	0.361644962	0.368772597	0.375866103
0.5	0.382924935	0.389948561	0.396936458	0.403888113	0.410803021	0.417680690	0.424520635	0.431322384	0.438085472	0.444809449
0.6	0.451493870	0.458138305	0.464742332	0.471305540	0.477827530	0.484307913	0.490746309	0.497142351	0.503495683	0.509805959
0.7	0.516072843	0.522296012	0.528475153	0.534609963	0.540700153	0.546745441	0.552745558	0.558700248	0.564609262	0.570472365
0.8	0.576289332	0.582059949	0.587784012	0.593461330	0.599091722	0.604675016	0.610211053	0.615699685	0.621140772	0.626534189
0.9	0.631879817	0.637177550	0.642427293	0.647628960	0.652782475	0.657887776	0.662944805	0.667953520	0.672913885	0.677825877
1	0.682689480	0.687504691	0.692271512	0.696989960	0.701660058	0.706281838	0.710855345	0.715380629	0.719857751	0.724286781
1.1	0.728667797	0.733000887	0.737286146	0.741523678	0.745713597	0.749856022	0.753951084	0.757998917	0.761999668	0.765953488
1.2	0.769860537	0.773720982	0.777534998	0.781302766	0.785024476	0.788700322	0.792330506	0.795915238	0.799454733	0.802949211
1.3	0.806398901	0.809804036	0.813164855	0.816481604	0.819754532	0.822983897	0.826169958	0.829312984	0.832413244	0.835471015
1.4	0.838486577	0.841460217	0.844392223	0.847282890	0.850132514	0.852941399	0.855709849	0.858438175	0.861126687	0.863775703
1.5	0.866385542	0.868956526	0.871488981	0.873983233	0.876439615	0.878858458	0.881240099	0.883584875	0.885893126	0.888165193
1.6	0.890401421	0.892602154	0.894767740	0.896898525	0.898994861	0.901057098	0.903085587	0.905080682	0.907042735	0.908972102
1.7	0.910869136	0.912734194	0.914567631	0.916369802	0.918141064	0.919881773	0.921592284	0.923272955	0.924924139	0.926546192
1.8	0.928139469	0.929704324	0.931241109	0.932750178	0.934231883	0.935686574	0.937114600	0.938516310	0.939892052	0.941242172
1.9	0.942567014	0.943866922	0.945142237	0.946393300	0.947620449	0.948824020	0.950004350	0.951161770	0.952296612	0.953409205
2	0.954499876	0.955568950	0.956616751	0.957643598	0.958649811	0.959635704	0.960601593	0.961547788	0.962474598	0.963382329
2.1	0.964271285	0.965141768	0.965994076	0.966828506	0.967645349	0.968444899	0.969227441	0.969993261	0.970742642	0.971475864
2.2	0.972193202	0.972894931	0.973581322	0.974252643	0.974909160	0.975551133	0.976178824	0.976792487	0.977392378	0.977978745
2.3	0.978551838	0.979111900	0.979659172	0.980193894	0.980716301	0.981226625	0.981725097	0.982211942	0.982687385	0.983151646
2.4	0.983604942	0.984047489	0.984479498	0.984901178	0.985312735	0.985714371	0.986106286	0.986488678	0.986861741	0.987225666
2.5	0.987580640	0.987926851	0.988264479	0.988593706	0.988914708	0.989227659	0.989532731	0.989830092	0.990119908	0.990402343
2.6	0.990677556	0.990945707	0.991206949	0.991461435	0.991709316	0.991950739	0.992185848	0.992414785	0.992637691	0.992854702
2.7	0.993065954	0.993271578	0.993471705	0.993666461	0.993855973	0.994040363	0.994219751	0.994394256	0.994563993	0.994729077
2.8	0.994889619	0.995045728	0.995197511	0.995345074	0.995488520	0.995627949	0.995763460	0.995895151	0.996023117	0.996147449
2.9	0.996268240	0.996385578	0.996499551	0.996610244	0.996717741	0.996822124	0.996923472	0.997021865	0.997117378	0.997210087
3	0.997300066	0.997387385	0.997472115	0.997554324	0.997634080	0.997711448	0.997786492	0.997859275	0.997929857	0.997998298



This table gives the yield of the process for a given level of process control. The level of control is given in terms of multiples of sigma.

E.g.: An engineer wants to estimate the yield of a process whose level of process control is 3.56σ (i.e. $\pm 3.56\sigma$ of the total variation/spread is within the tolerance) This is at times called the process sigma.

The engineer can refer the row corresponding to $\sigma=3.5$ and read the value corresponding to column=0.06 to get the yield of the process. For the process under consideration, the yield is 0.999629065 (99.96% approximately)

Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)



Process control & yield (without any shift in the mean) [continued]

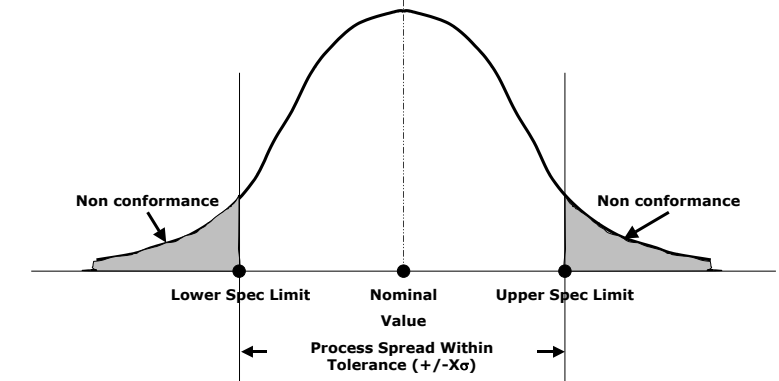
σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
3.1	0.998064658	0.998128991	0.998191355	0.998251803	0.998310388	0.998367163	0.998422177	0.998475480	0.998527119	0.998577143
3.2	0.998625596	0.998672523	0.998717968	0.998761973	0.998804579	0.998845827	0.998885756	0.998924405	0.998961810	0.998998008
3.3	0.999033035	0.999066925	0.999099711	0.999131427	0.999162105	0.999191774	0.999220467	0.999248211	0.999275036	0.999300969
3.4	0.999326038	0.999350270	0.999373688	0.999396320	0.999418188	0.999439318	0.999459730	0.999479449	0.999498495	0.999516889
3.5	0.999534653	0.999551806	0.999568368	0.999584356	0.999599790	0.999614688	0.999629065	0.999642940	0.999656329	0.999669246
3.6	0.999681709	0.999693730	0.999705326	0.999716509	0.999727293	0.999737692	0.999747719	0.999757385	0.999766703	0.999775684
3.7	0.999784340	0.999792681	0.999800719	0.999808463	0.999815924	0.999823111	0.999830033	0.999836700	0.999843121	0.999849303
3.8	0.999855255	0.999860986	0.999866502	0.999871811	0.999876921	0.999881839	0.999886571	0.999891123	0.999895503	0.999899716
3.9	0.999903769	0.999907666	0.999911415	0.999915019	0.999918484	0.999921815	0.999925017	0.999928095	0.999931054	0.999933896
4	0.999936628	0.999939252	0.999941774	0.999944196	0.999946522	0.999948757	0.999950902	0.999952962	0.999954941	0.999956840
4.1	0.999958663	0.999960412	0.999962092	0.999963703	0.999965249	0.999966733	0.999968156	0.999969522	0.999970831	0.999972087
4.2	0.999973292	0.999974447	0.999975554	0.999976616	0.999977633	0.999978609	0.999979543	0.999980439	0.999981298	0.999982120
4.3	0.999982908	0.999983663	0.999984386	0.999985078	0.999985741	0.999986376	0.999986984	0.999987566	0.999988123	0.999988656
4.4	0.999989166	0.999989654	0.999990122	0.999990569	0.999990996	0.999991406	0.999991797	0.999992171	0.999992529	0.999992871
4.5	0.999993198	0.999993511	0.999993810	0.999994096	0.999994369	0.999994630	0.999994880	0.999995118	0.999995346	0.999995563
4.6	0.999995771	0.999995969	0.999996159	0.999996339	0.999996512	0.999996677	0.999996834	0.999996985	0.999997128	0.999997265
4.7	0.999997395	0.999997520	0.999997639	0.999997752	0.999997860	0.999997963	0.999998062	0.999998155	0.999998245	0.999998330
4.8	0.999998411	0.999998489	0.999998563	0.999998633	0.999998700	0.999998764	0.999998825	0.999998882	0.999998938	0.999998990
4.9	0.999999040	0.999999088	0.999999133	0.999999176	0.999999218	0.999999257	0.999999294	0.999999329	0.999999363	0.999999395
5	0.999999426	0.999999455	0.999999482	0.999999509	0.999999534	0.999999557	0.999999580	0.999999602	0.999999622	0.999999641
5.1	0.999999660	0.999999677	0.999999694	0.999999710	0.999999725	0.999999739	0.999999753	0.999999765	0.999999778	0.999999789
5.2	0.999999800	0.999999811	0.999999821	0.999999830	0.999999839	0.999999848	0.999999856	0.999999863	0.999999871	0.999999877
5.3	0.999999884	0.999999890	0.999999896	0.999999902	0.999999907	0.999999912	0.999999917	0.999999921	0.999999925	0.999999929
5.4	0.999999933	0.999999937	0.999999940	0.999999944	0.999999947	0.999999950	0.999999952	0.999999955	0.999999957	0.999999960
5.5	0.999999962	0.999999964	0.999999966	0.999999968	0.999999970	0.999999971	0.999999973	0.999999974	0.999999976	0.999999977
5.6	0.999999979	0.999999980	0.999999981	0.999999982	0.999999983	0.999999984	0.999999985	0.999999986	0.999999986	0.999999987
5.7	0.999999988	0.999999989	0.999999989	0.999999990	0.999999991	0.999999991	0.999999992	0.999999992	0.999999993	0.999999993
5.8	0.999999993	0.999999994	0.999999994	0.999999994	0.999999995	0.999999995	0.999999995	0.999999996	0.999999996	0.999999996
5.9	0.999999996	0.999999997	0.999999997	0.999999997	0.999999997	0.999999997	0.999999997	0.999999998	0.999999998	0.999999998
6	0.999999998	0.999999998	0.999999998	0.999999998	0.999999998	0.999999999	0.999999999	0.999999999	0.999999999	0.999999999

Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)



Process control & ppm level (without any shift in the mean)

σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	-	992021.242	984043.292	976066.947	968093.002	960122.253	952155.495	944193.520	936237.121	928287.087
0.1	920344.209	912409.272	904483.059	896566.354	888659.935	880764.577	872881.053	865010.133	857152.581	849309.160
0.2	841480.626	833667.732	825871.227	818091.854	810330.351	802587.452	794863.885	787160.372	779477.628	771816.365
0.3	764177.285	756561.087	748968.461	741400.091	733856.654	726338.820	718847.251	711382.602	703945.521	696536.645
0.4	689156.607	681806.029	674485.526	667195.704	659937.160	652710.482	645516.252	638355.038	631227.403	624133.897
0.5	617075.065	610051.439	603063.542	596111.887	589196.979	582319.310	575479.365	568677.616	561914.528	555190.551
0.6	548506.130	541861.695	535257.668	528694.460	522172.470	515692.087	509253.691	502857.649	496504.317	490194.041
0.7	483927.157	477703.988	471524.847	465390.037	459299.847	453254.559	447254.442	441299.752	435390.738	429527.635
0.8	423710.668	417940.051	412215.988	406538.670	400908.278	395324.984	389788.947	384300.315	378859.228	373465.811
0.9	368120.183	362822.450	357572.707	352371.040	347217.525	342112.224	337055.195	332046.480	327086.115	322174.123
1	317310.520	312495.309	307728.488	303010.040	298339.942	293718.162	289144.655	284619.371	280142.249	275713.219
1.1	271332.203	266999.113	262713.854	258476.322	254286.403	250143.978	246048.916	242001.083	238000.332	234046.512
1.2	230139.463	226279.018	222465.002	218697.234	214975.524	211299.678	207669.494	204084.762	200545.267	197050.789
1.3	193601.099	190195.964	186835.145	183518.396	180245.468	177016.103	173830.042	170687.016	167586.756	164528.985
1.4	161513.423	158539.783	155607.777	152717.110	149867.486	147058.601	144290.151	141561.825	138873.313	136224.297
1.5	133614.458	131043.474	128511.019	126016.767	123560.385	121141.542	118759.901	116415.125	114106.874	111834.807
1.6	109598.579	107397.846	105232.260	103101.475	101005.139	98942.902	96914.413	94919.318	92957.265	91027.898
1.7	89130.864	87265.806	85432.369	83630.198	81858.936	80118.227	78407.716	76727.045	75075.861	73453.808
1.8	71860.531	70295.676	68758.891	67249.822	65768.117	64313.426	62885.400	61483.690	60107.948	58757.828
1.9	57432.986	56133.078	54857.763	53606.700	52379.551	51175.980	49995.650	48838.230	47703.388	46590.795
2	45500.124	44431.050	43383.249	42356.402	41350.189	40364.296	39398.407	38452.212	37525.402	36617.671
2.1	35728.715	34858.232	34005.924	33171.494	32354.651	31555.101	30772.559	30006.739	29257.358	28524.136
2.2	27806.798	27105.069	26418.678	25747.357	25090.840	24448.867	23821.176	23207.513	22607.622	22021.255
2.3	21448.162	20888.100	20340.828	19806.106	19283.699	18773.375	18274.903	17788.058	17312.615	16848.354
2.4	16395.058	15952.511	15520.502	15098.822	14687.265	14285.629	13893.714	13511.322	13138.259	12774.334
2.5	12419.360	12073.149	11735.521	11406.294	11085.292	10772.341	10467.269	10169.908	9880.092	9597.657
2.6	9322.444	9054.293	8793.051	8538.565	8290.684	8049.261	7814.152	7585.215	7362.309	7145.298
2.7	6934.046	6728.422	6528.295	6333.539	6144.027	5959.637	5780.249	5605.744	5436.007	5270.923
2.8	5110.381	4954.272	4802.489	4654.926	4511.480	4372.051	4236.540	4104.849	3976.883	3852.551
2.9	3731.760	3614.422	3500.449	3389.756	3282.259	3177.876	3076.528	2978.135	2882.622	2789.913
3	2699.934	2612.615	2527.885	2445.676	2365.920	2288.552	2213.508	2140.725	2070.143	2001.702



This table gives the rejection (in terms of parts per million) of the process for a given level of process control. The level of control is given in terms of multiples of sigma.

E.g.: An engineer wants to estimate the ppm of a process whose level of process control is 3.56σ (i.e. $\pm 3.56\sigma$ of the total variation/spread is within the tolerance) This is at times called the process sigma.

The engineer can refer the row corresponding to $\sigma=3.5$ and read the value corresponding to column=0.06 to get the yield of the process. For the process under consideration, the rejection (ppm) is 370.935 parts per million

Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)



Process control & ppm level (without any shift in the mean) [continued]

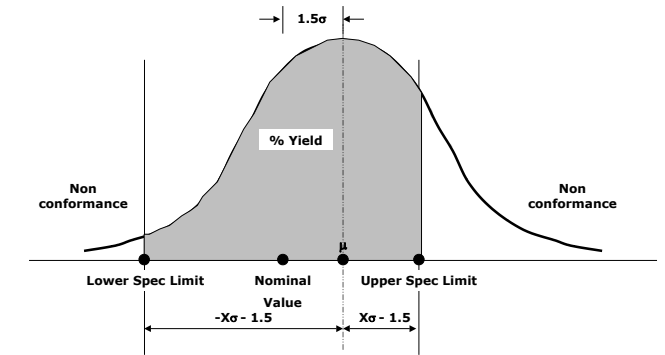
σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
3.1	1935.342	1871.009	1808.645	1748.197	1689.612	1632.837	1577.823	1524.520	1472.881	1422.857
3.2	1374.404	1327.477	1282.032	1238.027	1195.421	1154.173	1114.244	1075.595	1038.190	1001.992
3.3	966.965	933.075	900.289	868.573	837.895	808.226	779.533	751.789	724.964	699.031
3.4	673.962	649.730	626.312	603.680	581.812	560.682	540.270	520.551	501.505	483.111
3.5	465.347	448.194	431.632	415.644	400.210	385.312	370.935	357.060	343.671	330.754
3.6	318.291	306.270	294.674	283.491	272.707	262.308	252.281	242.615	233.297	224.316
3.7	215.660	207.319	199.281	191.537	184.076	176.889	169.967	163.300	156.879	150.697
3.8	144.745	139.014	133.498	128.189	123.079	118.161	113.429	108.877	104.497	100.284
3.9	96.231	92.334	88.585	84.981	81.516	78.185	74.983	71.905	68.946	66.104
4	63.372	60.748	58.226	55.804	53.478	51.243	49.098	47.038	45.059	43.160
4.1	41.337	39.588	37.908	36.297	34.751	33.267	31.844	30.478	29.169	27.913
4.2	26.708	25.553	24.446	23.384	22.367	21.391	20.457	19.561	18.702	17.880
4.3	17.092	16.337	15.614	14.922	14.259	13.624	13.016	12.434	11.877	11.344
4.4	10.834	10.346	9.878	9.431	9.004	8.594	8.203	7.829	7.471	7.129
4.5	6.802	6.489	6.190	5.904	5.631	5.370	5.120	4.882	4.654	4.437
4.6	4.229	4.031	3.841	3.661	3.488	3.323	3.166	3.015	2.872	2.735
4.7	2.605	2.480	2.361	2.248	2.140	2.037	1.938	1.845	1.755	1.670
4.8	1.589	1.511	1.437	1.367	1.300	1.236	1.175	1.118	1.062	1.010
4.9	0.960	0.912	0.867	0.824	0.782	0.743	0.706	0.671	0.637	0.605
5	0.574	0.545	0.518	0.491	0.466	0.443	0.420	0.398	0.378	0.359
5.1	0.340	0.323	0.306	0.290	0.275	0.261	0.247	0.235	0.222	0.211
5.2	0.200	0.189	0.179	0.170	0.161	0.152	0.144	0.137	0.129	0.123
5.3	0.116	0.110	0.104	0.098	0.093	0.088	0.083	0.079	0.075	0.071
5.4	0.067	0.063	0.060	0.056	0.053	0.050	0.048	0.045	0.043	0.040
5.5	0.038	0.036	0.034	0.032	0.030	0.029	0.027	0.026	0.024	0.023
5.6	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.014	0.014	0.013
5.7	0.012	0.011	0.011	0.010	0.009	0.009	0.008	0.008	0.007	0.007
5.8	0.007	0.006	0.006	0.006	0.005	0.005	0.005	0.004	0.004	0.004
5.9	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002
6	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001

Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)



Process control & yield (with 1.5σ shift in the mean)

σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	-	0.002590412	0.005181147	0.007772529	0.010364883	0.012958530	0.015553792	0.018150993	0.020750451	0.023352488
0.1	0.025957422	0.028565570	0.031177248	0.033792771	0.036412452	0.039036601	0.041665528	0.044299539	0.046938940	0.049584033
0.2	0.052235118	0.054892491	0.057556449	0.060227282	0.062905279	0.065590726	0.068283904	0.070985094	0.073694570	0.076412605
0.3	0.079139466	0.081875418	0.084620721	0.087375631	0.090140400	0.092915276	0.095700501	0.098496316	0.101302953	0.104120643
0.4	0.106949609	0.109790071	0.112642243	0.115506336	0.118382552	0.121271091	0.124172146	0.127085905	0.130012550	0.132952257
0.5	0.135905198	0.138871537	0.141851433	0.144845039	0.147852503	0.150873964	0.153909559	0.156959414	0.160023652	0.163102389
0.6	0.166195734	0.169303790	0.172426652	0.175564410	0.178717148	0.181884941	0.185067860	0.188265965	0.191479315	0.194707957
0.7	0.197951935	0.201211283	0.204486030	0.207776198	0.211081801	0.214402846	0.217739336	0.221091262	0.224458613	0.227841367
0.8	0.231239497	0.234652970	0.238081744	0.241525771	0.244984996	0.248459356	0.251948783	0.255453201	0.258972527	0.262506670
0.9	0.266055536	0.269619020	0.273197013	0.276789397	0.280396050	0.284016840	0.287651632	0.291300283	0.294962641	0.298638552
1	0.302327853	0.306030374	0.309745941	0.313474372	0.317215480	0.320969071	0.324734945	0.328512898	0.332302717	0.336104186
1.1	0.339917082	0.343741176	0.347576235	0.351422019	0.355278284	0.359144779	0.363021251	0.366907438	0.370803076	0.374707895
1.2	0.378621619	0.382543971	0.386474666	0.390413417	0.394359929	0.398313908	0.402275051	0.406243055	0.410217610	0.414198404
1.3	0.418185122	0.422177444	0.426175046	0.430177604	0.434184787	0.438196263	0.442211698	0.446230753	0.450253088	0.454278360
1.4	0.458306224	0.462336333	0.466368336	0.470401882	0.474436618	0.478472189	0.482508237	0.486544406	0.490580335	0.494615665
1.5	0.498650033	0.502683071	0.506714411	0.510743689	0.514770539	0.518794598	0.522815499	0.526832878	0.530846368	0.534855606
1.6	0.538860224	0.542859860	0.546854148	0.550842724	0.554825227	0.558801293	0.562770562	0.566732673	0.570687269	0.574633991
1.7	0.578572485	0.582502396	0.586423371	0.590335060	0.594237114	0.598129187	0.602010935	0.605882016	0.609742091	0.613590822
1.8	0.617427875	0.621252919	0.625065625	0.628865668	0.632652725	0.636426477	0.640186608	0.643932804	0.647664758	0.651382162
1.9	0.655084716	0.658772120	0.662444081	0.666100308	0.669740514	0.673364418	0.676971739	0.680562205	0.684135546	0.687691496
2	0.691229794	0.694750184	0.698252413	0.701736235	0.705201406	0.708647689	0.712074850	0.715482662	0.718870901	0.722239348
2.1	0.725587789	0.728916018	0.732223829	0.735511025	0.738777412	0.742022802	0.745247014	0.748449868	0.751631193	0.754790821
2.2	0.757928591	0.761044347	0.764137936	0.767209213	0.770258038	0.773284276	0.776287796	0.779268474	0.782226191	0.785160834
2.3	0.788072294	0.790960467	0.793825257	0.796666571	0.799484322	0.802278427	0.805048812	0.807795404	0.810518138	0.813216953
2.4	0.815891793	0.818542608	0.821169354	0.823771989	0.826350480	0.828904795	0.831434911	0.833940808	0.836422469	0.838879887
2.5	0.841313054	0.843721972	0.846106643	0.848467078	0.850803290	0.853115297	0.855403123	0.857666796	0.859906346	0.862121810
2.6	0.864313230	0.866480650	0.868624119	0.870743691	0.872839423	0.874911378	0.876959620	0.878984219	0.880985250	0.882962787
2.7	0.884916914	0.886847714	0.888755276	0.890639691	0.892501055	0.894339465	0.896155025	0.897947839	0.899718015	0.901465666
2.8	0.903190904	0.904893849	0.906574620	0.908233341	0.909870137	0.911485136	0.913078471	0.914650275	0.916200683	0.917729835
2.9	0.919237872	0.920724936	0.922191172	0.923636729	0.925061755	0.926466402	0.927850823	0.929215173	0.930559608	0.931884287
3	0.933189370	0.934475019	0.935741396	0.936988665	0.938216992	0.939426544	0.940617489	0.941789996	0.942944236	0.944080378



This table gives the yield of the process for a given level of process control. **The long-term shift in the process mean of 1.5σ is considered.** The level of control is given in terms of multiples of sigma.

E.g.: An engineer wants to estimate the yield of a process whose level of process control is 3.56σ (i.e. +/- 3.56 σ of the total variation/spread is within the tolerance) This is at times called the process sigma.

The engineer can refer the row corresponding to σ=3.5 and read the value corresponding to column=0.06 to get the yield of the process. For the process under consideration, the yield is 0.980300587 (98.03% approximately)

Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)



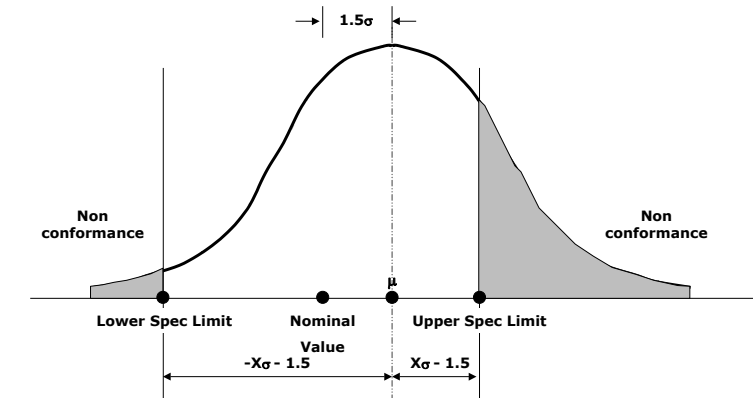
Process control & yield (with 1.5 σ shift in the mean) [continued]

σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
3.1	0.945198596	0.946299062	0.947381949	0.948447432	0.949495687	0.950526888	0.951541211	0.952538833	0.953519932	0.954484683
3.2	0.955433266	0.956365857	0.957282635	0.958183777	0.959069462	0.959939868	0.960795173	0.961635555	0.962461192	0.963272261
3.3	0.964068940	0.964851406	0.965619836	0.966374406	0.967115291	0.967842669	0.968556712	0.969257596	0.969945495	0.970620581
3.4	0.971283027	0.971933005	0.972570685	0.973196238	0.973809833	0.974411639	0.975001822	0.975580550	0.976147987	0.976704300
3.5	0.977249651	0.977784203	0.978308117	0.978821554	0.979324672	0.979817631	0.980300587	0.980773695	0.981237110	0.981690985
3.6	0.982135472	0.982570723	0.982996885	0.983414108	0.983822537	0.984222319	0.984613597	0.984996513	0.985371210	0.985737827
3.7	0.986096501	0.986447371	0.986790572	0.987126237	0.987454499	0.987775490	0.988089340	0.988396175	0.988696124	0.988989311
3.8	0.989275861	0.989555895	0.989829534	0.990096898	0.990358104	0.990613269	0.990862507	0.991105932	0.991343655	0.991575788
3.9	0.991802438	0.992023713	0.992239719	0.992450561	0.992656341	0.992857160	0.993053119	0.993244317	0.993430849	0.993612813
4	0.993790301	0.993963407	0.994132223	0.994296837	0.994457339	0.994613815	0.994766352	0.994915033	0.995059942	0.995201160
4.1	0.995338767	0.995472843	0.995603465	0.995730709	0.995854650	0.995975361	0.996092916	0.996207385	0.996318839	0.996427345
4.2	0.996532971	0.996635783	0.996735847	0.996833226	0.996927982	0.997020177	0.997109871	0.997197124	0.997281993	0.997364535
4.3	0.997444806	0.997522861	0.997598753	0.997672534	0.997744257	0.997813972	0.997881728	0.997947573	0.998011556	0.998073723
4.4	0.998134118	0.998192787	0.998249774	0.998305121	0.998358869	0.998411061	0.998461735	0.998510931	0.998558688	0.998605043
4.5	0.998650032	0.998693691	0.998736056	0.998777161	0.998817039	0.998855723	0.998893245	0.998929637	0.998964928	0.998999149
4.6	0.999032328	0.999064495	0.999095677	0.999125901	0.999155194	0.999183581	0.999211088	0.999237739	0.999263559	0.999288571
4.7	0.999312798	0.999336261	0.999358984	0.999380986	0.999402289	0.999422913	0.999442878	0.999462202	0.999480905	0.999499004
4.8	0.999516517	0.999533462	0.999549856	0.999565714	0.999581052	0.999595887	0.999610233	0.999624105	0.999637518	0.999650485
4.9	0.999663019	0.999675135	0.999686844	0.999698160	0.999709094	0.999719659	0.999729865	0.999739724	0.999749247	0.999758445
5	0.999767327	0.999775903	0.999784184	0.999792178	0.999799895	0.999807344	0.999814533	0.999821470	0.999828164	0.999834623
5.1	0.999840854	0.999846865	0.999852663	0.999858254	0.999863647	0.999868846	0.999873859	0.999878692	0.999883351	0.999887842
5.2	0.999892170	0.999896341	0.999900359	0.999904232	0.999907962	0.999911555	0.999915017	0.999918350	0.999921560	0.999924651
5.3	0.999927628	0.999930493	0.999933251	0.999935906	0.999938461	0.999940919	0.999943285	0.999945562	0.999947752	0.999949858
5.4	0.999951884	0.999953833	0.999955707	0.999957509	0.999959242	0.999960908	0.999962509	0.999964048	0.999965527	0.999966948
5.5	0.999968314	0.999969626	0.999970887	0.999972098	0.999973261	0.999974378	0.999975451	0.999976481	0.999977470	0.999978420
5.6	0.999979331	0.999980206	0.999981046	0.999981852	0.999982625	0.999983367	0.999984078	0.999984761	0.999985416	0.999986044
5.7	0.999986646	0.999987223	0.999987777	0.999988308	0.999988817	0.999989304	0.999989772	0.999990220	0.999990649	0.999991060
5.8	0.999991454	0.999991831	0.999992193	0.999992539	0.999992870	0.999993188	0.999993492	0.999993783	0.999994061	0.999994328
5.9	0.999994583	0.999994827	0.999995061	0.999995284	0.999995498	0.999995703	0.999995898	0.999996086	0.999996264	0.999996436
6	0.999996599	0.999996756	0.999996905	0.999997048	0.999997185	0.999997315	0.999997440	0.999997559	0.999997673	0.999997782

Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)

Process control & PPM level (with 1.5σ shift in mean)

σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	-	997409.588	994818.853	992227.471	989635.117	987041.470	984446.208	981849.007	979249.549	976647.512
0.1	974042.578	971434.430	968822.752	966207.229	963587.548	960963.399	958334.472	955700.461	953061.060	950415.967
0.2	947764.882	945107.509	942443.551	939772.718	937094.721	934409.274	931716.096	929014.906	926305.430	923587.395
0.3	920860.534	918124.582	915379.279	912624.369	909859.600	907084.724	904299.499	901503.684	898697.047	895879.357
0.4	893050.391	890209.929	887357.757	884493.664	881617.448	878728.909	875827.854	872914.095	869987.450	867047.743
0.5	864094.802	861128.463	858148.567	855154.961	852147.497	849126.036	846090.441	843040.586	839976.348	836897.611
0.6	833804.266	830696.210	827573.348	824435.590	821282.852	818115.059	814932.140	811734.035	808520.685	805292.043
0.7	802048.065	798788.717	795513.970	792223.802	788918.199	785597.154	782260.664	778908.738	775541.387	772158.633
0.8	768760.503	765347.030	761918.256	758474.229	755015.004	751540.644	748051.217	744546.799	741027.473	737493.330
0.9	733944.464	730380.980	726802.987	723210.603	719603.950	715983.160	712348.368	708699.717	705037.359	701361.448
1	697672.147	693969.626	690254.059	686525.628	682784.520	679030.929	675265.055	671487.102	667697.283	663895.814
1.1	660082.918	656258.824	652423.765	648577.981	644721.716	640855.221	636978.749	633092.562	629196.924	625292.105
1.2	621378.381	617456.029	613525.334	609586.583	605640.071	601686.092	597724.949	593756.945	589782.390	585801.596
1.3	581814.878	577822.556	573824.954	569822.396	565815.213	561803.737	557788.302	553769.247	549746.912	545721.640
1.4	541693.776	537663.667	533631.664	529598.118	525563.382	521527.811	517491.763	513455.594	509419.665	505384.335
1.5	501349.967	497316.929	493285.589	489256.311	485229.461	481205.402	477184.501	473167.122	469153.632	465144.394
1.6	461139.776	457140.140	453145.852	449157.276	445174.773	441198.707	437229.438	433267.327	429312.731	425366.009
1.7	421427.515	417497.604	413576.629	409664.940	405762.886	401870.813	397989.065	394117.984	390257.909	386409.178
1.8	382572.125	378747.081	374934.375	371134.332	367347.275	363573.523	359813.392	356067.196	352335.242	348617.838
1.9	344915.284	341227.880	337555.919	333899.692	330259.486	326635.582	323028.261	319437.795	315864.454	312308.504
2	308770.206	305249.816	301747.587	298263.765	294798.594	291352.311	287925.150	284517.338	281129.099	277760.652
2.1	274412.211	271083.982	267776.171	264488.975	261222.588	257977.198	254752.986	251550.132	248368.807	245209.179
2.2	242071.409	238955.653	235862.064	232790.787	229741.962	226715.724	223712.204	220731.526	217773.809	214839.166
2.3	211927.706	209039.533	206174.743	203333.429	200515.678	197721.573	194951.188	192204.596	189481.862	186783.047
2.4	184108.207	181457.392	178830.646	176228.011	173649.520	171095.205	168565.089	166059.192	163577.531	161120.113
2.5	158686.946	156278.028	153893.357	151532.922	149196.710	146884.703	144596.877	142333.204	140093.654	137878.190
2.6	135686.770	133519.350	131375.881	129256.309	127160.577	125088.622	123040.380	121015.781	119014.750	117037.213
2.7	115083.086	113152.286	111244.724	109360.309	107498.945	105660.535	103844.975	102052.161	100281.985	98534.334
2.8	96809.096	95106.151	93425.380	91766.659	90129.863	88514.864	86921.529	85349.725	83799.317	82270.165
2.9	80762.128	79275.064	77808.828	76363.271	74938.245	73533.598	72149.177	70784.827	69440.392	68115.713
3	66810.630	65524.981	64258.604	63011.335	61783.008	60573.456	59382.511	58210.004	57055.764	55919.622



This table gives the rejection (in terms of parts per million) of the process for a given level of process control. **The long-term shift in the process mean of 1.5σ is considered.** The level of control is given in terms of multiples of sigma.

E.g.: An engineer wants to estimate the ppm of a process whose level of process control is 3.56σ (i.e. +/- 3.56 σ of the total variation/spread is within the tolerance) This is at times called the process sigma.

The engineer can refer the row corresponding to σ=3.5 and read the value corresponding to column=0.06 to get the yield of the process. For the process under consideration, the rejection (ppm) is 19699.413 parts per million

Process Control Levels and Rejection (With and without 1.5 sigma shift in the process mean)



Process control & PPM level (with 1.5σ shift in mean) [continued]

σ	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
3.1	54801.404	53700.938	52618.051	51552.568	50504.313	49473.112	48458.789	47461.167	46480.068	45515.317
3.2	44566.734	43634.143	42717.365	41816.223	40930.538	40060.132	39204.827	38364.445	37538.808	36727.739
3.3	35931.060	35148.594	34380.164	33625.594	32884.709	32157.331	31443.288	30742.404	30054.505	29379.419
3.4	28716.973	28066.995	27429.315	26803.762	26190.167	25588.361	24998.178	24419.450	23852.013	23295.700
3.5	22750.349	22215.797	21691.883	21178.446	20675.328	20182.369	19699.413	19226.305	18762.890	18309.015
3.6	17864.528	17429.277	17003.115	16585.892	16177.463	15777.681	15386.403	15003.487	14628.790	14262.173
3.7	13903.499	13552.629	13209.428	12873.763	12545.501	12224.510	11910.660	11603.825	11303.876	11010.689
3.8	10724.139	10444.105	10170.466	9903.102	9641.896	9386.731	9137.493	8894.068	8656.345	8424.212
3.9	8197.562	7976.287	7760.281	7549.439	7343.659	7142.840	6946.881	6755.683	6569.151	6387.187
4	6209.699	6036.593	5867.777	5703.163	5542.661	5386.185	5233.648	5084.967	4940.058	4798.840
4.1	4661.233	4527.157	4396.535	4269.291	4145.350	4024.639	3907.084	3792.615	3681.161	3572.655
4.2	3467.029	3364.217	3264.153	3166.774	3072.018	2979.823	2890.129	2802.876	2718.007	2635.465
4.3	2555.194	2477.139	2401.247	2327.466	2255.743	2186.028	2118.272	2052.427	1988.444	1926.277
4.4	1865.882	1807.213	1750.226	1694.879	1641.131	1588.939	1538.265	1489.069	1441.312	1394.957
4.5	1349.968	1306.309	1263.944	1222.839	1182.961	1144.277	1106.755	1070.363	1035.072	1000.851
4.6	967.672	935.505	904.323	874.099	844.806	816.419	788.912	762.261	736.441	711.429
4.7	687.202	663.739	641.016	619.014	597.711	577.087	557.122	537.798	519.095	500.996
4.8	483.483	466.538	450.144	434.286	418.948	404.113	389.767	375.895	362.482	349.515
4.9	336.981	324.865	313.156	301.840	290.906	280.341	270.135	260.276	250.753	241.555
5	232.673	224.097	215.816	207.822	200.105	192.656	185.467	178.530	171.836	165.377
5.1	159.146	153.135	147.337	141.746	136.353	131.154	126.141	121.308	116.649	112.158
5.2	107.830	103.659	99.641	95.768	92.038	88.445	84.983	81.650	78.440	75.349
5.3	72.372	69.507	66.749	64.094	61.539	59.081	56.715	54.438	52.248	50.142
5.4	48.116	46.167	44.293	42.491	40.758	39.092	37.491	35.952	34.473	33.052
5.5	31.686	30.374	29.113	27.902	26.739	25.622	24.549	23.519	22.530	21.580
5.6	20.669	19.794	18.954	18.148	17.375	16.633	15.922	15.239	14.584	13.956
5.7	13.354	12.777	12.223	11.692	11.183	10.696	10.228	9.780	9.351	8.940
5.8	8.546	8.169	7.807	7.461	7.130	6.812	6.508	6.217	5.939	5.672
5.9	5.417	5.173	4.939	4.716	4.502	4.297	4.102	3.914	3.736	3.564
6	3.401	3.244	3.095	2.952	2.815	2.685	2.560	2.441	2.327	2.218