


SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com

Product Specification Report					
PART NO.	TITLE	PRODUCT SPEC.	DWG. NO.	REQUESTER	PAGES
WCT001-MCT	CRIMP TOOL	OPS-045	N/A	SULLINS	10
TYPE		TESTED BY	REVIEWED BY	DATE	PAGES
PRODUCT SPECIFICATION		JG	KOS	5-15-2015	10

REVISION HISTORY

DATE	REV	DESCRIPTION	INITIATED BY
5-15-2015	A	INITIAL RELEASE	JG
6/24/2022	B0	Rework SWT204 In Progress	TT



CERTIFICATION

This is to certify that the evaluation described herein was designed and executed by personnel of Sullins Connector Solutions of San Marcos California.

All equipment and measuring instruments used during testing were calibrated and traceable to NIST according to ISO/IEC 17025:2005 and ANSI-Z540-1, as applicable.

All data, raw and summarized, analysis and conclusions present herein are the property of Sullins Connector Solutions. No copy of this report, except in full, shall be forwarded to any agency, customer, etc., without the written approval of Sullins Connector Solutions.

SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com

CRIMP TOOL PART NUMBER: WCT001-MCT

This tool will crimp 3 different connectors as follows:

~~SWT204 (DWG 11627);~~ Currently is not working condition, in the progress of rework.

SWT201 (DWG 11621);

SWT25X (DWG 11631).

Terminal No.	Wire Size		Conductor crimp		Insulator Crimp		Pull force Min.
			Height	Width	Height	Width	
	AWG	O.D.	mm	mm	mm	mm	Kgf
SWT204	22	1.76	0.70-0.80	1.32 max.	1.50-1.60	1.80 max.	3.6
	24	1.60	0.70-0.80	1.30 max.	1.48-1.58	1.75 max.	2.7
	26	1.48	0.65-0.75	1.30 max.	1.40-1.50	1.75 max.	1.8

Terminal No.	Wire Size		Conductor crimp		Insulator Crimp		Pull force Min.
			Height	Width	Height	Width	
	AWG	O.D.	mm	mm	mm	mm	Kgf
SWT201	24	1.60	0.69-0.79	1.29 max.	1.43-1.53	1.64 max.	3.0
	26	1.48	0.66-0.76	1.29 max.	1.40-1.50	1.64 max.	2.0
	28	1.20	0.63-0.73	1.28 max.	1.40-1.50	1.59 max.	1.0

Terminal No.	Wire Size		Conductor crimp		Insulator Crimp		Pull force Min.
			Height	Width	Height	Width	
	AWG	O.D.	mm	mm	mm	mm	Kgf
SWT25X	20	1.94	0.97-1.07	1.51 max.	1.73-1.83	1.90 max.	5.9
	22	1.76	0.84-0.94	1.49 max.	1.56-1.66	1.86 max.	3.6
	24	1.60	0.79-0.89	1.48 max.	1.50-1.60	1.82 max.	2.7
	26	1.48	0.77-0.87	1.47 max.	1.45-1.55	1.80 max.	1.8

Performance:

Crimping Tool with 4 nests.

2 nests are used for connector SWT25X and one each for the remaining connectors.

Test:

A crimp test was performed and cross section pictures were made.

The crimp cycle is finished when the tool ratchet releases.

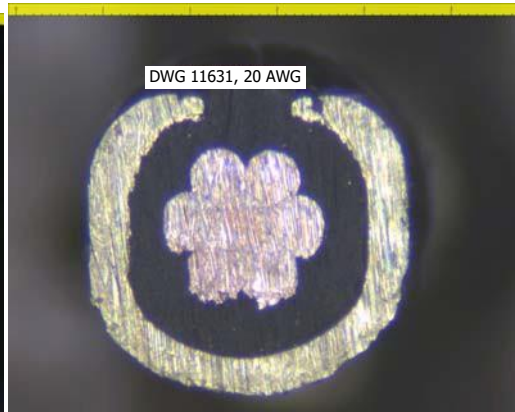
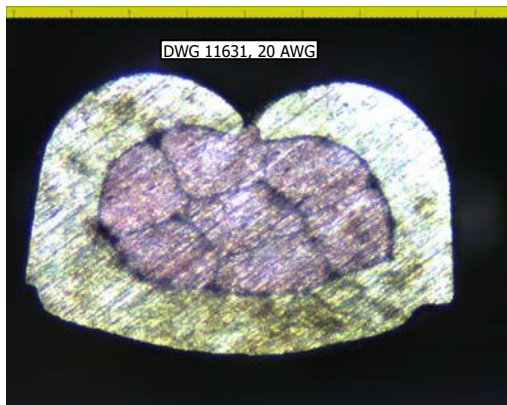
SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com

Tested by	O.S				Date		2011-05-04					
Tool reference	WCT001-MCT				Connector type							
Preload at start of test					Preload at end of test							
Nest / (marking)												
Test wire [mm² / AWG}	20AWG		22AWG		24AWG		26AWG		22AWG		24AWG	
Wire type	UL1007		UL1007		UL1007		UL1007		UL1007		UL1007	
Contact / Terminal	SWT25X		SWT25X		SWT25X		SWT25X		SWT204		SWT204	
Crimp height [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	1,00		0,92		0,87		0,84		0,78		0,74	
Crimp width [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	1,50		1,47		1,45		1,45		1,28		1,26	
Insulation height [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	1,73		1,64		1,58		1,55		1,54		1,51	
Insulation width [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	1,81		1,79		1,73		1,72		1,72		1,71	
Tensile test / fail. mode ¹⁾	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C
1 [N]	79	W	58,5	W	49,5	W	30	W	84,5	W	58,5	W
2 [N]	82,5	W	65,5	W	48	W	27	W	84	W	58,5	W
3 [N]	81	W	76,5	W	48,5	W	37	W	76,5	W	57	W
Min required value according to customer	57,86		35,3		26,47		17,6		35,3		26,47	
Comments – nest												
Comments – tool												
Nest / (marking)												
Test wire [mm² / AWG}	26AWG		24AWG		26AWG		28AWG					
Wire type	UL1007		UL1007		UL1007		UL1007					
Contact / Terminal	SWT204		SWT201		SWT201		SWT201					
Bellmouth [mm]												
Crimp height [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	0,70		0,77		0,75		0,72					
Crimp width [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	1,25		1,26		1,25		1,25					
Insulation height [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	1,50		1,50		1,51		1,48					
Insulation width [mm]	[mm]		[mm]		[mm]		[mm]		[mm]		[mm]	
1 [mm]	1,70		1,56		1,57		1,56					
Tensile test / fail. mode ¹⁾	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C	[N]	P/W/C
1 [N]	35,5	W	53,5	W	38,5	W	21	W				
2 [N]	38	W	56,5	W	38,5	W	20	W				
3 [N]	38,5	W	56,5	W	37,5	W	23	W				
Min required value according to customer	17,6		26,47		17,6		9,8					
Comments – nest												
Comments – tool												

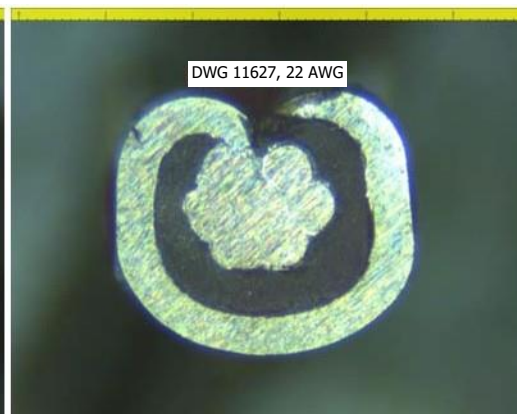
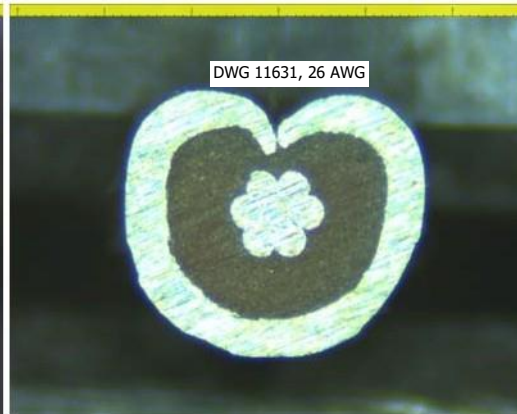
¹⁾ Records from the tensile tests are maximum pull-off value and failure mode. P = wire pull off from contact / terminal; W = wire break; C = connector / terminal break.

SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com

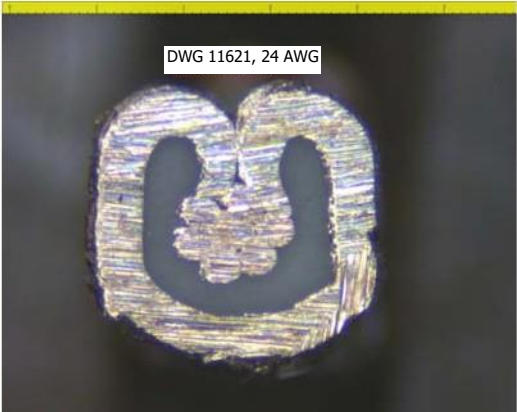
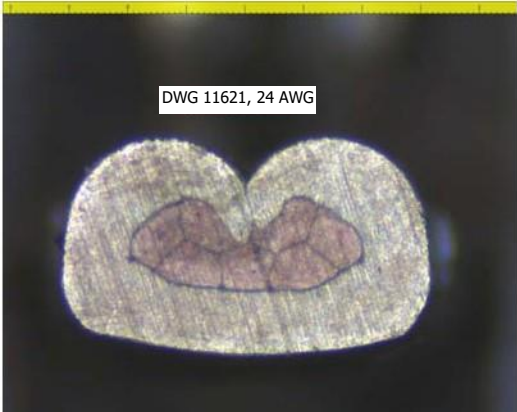
Cross Section Pictures:



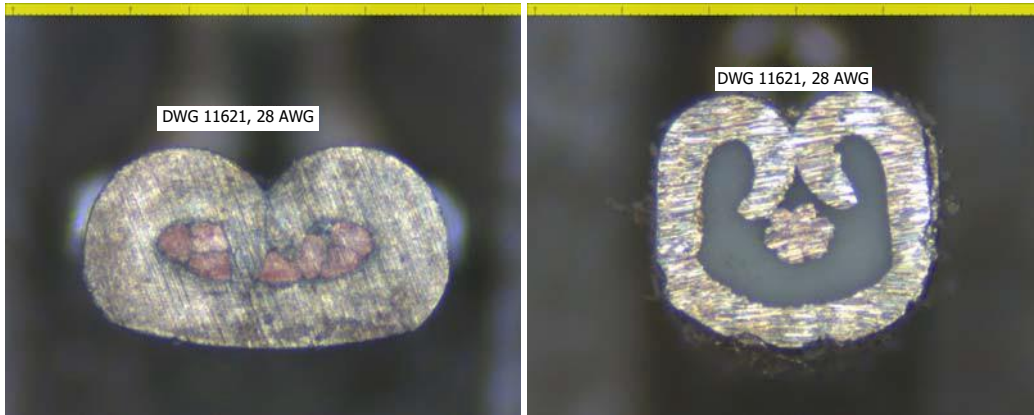
SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com



SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com



SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com



Conclusion:

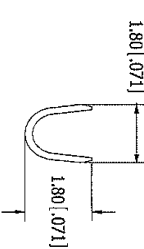
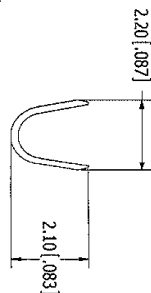
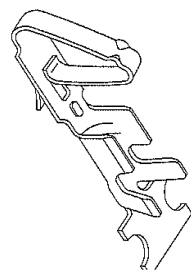
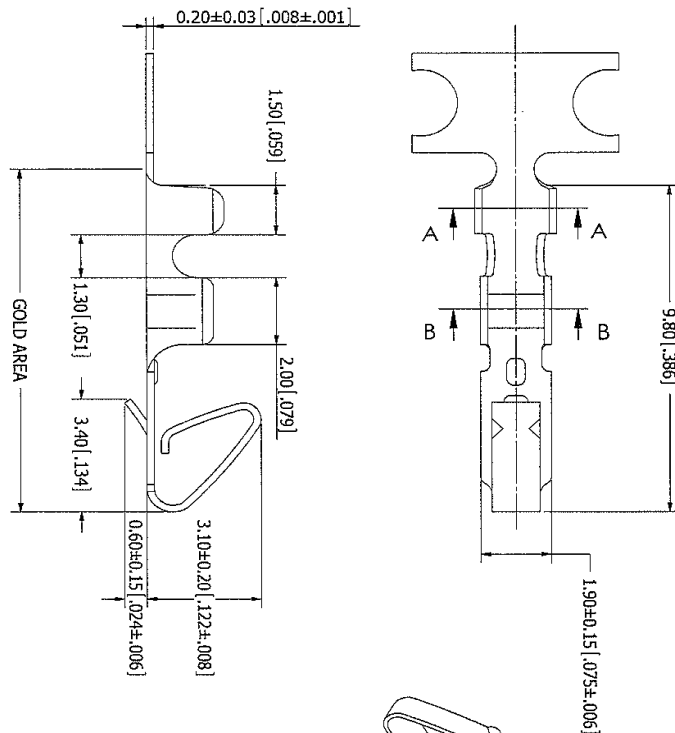
Cross section pictures of the insulation shows that the wings go through the insulation and hit the conductor. This happens even if the specification regarding height and width are fulfilled.

SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com

PART NUMBER CODING
SWT25X-U - C-S01-UU-UU

MATERIAL & PLATING

RT = BRASS, .000015" MIN NICKEL UNDERPLATE, .000040" MIN PURE TIN, BRIGHT OVERALL (NOTE 7).
PT = PHOSPHOR BRONZE, .000015" MIN NICKEL UNDERPLATE, .000040" MIN PURE TIN, BRIGHT OVERALL (NOTE 7).
RP = BRASS, .000040" MIN NICKEL UNDERPLATE, GOLD FLASH OVERALL.



- NOTES:**
1. MATERIAL: SEE PART NUMBER CODING.
 2. PLATING: SEE PART NUMBER CODING.
 3. WIRE RANGE: AWG #20 - #26.
 4. INSULATION O.D.: ϕ 1.35mm ~ ϕ 1.90mm.
 5. QUANTITY PER REEL = 10,000 PIECES.
 6. USED IN SWT25X SERIES HOUSING.
 7. PLATING BEFORE STAMPING/FORMING.



RoHS COMPLIANT

REVISIONS			
REV.	ECO. NO	DESCRIPTION	DATE
A	2237	INITIAL RELEASE	05/24/2011

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS.		TOLERANCES: ANGULAR: X° ± 0.3 (0.12)	
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-2009		PER ASME Y14.5M-2009	
DATE	NAME	DATE	NAME
05/24/2011	LH	05/24/2011	LH
TITLE: CRIMP TERMINAL - SWT25X		PART NUMBER: SWT25X-U - C-S01-UU-UU	
SHEET: 54453		TWC. NO.: 11631	
SCALE: 12:1		SHEET 1 OF 1	

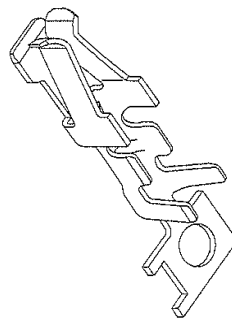
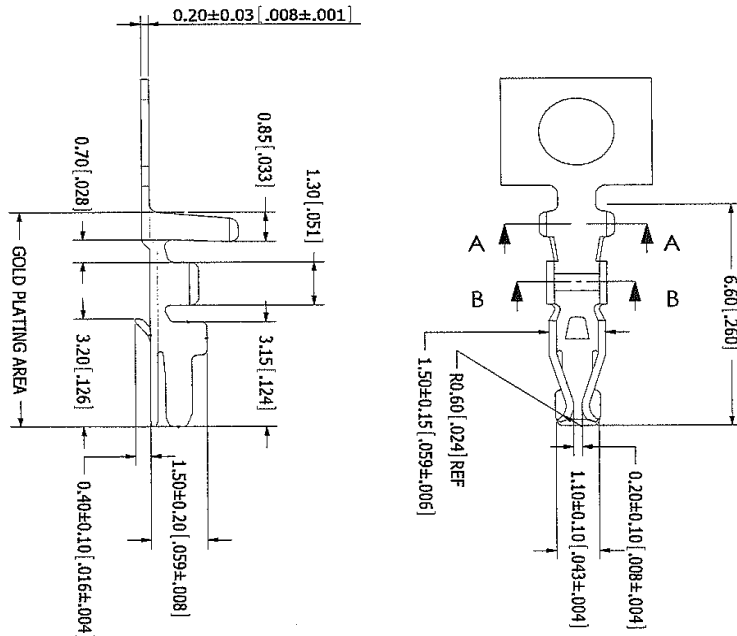
RENAME: Z:\COURTNEY\JAN\WEB\CAUTOM\INTO-C\ORIGINAL\H01\WATER ECO 2237\2237-1232 WATER 25X W/IN 1.401\SWT25X-UC-S01-UU-UPR06\2237

SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com

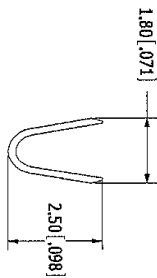
PART NUMBER CODING
SWT204-UP N-S01-UU-UU

PLATING

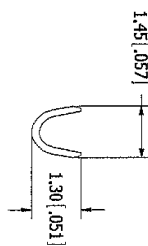
T = .000015" MIN NICKEL UNDERPLATE, .000040" MIN PURE TIN, BRIGHT OVERALL (NOTE 7)
P = .000040" MIN NICKEL UNDERPLATE, GOLD FLASH OVERALL.



SECTION A-A



SECTION B-B



NOTES:

1. MATERIAL: PHOSPHOR BRONZE.
2. PLATING: SEE PART NUMBER CODING.
3. WIRE RANGE: AVG #22 - #26.
4. INSULATION O.D.: ϕ 1.35mm \sim ϕ 1.70mm.
5. QUANTITY PER REEL = 10,000 PIECES.
6. USED IN SWH204 SERIES HOUSING.
7. PLATING BEFORE STAMPING/FORMING.



RoHS COMPLIANT

REVISIONS			
REV.	ECO. NO	DESCRIPTION	DATE
A	226	INITIAL RELEASE	05/24/2011

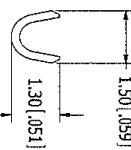
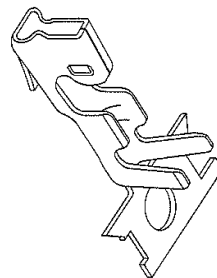
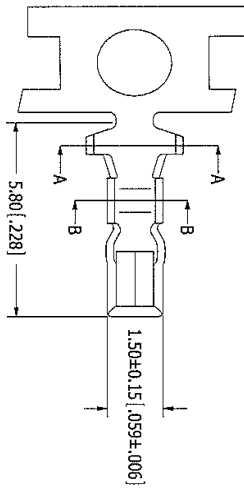
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS		DATE	NAME
TOLERANCES: ANGULAR XX ± 0.10 (1°)		05/24/2011	LI
XX ± 0.05 (0.5°)			
INTERPRET DIMENSIONS AND TOLERANCING PER ASME Y14.5M-2009			
TITLE		PART NUMBER	
CRIMP TERMINAL - SWH 204		SWT204-UP N-S01-UU-UU	
CAGE CODE		DWS. NO.	
C 54453		11627	
REV		SHEET 1 OF 1	
A			

SULLINS CONNECTOR SOLUTIONS
801 East Mission Road
San Marcos, CA 92069
760-744-0125
www.sullinscorp.com

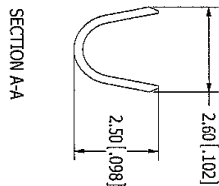
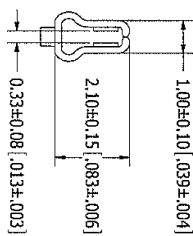
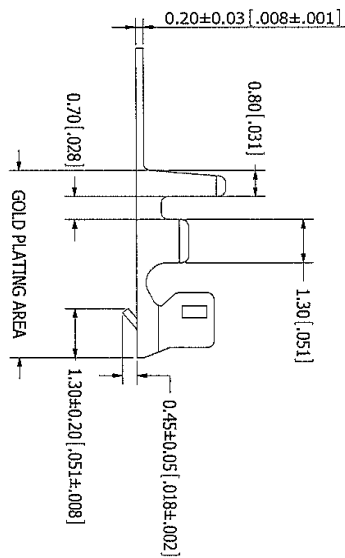
PART NUMBER CODING
SWT201-UP-N-S01-UU-UU

PLATING

T = .000015" MIN NICKEL UNDERPLATE, .000040" MIN PURE TIN, BRIGHT OVERALL (NOTE 7).
P = .000040" MIN. NICKEL UNDERPLATE, GOLD FLASH OVERALL.



SECTION B-B



SECTION A-A

- NOTES:**
1. MATERIAL: PHOSPHOR BRONZE.
 2. PLATING: SEE PART NUMBER CODING.
 3. WIRE RANGE: AWG #24 - #28.
 4. INSULATION O.D.: $\phi 1.20\text{mm} \sim \phi 1.50\text{mm}$.
 5. QUANTITY PER REEL = 10,000 PIECES.
 6. USED IN SWH201 SERIES HOUSING.
 7. PLATING BEFORE STAMPING/FORMING.



RoHS COMPLIANT

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES		DRAWN DATE NAME	
TOLERANCES: FRACTIONS: 1/16, 1/32, 1/64, 1/8, 1/4, 1/2, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018,			