



Innovations in Fluid Sealing.

# GASKET FAILURE CAN CRUSH YOUR BOTTOM LINE ...



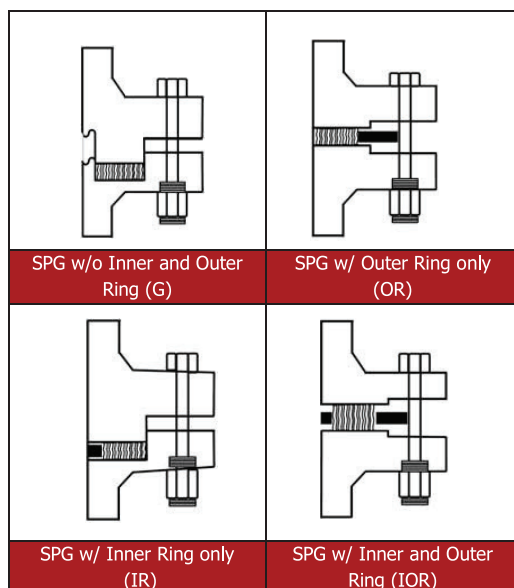
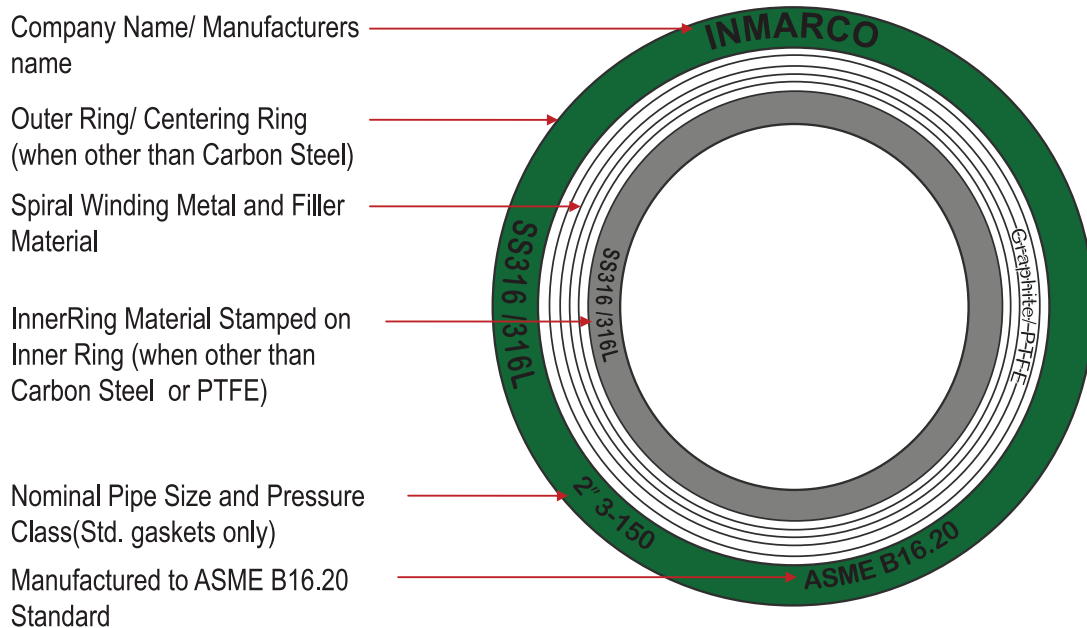
"Consolidated Gasket Brochure"



## SEMI - METALLIC GASKET

### SPIRAL WOUND GASKET

Spiral Wound Gasket is a sealing element with or without outer guide rings / inner rings . The sealing element consist of spirally wound strip filled with different types of fillers like Graphite/ PTFE/Ceramic etc., depending upon the nature and type of application. The picture below illustrates a typical arrangement of a spiral wound gasket. INMARCO manufactures different types of gaskets in different combinations and sizes of exotic materials like carbon steel, stainless steel, nickel and alloy steels. These gaskets are manufactured meeting the requirements of international specification such as ASME, DIN, JIS etc.



▶ SPG (G) – Wide choice of material for metal strip and filler ( Ceramic / Flexible Graphite / PTFE / Verdicarb (Mica Graphite). Suitable for high pressures and temperatures application. Recommended for flanges with tongue and groove.

▶ SPG (IR) – Consist of Solid metal inner ring. Suitable for high pressures and temperatures. Recommended for male and female flanges.

▶ SPG (OR) – Solid metal outer ring used as a centering device and compression stop. Recommended for Raised faced and flat face flanges.

▶ SPG (IOR) – Consist of metal inner and outer rings. Suitable for high pressures and temperatures applications. Prevents turbulence and erosion damage to flange. Prevents damage for gasket bore and inner windings. Acts as a corrosion barrier. Recommended for raised face or flat face flanges.

## TECHNICAL INFORMATION

### OUTER AND INNER RING STANDARD MATERIALS

Carbon Steel, Plated with Chrome Passivation or Painted
Stainless Steel 304/ 304L/317L/316/316L/321/347/410
Monel, Nickel, HASTELLOY® B, HASTELLOY® C276
Titanium, Inconel 600, Inconel 625

### TEMPERATURE LIMITS FOR FILLER MATERIAL

Material	Min. °C	Max. °C
Ceramic	-212	1090
Flexible Graphite	-212	510
PTFE	-240	260
Verdicarb (Mica Graphite)	-212	175

### STANDARD TOLERANCE FOR WINDINGS

Gasket Diameter	OD(mm)	ID(mm)
Up to 1.0"	+ 0.2mm -0	+0 -0.4
1.0 to 24.0"	+ 0.2mm -0	+0 -0.4
24.0 to 36.0"	+ 0.6mm -0	+0 -1.0
36.0 to 60.0"	+ 0.6mm -0	+0 -1.0
60.0" and above	+ 0.6mm -0	+0 -1.0

### TEMPERATURE LIMITS FOR COMMON METALS

Material	Min. °C	Max. °C	Abbreviation
304 Stainless Steel	-195	+760	304
316L Stainless Steel	-100	+760	316L
317L Stainless Steel	-100	+760	317L
321 Stainless Steel	-195	+760	321
347 Stainless Steel	-195	+925	347
Carbon Steel	-40	+540	CRS
20Cb-3 (Alloy 20)	-185	+760	A-20
HASTELLOY® B 2	-185	+1090	HAST B
HASTELLOY® C276	-185	+1090	HAST C
INCOLOY® 800	-100	+870	IN 800
INCOLOY® 825	-100	+870	IN 825
INCOLOY® 600	-100	+1090	INC 600
INCOLOY® 625	-100	+1090	INC 625
INCOLNEL® X750	-100	+1090	INX
MONEL 400	-130	+820	MON
NICKEL 200	-195	+760	NI
Titanium	-195	+1090	TI

### GASKET THICKNESS

Nominal Thickness	Compressed Thickness	Inner / Outer Ring Thickness
3.2 mm	2.3 – 2.5 mm	2.0 – 2.2 mm
4.5 mm	3.2 – 3.4 mm	3.0 – 3.3 mm
6.4 mm	4.6 – 4.9 mm	4.0 – 4.2 mm
7.2 mm	5.0 – 5.5 mm	5.0 – 5.5 mm

### Ordering Information:

Gasket Material	: Stainless Steel (SS) 304 /316 /316 etc
Filler	: Flexible Graphite / Ceramic / PTFE
Inner and Outer Ring	: Carbon Steel (CS) SS304 / SS316 / SS316L
Gasket Thickness	: 3.2mm / 4.5mm / 6.4mm / 7.2mm
Inner and Outer Ring Thickness (Compressed)	: 2.3mm / 3.2mm / 4.6mm / 5.0mm
Class	: 150# / 300# / 600# etc.
Size	: 1.0" 2.0" 3.0" – 24.0"
Standard	: ASME B16.20 / ASME B16.47 Series A / B

Example: INMARCO SS316 Spiral Wound Expanded Graphite Filled Gasket with SS316 Inner Ring and CS Outer Ring Size: 2.0" Class 150# Gasket Thick 4.5mm Ring Thick 3.2mm as per ASME B16.20

### Availability:

Material (Inner and Outer Ring) : SS304 / SS316 / SS316L / SS321 etc.,  
 Size: ½" to 24.0" Classes: 150# to 2500# larger sizes can be produced to order.  
 Other Spiral Wound Gasket Material and sizes available upon request.

SPIRAL WOUND GASKET DIMENSIONAL DATA TO SUIT ANSI STANDARD FLANGES AS PER ASME B16.20						
NPS (Inches)	Class 150 (mm)	Class 300 (mm)	Class 600 (mm)	Class 900 (mm)	Class 1500 (mm)	Class 2500 (mm)
1/2"	48 x 32 x 19 x 14	54 x 32 x 19 x 14	54 x 32 x 19 x 14	64 x 32 x 19 x 14	64 x 32 x 19 x 14	70 x 32 x 19 x 14
3/4"	57 x 40 x 25 x 21	67 x 40 x 25 x 21	67 x 40 x 25 x 21	70 x 40 x 25 x 21	70 x 40 x 25 x 21	76 x 40 x 25 x 21
1.0"	67 x 48 x 32 x 27	73 x 48 x 32 x 27	73 x 48 x 32 x 27	80 x 48 x 32 x 27	80 x 48 x 32 x 27	86 x 48 x 32 x 27
1 1/4"	76 x 60 x 48 x 38	83 x 60 x 48 x 38	83 x 60 x 48 x 38	89 x 60 x 40 x 33	89 x 60 x 40 x 33	105 x 60 x 40 x 33
1 1/2"	86 x 70 x 54 x 44	95 x 70 x 54 x 44	95 x 70 x 54 x 44	99 x 70 x 48 x 41	99 x 70 x 48 x 41	118 x 70 x 48 x 41
2.0"	105 x 86 x 70 x 56	111 x 86 x 70 x 56	111 x 86 x 70 x 56	143 x 86 x 59 x 52	143 x 86 x 59 x 52	146 x 86 x 59 x 52
2 1/2"	124 x 99 x 83 x 67	130 x 99 x 83 x 67	130 x 99 x 83 x 67	165 x 99 x 70 x 64	165 x 99 x 70 x 64	168 x 99 x 70 x 64
3.0"	137 x 121 x 102 x 81	149 x 121 x 102 x 81	149 x 121 x 102 x 79	168 x 121 x 95 x 79	175 x 121 x 92 x 79	197 x 121 x 92 x 79
4.0"	175 x 149 x 127 x 106	181 x 149 x 127 x 106	194 x 149 x 121 x 103	207 x 149 x 121 x 103	210 x 149 x 118 x 98	235 x 149 x 118 x 98
5.0"	197 x 178 x 156 x 132	216 x 178 x 156 x 132	241 x 178 x 148 x 128	248 x 178 x 148 x 128	254 x 178 x 143 x 124	279 x 178 x 143 x 124
6.0"	222 x 210 x 183 x 157	251 x 210 x 183 x 157	267 x 210 x 175 x 155	289 x 210 x 175 x 155	283 x 210 x 171 x 147	318 x 210 x 171 x 147
8.0"	279 x 264 x 233 x 216	308 x 264 x 233 x 216	321 x 264 x 226 x 206	359 x 257 x 222 x 197	353 x 257 x 216 x 197	387 x 257 x 216 x 197
10.0"	340 x 318 x 287 x 268	362 x 318 x 287 x 268	400 x 318 x 275 x 255	435 x 311 x 276 x 246	435 x 311 x 267 x 246	476 x 311 x 270 x 246
12.0"	410 x 375 x 340 x 318	422 x 375 x 340 x 318	457 x 375 x 327 x 307	499 x 368 x 324 x 292	521 x 368 x 324 x 292	549 x 368 x 318 x 292
14.0"	451 x 406 x 372 x 349	486 x 406 x 372 x 349	492 x 406 x 362 x 343	521 x 400 x 356 x 321	578 x 400 x 362 x 321	eg. (1/2" Class 150#)
16.0"	514 x 464 x 422 x 400	540 x 464 x 422 x 400	565 x 464 x 413 x 390	575 x 457 x 413 x 375	641 x 457 x 406 x 368	48.0mm (Outer Ring OD)
18.0"	549 x 527 x 475 x 449	597 x 527 x 475 x 449	613 x 527 x 470 x 438	638 x 521 x 464 x 425	705 x 521 x 464 x 425	32.0mm (Gasket OD)
20.0"	607 x 578 x 526 x 500	654 x 578 x 526 x 500	683 x 578 x 521 x 489	699 x 572 x 521 x 483	756 x 572 x 514 x 476	19.0mm (Gasket ID)
24.0"	718 x 686 x 629 x 603	775 x 686 x 629 x 603	791 x 686 x 629 x 591	838 x 679 x 629 x 591	902 x 679 x 616 x 578	14.0mm (Inner Ring ID)

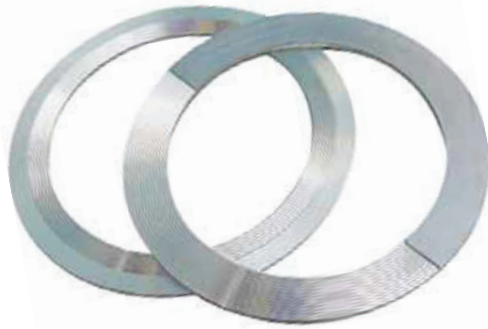
SPIRAL WOUND GASKET DIMENSIONAL DATA TO SUIT ANSI STANDARD FLANGES AS PER ASME B16.47 Series A				
NPS (Inches)	Class 150 (mm)	Class 300 (mm)	Class 600 (mm)	Class 900 (mm)
26.0"	775 x 705 x 673 x 654	835 x 737 x 686 x 654	867 x 737 x 686 x 648	883 x 737 x 686 x 660
28.0"	832 x 756 x 724 x 705	899 x 787 x 737 x 705	914 x 787 x 737 x 699	946 x 787 x 737 x 711
30.0"	883 x 806 x 775 x 756	953 x 845 x 794 x 756	972 x 845 x 794 x 756	1010 x 845 x 794 x 768
32.0"	940 x 861 x 826 x 806	1007 x 902 x 851 x 806	1022 x 902 x 851 x 813	1073 x 902 x 851 x 813
34.0"	991 x 911 x 876 x 857	1057 x 953 x 902 x 857	1073 x 953 x 902 x 864	1137 x 953 x 902 x 864
36.0"	1048 x 969 x 927 x 908	1118 x 1007 x 956 x 908	1130 x 1007 x 956 x 918	1200 x 1010 x 959 x 921
38.0"	1111 x 1019 x 978 x 959	1054 x 1016 x 978 x 953	1105 x 1041 x 991 x 953	1200 x 1086 x 1035 x 1010
40.0"	1162 x 1070 x 1029 x 1010	1115 x 1070 x 1022 x 1003	1156 x 1099 x 1048 x 1010	1251 x 1149 x 1099 x 1060
42.0"	1219 x 1124 x 1080 x 1060	1165 x 1121 x 1073 x 1054	1219 x 1156 x 1105 x 1067	1302 x 1200 x 1149 x 1111
44.0"	1276 x 1178 x 1130 x 1111	1219 x 1181 x 1130 x 1105	1270 x 1213 x 1162 x 1111	1369 x 1257 x 1207 x 1156
46.0"	1327 x 1229 x 1181 x 1162	1273 x 1229 x 1178 x 1153	1327 x 1264 x 1213 x 1162	1435 x 1321 x 1270 x 1219
48.0"	1384 x 1280 x 1232 x 1213	1324 x 1286 x 1235 x 1210	1391 x 1321 x 1270 x 1219	1486 x 1372 x 1321 x 1270
50.0"	1435 x 1334 x 1283 x 1264	1378 x 1346 x 1295 x 1245	1448 x 1372 x 1321 x 1270	eg. (26.0" Class 150#)
52.0"	1492 x 1384 x 1334 x 1314	1429 x 1403 x 1346 x 1321	1499 x 1422 x 1372 x 1321	775.0mm (Outer Ring OD)
54.0"	1549 x 1435 x 1384 x 1359	1492 x 1454 x 1397 x 1353	1556 x 1480 x 1429 x 1378	705.0mm (Gasket OD)
56.0"	1607 x 1486 x 1435 x 1410	1543 x 1505 x 1454 x 1403	1613 x 1530 x 1480 x 1429	673.0mm (Gasket ID)
58.0"	1664 x 1537 x 1486 x 1461	1594 x 1562 x 1511 x 1448	1664 x 1588 x 1537 x 1473	654.0mm (Inner Ring ID)
60.0"	1715 x 1588 x 1537 x 1511	1645 x 1613 x 1562 x 1524	1734 x 1645 x 1594 x 1530	

SPIRAL WOUND GASKET DIMENSIONAL DATA TO SUIT ANSI STANDARD FLANGES AS PER ASME B16.47 Series B				
NPS (Inches)	Class 150 (mm)	Class 300 (mm)	Class 600 (mm)	Class 900 (mm)
26.0"	725 x 699 x 673 x 654	772 x 711 x 673 x 654	765 x 715 x 664 x 645	838 x 749 x 705 x 667
28.0"	776 x 749 x 724 x 705	826 x 762 x 724 x 705	819 x 756 x 705 x 699	902 x 800 x 743 x 718
30.0"	827 x 800 x 775 x 756	886 x 813 x 775 x 756	880 x 829 x 778 x 753	959 x 857 x 806 x 781
32.0"	881 x 851 x 826 x 806	940 x 864 x 826 x 806	933 x 883 x 832 x 794	1016 x 914 x 864 x 838
34.0"	935 x 908 x 876 x 857	994 x 914 x 876 x 857	997 x 940 x 889 x 851	1073 x 971 x 921 x 895
36.0"	988 x 959 x 927 x 908	1048 x 965 x 927 x 908	1048 x 991 x 940 x 902	1124 x 997 x 946 x 921
38.0"	1045 x 1010 x 975 x 959	1099 x 1048 x 1010 x 972	1105 x 1041 x 991 x 953	1200 x 1086 x 1035 x 1010
40.0"	1096 x 1064 x 1022 x 1010	1149 x 1099 x 1060 x 1022	1156 x 1099 x 1048 x 1010	1251 x 1149 x 1099 x 1060
42.0"	1146 x 1115 x 1080 x 1060	1200 x 1149 x 1111 x 1086	1219 x 1156 x 1105 x 1067	1302 x 1200 x 1149 x 1111
44.0"	1197 x 1165 x 1124 x 1111	1251 x 1200 x 1162 x 1124	1270 x 1213 x 1162 x 1111	1369 x 1257 x 1207 x 1156
46.0"	1256 x 1224 x 1181 x 1162	1318 x 1254 x 1216 x 1178	1327 x 1264 x 1213 x 1162	1435 x 1321 x 1270 x 1219
48.0"	1307 x 1270 x 1232 x 1213	1369 x 1311 x 1264 x 1232	1391 x 1321 x 1270 x 1219	1486 x 1372 x 1321 x 1270
50.0"	1357 x 1326 x 1283 x 1264	1419 x 1356 x 1318 x 1267	1448 x 1372 x 1321 x 1270	eg. (26.0" Class 150#)
52.0"	1408 x 1376 x 1334 x 1314	1470 x 1407 x 1369 x 1318	1499 x 1422 x 1372 x 1321	725.0mm (Outer Ring OD)
54.0"	1464 x 1422 x 1384 x 1365	1530 x 1454 x 1403 x 1365	1556 x 1480 x 1429 x 1378	699.0mm (Gasket OD)
56.0"	1515 x 1478 x 1445 x 1422	1594 x 1524 x 1480 x 1429	1613 x 1530 x 1480 x 1429	673.0mm (Gasket ID)
58.0"	1580 x 1529 x 1500 x 1478	1656 x 1573 x 1535 x 1484	1664 x 1588 x 1537 x 1473	654.0mm (Inner Ring ID)
60.0"	1630 x 1586 x 1557 x 1535	1707 x 1630 x 1589 x 1557	1734 x 1645 x 1594 x 1530	



## SEMI METALLIC GASKET

### CAMPROFILE GASKETS



Camprofile gaskets consists of a metal core (Generally Stainless Steel) with concentric grooves on either side with sealing materials. The sealing layers can be Graphite, PTFE depends on application. Camprofile can be used without sealing layers to provide an excellent seal but there is a risk of flange surface damage

**Due to wide seating stress range of the camprofile gasket makes it :**

- ▶ Highly suitable for varying temperature and pressures.
- ▶ Less sensitive to assembly faults (inaccurate bolt tensioning).
- ▶ Suitable for light and heavily constructed flanges.
- ▶ Depending on layer material camprofile gaskets are resistant to temperatures up to 1000° C.
- ▶ Resistant to media pressures up to 250 Bar.

#### Benefits;

- ▶ When assembled the layer thickness of the sealing material is extremely small (0.5mm) thus reducing leaks, reject rates and environment pollution.
- ▶ The gasket will not damage the flange surface and can be easily removed.
- ▶ Reduces maintenance costs.
- ▶ Emergency sealing of damaged flanges by using 1mm thick sealing layers until the flange can be reworked.
- ▶ Excellent performance on fluctuating temperatures and pressures.
- ▶ Direct replacement for existing gaskets. No special flange finish is necessary.
- ▶ Eco friendly.

### Camprofile Gasket for Flange joints



Without Ring



With Integral Ring



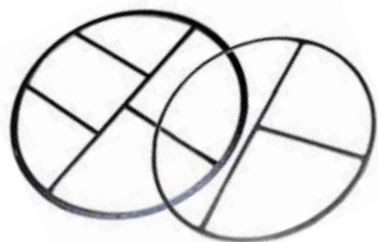
With Split Ring

#### Recommended seating stress range for reliable and effective performance

Material	Temp. Deg. °C		Max. Operating Pressure (Bar)	Gas Tightness	Application	Seating Stress		
	Min.	Max.				Min (N/mm <sup>2</sup> )	Optimum (N/mm <sup>2</sup> )	Max (N/mm <sup>2</sup> )
Graphite	-200	+550	250	Good	Aggressive Media	20	90	400
PTFE	-200	+250	100	Good	Aggressive Media	20	90	400
Silver	-200	+750	250	Good	Aggressive Media	125	240	450

## SEMI METALLIC GASKET

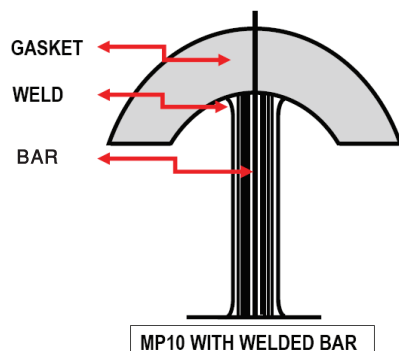
### HEAT EXCHANGER GASKET



Heat Exchanger Gasket is a term that has been given to gasket used in heat exchangers. The structure of the gasket or its type varies according to the operating conditions of the exchangers. The heat exchanger gaskets come in a broad specter of types including single or double jacketed, corrugated, plain metal, soft and many other. A large selection of different materials allows heat exchangers to operate at temperatures beyond the capabilities of most soft gasket materials.

#### Advantages:

- ▶ Available in wide range of materials, since they are all custom made
- ▶ Metal jacketed heat exchangers
- ▶ The Metal jacket provides mechanic strength to contain the filler and improves chemical resistance
- ▶ Unique construction provides stability and ensures trouble-free handling and installation



Gaskets with welded bars have eliminated greatest problems of conventional gaskets, which develop cracks in the radius. Metal or alloys are commercially available in sheets or rolls of 1000 mm width.

The primary and secondary seals are continuous all around the gasket. The gasket has an excellent sealability, reducing leaks to the environment. The bars which seal between the heat exchanger passages are plasma or TIG welded with spot welds at each end. These welds are soft and small to avoid areas of increased resistance to seating.

MATERIALS FOR METALLIC JACKET		
Material	ASTM	DIN Material No.
Low Carbon Steel	Soft Iron	1.1003
Stainless Steel	AISI 304	1.4301
Stainless Steel	AISI 316	1.4401
Stainless Steel	AISI 321	1.4541
Stainless Steel	AISI 316 Ti	1.4571
Monel (NiCu30Fe)	B172, alloy 400	2.4360
Copper	Copper	2.0090
Brass	Brass Ms 63	2.0321
Aluminium	Aluminium 99.5	3.0255
Tatanium	B348 Gr. 1	3.7025

Filler: Flexible Graphite, Ceramic, calandered sealing materials.

Sizes: Gasket Thick – 3.2mm

Gasket Width – 10, 13 and 16mm

Bar Width – 8, 10 and 13.0mm.

#### GASKET ORDERING EXAMPLE

Gasket style (Refer to TYPE 1 to 25), Shape drawing

Dimensions: OD (Outer Dia.), ID (Inner Dia.),

Materials : Metel or Metal Filler

Gasket thickness

Bar Width

Radius and distance between bars or center line of bars

	TYPE 1		TYPE 10		TYPE 19
	TYPE 2		TYPE 11		TYPE 20
	TYPE 3		TYPE 12		TYPE 21
	TYPE 4		TYPE 13		TYPE 22
	TYPE 5		TYPE 14		TYPE 23
	TYPE 6		TYPE 15		TYPE 24
	TYPE 7		TYPE 16		TYPE 25
	TYPE 8		TYPE 17		
	TYPE 9		TYPE 18		

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