SAE INTERNATIONAL

AEROSPACE STANDARD

AS5781™ REV. C

Issued 2007-07
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Revised 2021-12

Superseding AS5781B

Retainers (Backup Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Single Turn, Scarf-Cut, For Use in AS4716 Glands

RATIONALE

This limited scope revision corrects the diameter to be measured for the following part numbers: AS5781P(XX)-210 through AS5781P(XX)-221.

1. SCOPE

This SAE Aerospace Standard (AS) specifies scarf-cut polytetrafluoroethylene (PTFE) retainers (backup rings) for use in glands in accordance with AS4716. They are usually used in hydraulic and pneumatic system components as anti-extrusion devices in conjunction with O-rings and other seals for static and dynamic applications.

NOTE: This specification includes material tests but does not include hydraulic or pneumatic performance tests.

1.1 Field of Application

Backup rings to the dimensions in AS5781 are for use in glands to AS4716 only. They shall not be used in glands to MIL-G-5514 or AS5857, please refer to the Note below.

NOTE: Parts standard AS8791 (scarf-cut backup rings) for use in glands to MIL-G-5514 and parts standard AS5860 (scarf-cut backup rings) for use in AS5857 glands have been published.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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For more information on this standard, visit
https://www.sae.org/standards/content/AS5781C/

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS3678 Polytetrafluoroethylene (PTFE) Moldings and Extrusions Unfilled, Pigmented, and Filled Components

AMS3678/1 Type 1 - Virgin Polytetrafluoroethylene (PTFE) Moldings and Extrusions

AMS3678/2 Type 2 - 15% Graphite Filled Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions

AMS3678/3 Type 3 - 15% Glass, 5% Molybdenum Disulfide Filled Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions

AMS3678/4 Type 4 - 25% Glass Filled Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions

AMS3678/5 Type 5 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with Pigment

AMS3678/6 Type 6 - 60% Bronze Filled Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions

AMS3678/7 Type 7 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with 25% Carbon and Graphite

AMS3678/8 Type 8 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with 10% Carbon Fiber

AMS3678/9 Type 9 - Virgin Polytetrafluoroethylene (PTFE) Moldings with Pigment for AS4716 and AS5857 Backup Rings

AMS3678/10 Type 10 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with 15% Carbon Fiber

AS4716 Gland Design, O-ring and Other Seals

AS5857 Gland Design, O-ring and Other Elastomeric Seals, Static Applications

AS5860 Retainers, (Back-Up Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Single Turn, Static Glands to AS5857

AS5861 Retainers, (Back-Up Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Solid, Static Gland

AS8791 Hydraulic and Pneumatic Retainers (Back-Up Rings), Polytetrafluoroethylene (PTFE) Resin

2.1.2 U.S. Government Publications

Copies of these documents are available online at https://quicksearch.dla.mil.

MIL-G-5514 Gland Design; Packing, Hydraulic, General Requirements For (Inactive for New Design)

MIL-STD-2073-1 Standard Practice for Military Packaging

2.1.3 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ASME Y14.5-2009 Dimensioning and Tolerancing

3. TECHNICAL REQUIREMENTS

3.1 Design

Backup rings specified herein have been designed for a temperature range of -65 to 275 °F (-54 to 135 °C) and a nominal operating pressure of 3000 psi (20684 kPa) for code 09 material (AMS3678/9). Alternate materials to AMS3678 are offered for more arduous operating conditions.

Because of the construction of groove dimensions, backup rings specific to piston applications are designated “P” - Piston (Male). Backup rings specific to rod applications are designated “R” - Rod (Female).

3.2 Cylinder Breathing, Material Contraction and Expansion

Consideration has been made to accommodate cylinder breathing on piston applications, calculated at 0.002 inch/inch diameter/1000 psi (0.05 mm/mm diameter/6895 kPa) (in accordance with AS4716) along with PTFE contraction to ensure a minimum 50% lap at the scarf-cut at -65 °F (-54 °C). This has required an increase in the diameter on certain larger sizes and a slight overlap at ambient will, therefore, be apparent. These parts have been designed such that the overlap at 275 °F (135 °C) will not result in axial compression of the O-rings local to the scarf-cut, even in the worst tolerance stack-up situation.

When thermal cycling is experienced under even moderate pressures, some circumferential shrinking may occur leading to the scarf cut gap increasing which could result in O-ring failure. Performance testing under these conditions is recommended.

3.3 Materials and Applications

3.3.1 Primary Material

Code 09, Virgin PTFE with pigment: Parts shall be made from material code 09 of this standard and shall conform to AMS3678/9 as follows:

- Parts made to material code 09 of this standard for “P” (Piston) applications shall be yellow per AMS3678/9.
- Parts made to material code 09 of this standard for “R” (Rod) applications shall be blue per AMS3678/9.

NOTE: Brown pigmented material to AMS3678/9 is for use for “P” (Piston) backup rings to AS5860 and AS5861. Green pigmented material to AMS3678/9 is for use for “R” (Rod) backup rings to AS5860 and AS5861.

Details of material specification, material code, color, composition, application and pressures for code 09 material applicable to this document are listed in Table 1. Other data listed in Table 1 is for alternate materials or for reference only.

3.3.2 Application of Alternate Materials

Alternate materials to AMS3678 offer improved physical properties for more arduous operating conditions.

The alternate materials listed in Table 1 (except AMS3678/1 and AMS3678/4) can also be ordered by using the part identification numbers of this standard, see 3.5.

NOTE: When alternate materials are selected it is recommended that adequate performance for the application be verified by operational testing.

Table 1 - Materials and applications

Material	Material Code[6]	Color	Composition	Application	Max Pressure[5] psi	kPa
AMS3678/1	N/A	White	Virgin PTFE[1]	Not to be used	N/A	
AMS3678/2	02	Black	15% Graphite	Static & Dynamic	3000	20684
AMS3678/3	03	Gray	15% Glass, 5% M_0S_2	Static	4000	27579
AMS3678/4	N/A	White	25% Glass[2]	Not to be used	N/A	
AMS3678/5	05	Per Supplier	Virgin, Pigmented[3]	Static & Dynamic	2000	13790
AMS3678/6	06	Brown	60% Bronze[4]	Static	5000	34474
AMS3678/7	07	Black	25% Carbon/Graphite	Static	5000	34474
AMS3678/8	08	Black	10% Carbon Fiber	Static & Dynamic	4000	27579
AMS3678/9	09	See 3.3.1	Virgin, Pigmented	Static & Dynamic	3000	20684
AMS3678/10	10	Black	15% Carbon Fiber	Static & Dynamic	5000	34474

NOTES:

1 Material to AMS3678/1 Grade A and Grade B is not to be used because both have lower physical properties and, therefore, lower performance than AMS3678/9.

2 Glass fibers can be abrasive, particularly in dynamic applications and against soft surfaces such as aluminum and some grades of titanium and stainless steels.

3 Usually used for manufacturer's proprietary pigment colors.

4 Not usually recommended for hydraulic systems as bronze particles can clog filters.

5 Maximum pressures indicated are for guidance purposes only and for pressures above 3000 psi (20684 kPa) testing is recommended.

6 Material Designation Codes are derived from the appropriate slash sheets of AMS3678.

3.3.3 Color Identification for Materials Other Than Code 09

Color pigmentation for material to AMS3678/5 is usually proprietary per manufacturer but shall not be blue, yellow, brown, or green in order to avoid confusion with material per AMS3678/9.

There is no color pigmentation applied to materials to AMS3678/1, AMS3678/2, AMS3678/3, AMS3678/4, AMS3678/6, AMS3678/7, AMS3678/8, and AMS3678/10.

3.4 Dimensional Requirements

See Figure 1.

See Tables 2A, 2B, 2C, and 2D for dimensions.

Dimensions and Tolerancing per ASME Y14.5-2009.

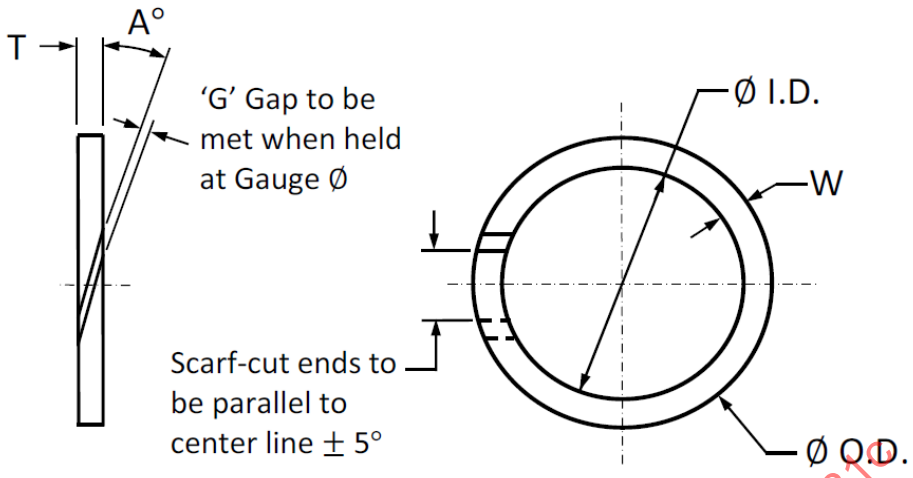

Figure 1 - Backup ring controlled features

3.5 Part Number

The part number consists of the standard number, the piston (P) or rod (R) code, the material code followed by the appropriate three-digit dash number taken from Tables 2A, 2B, 2C, and 2D as shown in Figure 2 below.

Example Part Number:

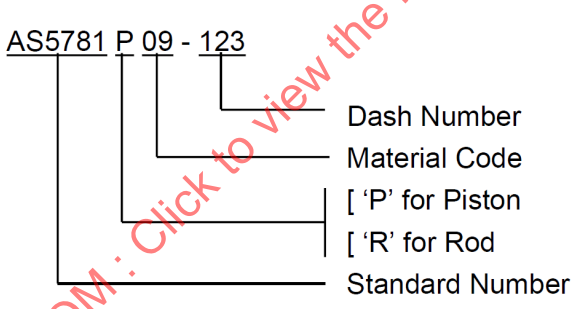

Figure 2 - Example part number

NOTES:

1. In the above example Part Number, "P" for Piston, Code 09 material, and dash 123 size are all used for example purposes only.

2. Spaces between characters in the above example Part Number are for illustration and clarity only and are not used in the Part Number.

Table 2A - Piston (male) applications - backup ring dimensions in inches and degrees

See Figures 1 and 2.

NOTE: The diameters, ID or OD in Tables 2A, 2B, 2C, and 2D refer to the ID or OD of the backup rings. The diameters listed are the gauge diameters by which backup rings are measured.

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.0025	A Degrees
AS5781P(XX)-004	0.075	0.050	0.056	0.0025	39-35
AS5781P(XX)-005	0.114	0.050	0.052	0.0025	36-32
AS5781P(XX)-006	0.128	0.050	0.052	0.0025	33-29
AS5781P(XX)-007	0.157	0.050	0.053	0.0025	27-24
AS5781P(XX)-008	0.189	0.050	0.053	0.0025	22-19
AS5781P(XX)-009	0.220	0.050	0.053	0.0025	22-19
AS5781P(XX)-010	0.250	0.050	0.054	0.0025	22-19
AS5781P(XX)-011	0.312	0.050	0.054	0.0025	22-19
AS5781P(XX)-012	0.375	0.050	0.054	0.0025	22-19
AS5781P(XX)-013	0.441	0.050	0.053	0.0025	22-19
AS5781P(XX)-014	0.504	0.050	0.053	0.0025	22-19
AS5781P(XX)-015	0.566	0.050	0.053	0.0025	22-19
AS5781P(XX)-016	0.629	0.050	0.053	0.0025	22-19
AS5781P(XX)-017	0.691	0.050	0.053	0.0025	22-19
AS5781P(XX)-018	0.753	0.050	0.054	0.0025	22-19
AS5781P(XX)-019	0.815	0.050	0.054	0.0025	22-19
AS5781P(XX)-020	0.881	0.050	0.054	0.0025	22-19
AS5781P(XX)-021	0.943	0.050	0.054	0.0025	22-19
AS5781P(XX)-022	1.007	0.050	0.054	0.0025	22-19
AS5781P(XX)-023	1.069	0.050	0.054	0.0025	22-19
AS5781P(XX)-024	1.133	0.050	0.054	0.0025	22-19
AS5781P(XX)-025	1.196	0.050	0.054	0.0025	22-19
AS5781P(XX)-026	1.260	0.050	0.054	0.0025	22-19
AS5781P(XX)-027	1.323	0.050	0.054	0.0025	22-19
AS5781P(XX)-028	1.386	0.050	0.054	0.0025	22-19

Table 2A - Piston (male) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.003	A Degrees
AS5781P(XX)-104	0.128	0.058	0.084	0.003	35-31
AS5781P(XX)-105	0.158	0.058	0.084	0.003	29-26
AS5781P(XX)-106	0.187	0.058	0.085	0.003	26-23
AS5781P(XX)-107	0.215	0.058	0.087	0.003	22-19
AS5781P(XX)-108	0.246	0.058	0.087	0.003	22-19
AS5781P(XX)-109	0.308	0.058	0.087	0.003	22-19
AS5781P(XX)-110	0.379	0.058	0.084	0.003	22-19
AS5781P(XX)-111	0.441	0.058	0.085	0.003	22-19
AS5781P(XX)-112	0.502	0.058	0.085	0.003	22-19
AS5781P(XX)-113	0.565	0.058	0.085	0.003	22-19
AS5781P(XX)-114	0.627	0.058	0.085	0.003	22-19
AS5781P(XX)-115	0.689	0.058	0.086	0.003	22-19
AS5781P(XX)-116	0.751	0.058	0.086	0.003	22-19
AS5781P(XX)-117	0.817	0.058	0.086	0.003	22-19
AS5781P(XX)-118	0.879	0.058	0.086	0.003	22-19
AS5781P(XX)-119	0.942	0.058	0.086	0.003	22-19
AS5781P(XX)-120	1.003	0.058	0.086	0.003	22-19
AS5781P(XX)-121	1.066	0.058	0.086	0.003	22-19
AS5781P(XX)-122	1.129	0.058	0.086	0.003	22-19
AS5781P(XX)-123	1.192	0.058	0.086	0.003	22-19
AS5781P(XX)-124	1.255	0.058	0.086	0.003	22-19
AS5781P(XX)-125	1.319	.058	0.086	0.003	22-19
AS5781P(XX)-126	1.382	.058	0.086	0.003	22-19
AS5781P(XX)-127	1.445	.058	0.086	0.003	22-19
	Gauge OD ±0.001				
AS5781P(XX)-128	1.678	0.058	0.086	0.003	15-12
AS5781P(XX)-129	1.741	0.058	0.086	0.003	15-12
AS5781P(XX)-130	1.805	0.058	0.086	0.003	15-12
AS5781P(XX)-131	1.867	0.058	0.086	0.003	15-12
AS5781P(XX)-132	1.930	0.058	0.086	0.003	15-12
AS5781P(XX)-133	1.992	0.058	0.086	0.003	15-12
AS5781P(XX)-134	2.055	0.058	0.086	0.003	15-12
AS5781P(XX)-135	2.118	0.058	0.086	0.003	15-12
AS5781P(XX)-136	2.180	0.058	0.086	0.003	15-12
AS5781P(XX)-137	2.243	0.058	0.086	0.003	15-12
AS5781P(XX)-138	2.305	0.058	0.086	0.003	15-12
AS5781P(XX)-139	2.368	0.058	0.086	0.003	15-12

Table 2A - Piston (male) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.003	A Degrees
AS5781P(XX)-210	0.750	0.062	0.119	0.003	22-19
AS5781P(XX)-211	0.812	0.062	0.119	0.003	22-19
AS5781P(XX)-212	0.874	0.062	0.119	0.003	22-19
AS5781P(XX)-213	0.937	0.062	0.119	0.003	22-19
AS5781P(XX)-214	0.999	0.062	0.119	0.003	22-19
AS5781P(XX)-215	1.061	0.062	0.119	0.003	22-19
AS5781P(XX)-216	1.124	0.062	0.119	0.003	22-19
AS5781P(XX)-217	1.186	0.062	0.119	0.003	22-19
AS5781P(XX)-218	1.250	0.062	0.119	0.003	22-19
AS5781P(XX)-219	1.313	0.062	0.119	0.003	22-19
AS5781P(XX)-220	1.377	0.062	0.119	0.003	22-19
AS5781P(XX)-221	1.439	0.062	0.119	0.003	22-19
	Gauge OD ±0.001				
AS5781P(XX)-222	1.741	0.062	0.119	0.003	22-19
AS5781P(XX)-223	1.867	0.062	0.119	0.003	15-12
AS5781P(XX)-224	1.992	0.062	0.119	0.003	15-12
AS5781P(XX)-225	2.118	0.062	0.119	0.003	15-12
AS5781P(XX)-226	2.243	0.062	0.119	0.003	15-12
AS5781P(XX)-227	2.368	0.062	0.119	0.003	15-12
AS5781P(XX)-228	2.493	0.062	0.119	0.003	15-12
AS5781P(XX)-229	2.618	0.062	0.119	0.003	15-12
AS5781P(XX)-230	2.743	0.062	0.119	0.003	15-12

Table 2A - Piston (male) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge OD ±0.001	T ±0.002	W ±0.001	G ±0.0035	A Degrees
AS5781P(XX)-325	1.867	0.088	0.185	0.0035	22-19
AS5781P(XX)-326	1.992	0.088	0.185	0.0035	22-19
AS5781P(XX)-327	2.118	0.088	0.185	0.0035	22-19
AS5781P(XX)-328	2.243	0.088	0.185	0.0035	22-19
AS5781P(XX)-329	2.368	0.088	0.185	0.0035	22-19
AS5781P(XX)-330	2.494	0.088	0.185	0.0035	22-19
AS5781P(XX)-331	2.620	0.088	0.185	0.0035	22-19
AS5781P(XX)-332	2.747	0.088	0.185	0.0035	22-19
AS5781P(XX)-333	2.873	0.088	0.185	0.0035	22-19
AS5781P(XX)-334	2.993	0.088	0.185	0.0035	15-12
AS5781P(XX)-335	3.118	0.088	0.185	0.0035	15-12
AS5781P(XX)-336	3.243	0.088	0.185	0.0035	15-12
AS5781P(XX)-337	3.368	0.088	0.185	0.0035	15-12
AS5781P(XX)-338	3.493	0.088	0.185	0.0035	15-12
AS5781P(XX)-339	3.618	0.088	0.185	0.0035	15-12
AS5781P(XX)-340	3.743	0.088	0.185	0.0035	15-12
AS5781P(XX)-341	3.868	0.088	0.185	0.0035	15-12
AS5781P(XX)-342	3.994	0.088	0.185	0.0035	15-12
AS5781P(XX)-343	4.120	0.088	0.185	0.0035	15-12
AS5781P(XX)-344	4.247	0.088	0.185	0.0035	15-12
AS5781P(XX)-345	4.373	0.088	0.185	0.0035	15-12
AS5781P(XX)-346	4.500	0.088	0.185	0.0035	15-12
AS5781P(XX)-347	4.626	0.088	0.185	0.0035	15-12
AS5781P(XX)-348	4.753	0.088	0.185	0.0035	15-12
AS5781P(XX)-349	4.879	0.088	0.185	0.0035	15-12

Table 2A - Piston (male) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge OD ±0.001	T ±0.002	W ±0.001	G ±0.004	A Degrees
AS5781P(XX)-425	4.974	0.129	0.237	0.004	15-12
AS5781P(XX)-426	5.099	0.129	0.237	0.004	15-12
AS5781P(XX)-427	5.224	0.129	0.237	0.004	15-12
AS5781P(XX)-428	5.349	0.129	0.237	0.004	15-12
AS5781P(XX)-429	5.474	0.129	0.237	0.004	15-12
AS5781P(XX)-430	5.599	0.129	0.237	0.004	15-12
AS5781P(XX)-431	5.725	0.129	0.237	0.004	15-12
AS5781P(XX)-432	5.851	0.129	0.237	0.004	15-12
AS5781P(XX)-433	5.978	0.129	0.237	0.004	15-12
AS5781P(XX)-434	6.104	0.129	0.237	0.004	15-12
AS5781P(XX)-435	6.231	0.129	0.237	0.004	15-12
AS5781P(XX)-436	6.357	0.129	0.237	0.004	15-12
AS5781P(XX)-437	6.484	0.129	0.237	0.004	15-12

Table 2B - Rod (female) applications - backup ring dimensions in inches and degrees

See Figures 1 and 2.

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.0025	A Degrees
AS5781R(XX)-004	0.076	0.050	0.057	0.0025	39-35
AS5781R(XX)-005	0.108	0.050	0.054	0.0025	36-32
AS5781R(XX)-006	0.123	0.050	0.055	0.0025	33-29
AS5781R(XX)-007	0.154	0.050	0.055	0.0025	27-24
AS5781R(XX)-008	0.185	0.050	0.054	0.0025	22-19
AS5781R(XX)-009	0.217	0.050	0.055	0.0025	22-19
AS5781R(XX)-010	0.248	0.050	0.055	0.0025	22-19
AS5781R(XX)-011	0.310	0.050	0.055	0.0025	22-19
AS5781R(XX)-012	0.373	0.050	0.055	0.0025	22-19
AS5781R(XX)-013	0.435	0.050	0.055	0.0025	22-19
AS5781R(XX)-014	0.498	0.050	0.055	0.0025	22-19
AS5781R(XX)-015	0.560	0.050	0.055	0.0025	22-19
AS5781R(XX)-016	0.623	0.050	0.055	0.0025	22-19
AS5781R(XX)-017	0.685	0.050	0.055	0.0025	22-19
AS5781R(XX)-018	0.748	0.050	0.055	0.0025	22-19
AS5781R(XX)-019	0.810	0.050	0.055	0.0025	22-19
AS5781R(XX)-020	0.873	0.050	0.055	0.0025	22-19
AS5781R(XX)-021	0.935	0.050	0.055	0.0025	22-19
AS5781R(XX)-022	0.998	0.050	0.055	0.0025	22-19
AS5781R(XX)-023	1.060	0.050	0.055	0.0025	22-19
AS5781R(XX)-024	1.123	0.050	0.055	0.0025	22-19
AS5781R(XX)-025	1.185	0.050	0.055	0.0025	22-19
AS5781R(XX)-026	1.248	0.050	0.055	0.0025	22-19
AS5781R(XX)-027	1.311	0.050	0.055	0.0025	22-19
AS5781R(XX)-028	1.374	0.050	0.055	0.0025	22-19

Table 2B - Rod (female) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.003	A Degrees
AS5781R(XX)-104	0.123	0.058	0.085	0.003	35-31
AS5781R(XX)-105	0.154	0.058	0.085	0.003	29-26
AS5781R(XX)-106	0.185	0.058	0.086	0.003	26-23
AS5781R(XX)-107	0.217	0.058	0.086	0.003	22-19
AS5781R(XX)-108	0.248	0.058	0.086	0.003	22-19
AS5781R(XX)-109	0.310	0.058	0.087	0.003	22-19
AS5781R(XX)-110	0.373	0.058	0.085	0.003	22-19
AS5781R(XX)-111	0.435	0.058	0.086	0.003	22-19
AS5781R(XX)-112	0.498	0.058	0.086	0.003	22-19
AS5781R(XX)-113	0.560	0.058	0.086	0.003	22-19
AS5781R(XX)-114	0.623	0.058	0.086	0.003	22-19
AS5781R(XX)-115	0.685	0.058	0.086	0.003	22-19
AS5781R(XX)-116	0.748	0.058	0.086	0.003	22-19
AS5781R(XX)-117	0.810	0.058	0.086	0.003	22-19
AS5781R(XX)-118	0.873	0.058	0.086	0.003	22-19
AS5781R(XX)-119	0.935	0.058	0.086	0.003	22-19
AS5781R(XX)-120	0.998	0.058	0.086	0.003	22-19
AS5781R(XX)-121	1.060	0.058	0.086	0.003	22-19
AS5781R(XX)-122	1.123	0.058	0.086	0.003	22-19
AS5781R(XX)-123	1.185	0.058	0.086	0.003	22-19
AS5781R(XX)-124	1.248	0.058	0.086	0.003	22-19
AS5781R(XX)-125	1.311	0.058	0.086	0.003	22-19
AS5781R(XX)-126	1.374	0.058	0.086	0.003	22-19
AS5781R(XX)-127	1.437	0.058	0.086	0.003	22-19
AS5781R(XX)-128	1.501	0.058	0.086	0.003	22-19
AS5781R(XX)-129	1.563	0.058	0.086	0.003	22-19
AS5781R(XX)-130	1.627	0.058	0.086	0.003	22-19
AS5781R(XX)-131	1.689	0.058	0.086	0.003	22-19
AS5781R(XX)-132	1.753	0.058	0.086	0.003	22-19
AS5781R(XX)-133	1.816	0.058	0.086	0.003	22-19
AS5781R(XX)-134	1.879	0.058	0.086	0.003	22-19
AS5781R(XX)-135	1.943	0.058	0.086	0.003	22-19
AS5781R(XX)-136	2.005	0.058	0.086	0.003	22-19
AS5781R(XX)-137	2.069	0.058	0.086	0.003	22-19
AS5781R(XX)-138	2.123	0.058	0.086	0.003	15-12
AS5781R(XX)-139	2.186	0.058	0.086	0.003	15-12

Table 2B - Rod (female) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.003	A Degrees
AS5781R(XX)-210	0.748	0.062	0.120	0.003	22-19
AS5781R(XX)-211	0.810	0.062	0.120	0.003	22-19
AS5781R(XX)-212	0.873	0.062	0.120	0.003	22-19
AS5781R(XX)-213	0.935	0.062	0.120	0.003	22-19
AS5781R(XX)-214	0.998	0.062	0.120	0.003	22-19
AS5781R(XX)-215	1.060	0.062	0.120	0.003	22-19
AS5781R(XX)-216	1.123	0.062	0.120	0.003	22-19
AS5781R(XX)-217	1.185	0.062	0.120	0.003	22-19
AS5781R(XX)-218	1.248	0.062	0.120	0.003	22-19
AS5781R(XX)-219	1.310	0.062	0.120	0.003	22-19
AS5781R(XX)-220	1.373	0.062	0.120	0.003	22-19
AS5781R(XX)-221	1.435	0.062	0.120	0.003	22-19
AS5781R(XX)-222	1.499	0.062	0.120	0.003	22-19
AS5781R(XX)-223	1.623	0.062	0.120	0.003	15-12
AS5781R(XX)-224	1.748	0.062	0.120	0.003	15-12
AS5781R(XX)-225	1.873	0.062	0.120	0.003	15-12
AS5781R(XX)-226	1.998	0.062	0.120	0.003	15-12
AS5781R(XX)-227	2.123	0.062	0.120	0.003	15-12
AS5781R(XX)-228	2.248	0.062	0.120	0.003	15-12
AS5781R(XX)-229	2.373	0.062	0.120	0.003	15-12
AS5781R(XX)-230	2.498	0.062	0.120	0.003	15-12

Table 2B - Rod (female) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.0035	A Degrees
AS5781R(XX)-325	1.498	0.088	0.185	0.0035	22-19
AS5781R(XX)-326	1.623	0.088	0.185	0.0035	22-19
AS5781R(XX)-327	1.748	0.088	0.185	0.0035	22-19
AS5781R(XX)-328	1.873	0.088	0.185	0.0035	22-19
AS5781R(XX)-329	1.998	0.088	0.185	0.0035	22-19
AS5781R(XX)-330	2.123	0.088	0.185	0.0035	22-19
AS5781R(XX)-331	2.248	0.088	0.185	0.0035	22-19
AS5781R(XX)-332	2.373	0.088	0.185	0.0035	22-19
AS5781R(XX)-333	2.498	0.088	0.185	0.0035	22-19
AS5781R(XX)-334	2.623	0.088	0.185	0.0035	22-19
AS5781R(XX)-335	2.748	0.088	0.185	0.0035	15-12
AS5781R(XX)-336	2.873	0.088	0.185	0.0035	15-12
AS5781R(XX)-337	2.997	0.088	0.185	0.0035	15-12
AS5781R(XX)-338	3.122	0.088	0.185	0.0035	15-12
AS5781R(XX)-339	3.247	0.088	0.185	0.0035	15-12
AS5781R(XX)-340	3.372	0.088	0.185	0.0035	15-12
AS5781R(XX)-341	3.497	0.088	0.185	0.0035	15-12
AS5781R(XX)-342	3.622	0.088	0.185	0.0035	15-12
AS5781R(XX)-343	3.747	0.088	0.185	0.0035	15-12
AS5781R(XX)-344	3.872	0.088	0.185	0.0035	15-12
AS5781R(XX)-345	3.997	0.088	0.185	0.0035	15-12
AS5781R(XX)-346	4.122	0.088	0.185	0.0035	15-12
AS5781R(XX)-347	4.247	0.088	0.185	0.0035	15-12
AS5781R(XX)-348	4.372	0.088	0.185	0.0035	15-12
AS5781R(XX)-349	4.497	0.088	0.185	0.0035	15-12

Table 2B - Rod (female) applications - backup ring dimensions in inches and degrees (continued)

Part No.	Gauge ID ±0.001	T ±0.002	W ±0.001	G ±0.004	A Degrees
AS5781R(XX)-425	4.497	0.129	0.237	0.004	15-12
AS5781R(XX)-426	4.622	0.129	0.237	0.004	15-12
AS5781R(XX)-427	4.747	0.129	0.237	0.004	15-12
AS5781R(XX)-428	4.872	0.129	0.237	0.004	15-12
AS5781R(XX)-429	4.997	0.129	0.237	0.004	15-12
AS5781R(XX)-430	5.122	0.129	0.237	0.004	15-12
AS5781R(XX)-431	5.247	0.129	0.237	0.004	15-12
AS5781R(XX)-432	5.372	0.129	0.237	0.004	15-12
AS5781R(XX)-433	5.497	0.129	0.237	0.004	15-12
AS5781R(XX)-434	5.622	0.129	0.237	0.004	15-12
AS5781R(XX)-435	5.747	0.129	0.237	0.004	15-12
AS5781R(XX)-436	5.872	0.129	0.237	0.004	15-12
AS5781R(XX)-437	5.997	0.129	0.237	0.004	15-12

Table 2C - Piston (male) applications - backup ring dimensions in millimeters and degrees

See Figures 1 and 2.

Part No.	Gauge ID ±0.03	T ±0.05	W ±0.03	G ±0.06	A Degrees
AS5781P(XX)-004	1.91	1.27	1.42	0.06	39-35
AS5781P(XX)-005	2.90	1.27	1.32	0.06	36-32
AS5781P(XX)-006	3.25	1.27	1.32	0.06	33-29
AS5781P(XX)-007	3.99	1.27	1.35	0.06	27-24
AS5781P(XX)-008	4.80	1.27	1.35	0.06	22-19
AS5781P(XX)-009	5.59	1.27	1.35	0.06	22-19
AS5781P(XX)-010	6.35	1.27	1.37	0.06	22-19
AS5781P(XX)-011	7.93	1.27	1.37	0.06	22-19
AS5781P(XX)-012	9.53	1.27	1.37	0.06	22-19
AS5781P(XX)-013	11.20	1.27	1.35	0.06	22-19
AS5781P(XX)-014	12.80	1.27	1.35	0.06	22-19
AS5781P(XX)-015	14.38	1.27	1.35	0.06	22-19
AS5781P(XX)-016	15.98	1.27	1.35	0.06	22-19
AS5781P(XX)-017	17.55	1.27	1.35	0.06	22-19
AS5781P(XX)-018	19.13	1.27	1.37	0.06	22-19
AS5781P(XX)-019	20.70	1.27	1.37	0.06	22-19
AS5781P(XX)-020	22.38	1.27	1.37	0.06	22-19
AS5781P(XX)-021	23.95	1.27	1.37	0.06	22-19
AS5781P(XX)-022	25.58	1.27	1.37	0.06	22-19
AS5781P(XX)-023	27.15	1.27	1.37	0.06	22-19
AS5781P(XX)-024	28.78	1.27	1.37	0.06	22-19
AS5781P(XX)-025	30.38	1.27	1.37	0.06	22-19
AS5781P(XX)-026	32.00	1.27	1.37	0.06	22-19
AS5781P(XX)-027	33.60	1.27	1.37	0.06	22-19
AS5781P(XX)-028	35.20	1.27	1.37	0.06	22-19

Table 2C - Piston (male) applications - backup ring dimensions in millimeters and degrees (continued)

Part No.	Gauge ID ±0.03	T ±0.05	W ±0.03	G ±0.08	A Degrees
AS5781P(XX)-104	3.25	1.47	2.13	0.08	35-31
AS5781P(XX)-105	4.01	1.47	2.13	0.08	29-26
AS5781P(XX)-106	4.75	1.47	2.16	0.08	26-23
AS5781P(XX)-107	5.46	1.47	2.21	0.08	22-19
AS5781P(XX)-108	6.25	1.47	2.21	0.08	22-19
AS5781P(XX)-109	7.82	1.47	2.21	0.08	22-19
AS5781P(XX)-110	9.63	1.47	2.13	0.08	22-19
AS5781P(XX)-111	11.20	1.47	2.16	0.08	22-19
AS5781P(XX)-112	12.75	1.47	2.16	0.08	22-19
AS5781P(XX)-113	14.35	1.47	2.16	0.08	22-19
AS5781P(XX)-114	15.93	1.47	2.16	0.08	22-19
AS5781P(XX)-115	17.50	1.47	2.18	0.08	22-19
AS5781P(XX)-116	19.08	1.47	2.18	0.08	22-19
AS5781P(XX)-117	20.75	1.47	2.18	0.08	22-19
AS5781P(XX)-118	22.33	1.47	2.18	0.08	22-19
AS5781P(XX)-119	23.93	1.47	2.18	0.08	22-19
AS5781P(XX)-120	25.48	1.47	2.18	0.08	22-19
AS5781P(XX)-121	27.08	1.47	2.18	0.08	22-19
AS5781P(XX)-122	28.68	1.47	2.18	0.08	22-19
AS5781P(XX)-123	30.28	1.47	2.18	0.08	22-19
AS5781P(XX)-124	31.88	1.47	2.184	0.08	22-19
AS5781P(XX)-125	33.50	1.47	2.184	0.08	22-19
AS5781P(XX)-126	35.10	1.47	2.184	0.08	22-19
AS5781P(XX)-127	36.70	1.47	2.184	0.08	22-19
	Gauge OD ±0.03				
AS5781P(XX)-128	42.62	1.47	2.18	0.08	15-12
AS5781P(XX)-129	44.22	1.47	2.18	0.08	15-12
AS5781P(XX)-130	45.85	1.47	2.18	0.08	15-12
AS5781P(XX)-131	47.42	1.47	2.18	0.08	15-12
AS5781P(XX)-132	49.02	1.47	2.18	0.08	15-12
AS5781P(XX)-133	50.60	1.47	2.18	0.08	15-12
AS5781P(XX)-134	52.20	1.47	2.18	0.08	15-12
AS5781P(XX)-135	53.80	1.47	2.18	0.08	15-12
AS5781P(XX)-136	55.37	1.47	2.18	0.08	15-12
AS5781P(XX)-137	56.97	1.47	2.18	0.08	15-12
AS5781P(XX)-138	58.55	1.47	2.18	0.08	15-12
AS5781P(XX)-139	60.15	1.47	2.18	0.08	15-12

Table 2C - Piston (male) applications - backup ring dimensions in millimeters and degrees (continued)

Part No.	Gauge ID ±0.03	T ±0.05	W ±0.03	G ±0.08	A Degrees
AS5781P(XX)-210	19.05	1.58	3.02	0.08	22-19
AS5781P(XX)-211	20.63	1.58	3.02	0.08	22-19
AS5781P(XX)-212	22.20	1.58	3.02	0.08	22-19
AS5781P(XX)-213	23.80	1.58	3.02	0.08	22-19
AS5781P(XX)-214	25.38	1.58	3.02	0.08	22-19
AS5781P(XX)-215	26.95	1.58	3.02	0.08	22-19
AS5781P(XX)-216	28.55	1.58	3.02	0.08	22-19
AS5781P(XX)-217	30.12	1.58	3.02	0.08	22-19
AS5781P(XX)-218	31.75	1.58	3.02	0.08	22-19
AS5781P(XX)-219	33.35	1.58	3.02	0.08	22-19
AS5781P(XX)-220	34.98	1.58	3.02	0.08	22-19
AS5781P(XX)-221	36.55	1.58	3.02	0.08	22-19
	Gauge OD ±0.03				
AS5781P(XX)-222	44.22	1.58	3.02	0.08	22-19
AS5781P(XX)-223	47.42	1.58	3.02	0.08	15-12
AS5781P(XX)-224	50.60	1.58	3.02	0.08	15-12
AS5781P(XX)-225	53.80	1.58	3.02	0.08	15-12
AS5781P(XX)-226	56.97	1.58	3.02	0.08	15-12
AS5781P(XX)-227	60.15	1.58	3.02	0.08	15-12
AS5781P(XX)-228	63.32	1.58	3.02	0.08	15-12
AS5781P(XX)-229	66.50	1.58	3.02	0.08	15-12
AS5781P(XX)-230	69.67	1.58	3.02	0.08	15-12

Table 2C - Piston (male) applications - backup ring dimensions in millimeters and degrees (continued)

Part No.	Gauge OD ±0.03	T ±0.05	W ±0.03	G ±0.09	A Degrees
AS5781P(XX)-325	47.42	2.24	4.70	0.09	22-19
AS5781P(XX)-326	50.60	2.24	4.70	0.09	22-19
AS5781P(XX)-327	53.80	2.24	4.70	0.09	22-19
AS5781P(XX)-328	56.97	2.24	4.70	0.09	22-19
AS5781P(XX)-329	60.15	2.24	4.70	0.09	22-19
AS5781P(XX)-330	63.35	2.24	4.70	0.09	22-19
AS5781P(XX)-331	66.55	2.24	4.70	0.09	22-19
AS5781P(XX)-332	69.77	2.24	4.70	0.09	22-19
AS5781P(XX)-333	72.97	2.24	4.70	0.09	22-19
AS5781P(XX)-334	76.02	2.24	4.70	0.09	15-12
AS5781P(XX)-335	79.20	2.24	4.70	0.09	15-12
AS5781P(XX)-336	82.37	2.24	4.70	0.09	15-12
AS5781P(XX)-337	85.55	2.24	4.70	0.09	15-12
AS5781P(XX)-338	88.72	2.24	4.70	0.09	15-12
AS5781P(XX)-339	91.90	2.24	4.70	0.09	15-12
AS5781P(XX)-340	95.07	2.24	4.70	0.09	15-12
AS5781P(XX)-341	98.25	2.24	4.70	0.09	15-12
AS5781P(XX)-342	101.45	2.24	4.70	0.09	15-12
AS5781P(XX)-343	104.65	2.24	4.70	0.09	15-12
AS5781P(XX)-344	107.87	2.24	4.70	0.09	15-12
AS5781P(XX)-345	111.07	2.24	4.70	0.09	15-12
AS5781P(XX)-346	114.30	2.24	4.70	0.09	15-12
AS5781P(XX)-347	117.50	2.24	4.70	0.09	15-12
AS5781P(XX)-348	120.73	2.24	4.70	0.09	15-12
AS5781P(XX)-349	123.93	2.24	4.70	0.09	15-12

Table 2C - Piston (male) applications - backup ring dimensions in millimeters and degrees (continued)

Part No.	Gauge ID ±0.03	T ±0.05	W ±0.03	G ±0.10	A Degrees
AS5781P(XX)-425	126.34	3.28	6.02	0.10	15-12
AS5781P(XX)-426	129.52	3.28	6.02	0.10	15-12
AS5781P(XX)-427	132.69	3.28	6.02	0.10	15-12
AS5781P(XX)-428	135.87	3.28	6.02	0.10	15-12
AS5781P(XX)-429	139.04	3.28	6.02	0.10	15-12
AS5781P(XX)-430	142.22	3.28	6.02	0.10	15-12
AS5781P(XX)-431	145.42	3.28	6.02	0.10	15-12
AS5781P(XX)-432	148.62	3.28	6.02	0.10	15-12
AS5781P(XX)-433	151.84	3.28	6.02	0.10	15-12
AS5781P(XX)-434	155.04	3.28	6.02	0.10	15-12
AS5781P(XX)-435	158.27	3.28	6.02	0.10	15-12
AS5781P(XX)-436	161.47	3.28	6.02	0.10	15-12
AS5781P(XX)-437	164.69	3.28	6.02	0.10	15-12

Table 2D - Rod (female) applications - backup ring dimensions in millimeters and degrees

See Figures 1 and 2.

Part No.	Gauge ID ±0.03	T ±0.05	W ±0.03	G ±0.06	A Degrees
AS5781R(XX)-004	1.93	1.27	1.45	0.06	39-35
AS5781R(XX)-005	2.74	1.27	1.37	0.06	36-32
AS5781R(XX)-006	3.12	1.27	1.34	0.06	33-29
AS5781R(XX)-007	3.91	1.27	1.34	0.06	27-24
AS5781R(XX)-008	4.70	1.27	1.37	0.06	22-19
AS5781R(XX)-009	5.51	1.27	1.40	0.06	22-19
AS5781R(XX)-010	6.30	1.27	1.40	0.06	22-19
AS5781R(XX)-011	7.87	1.27	1.40	0.06	22-19
AS5781R(XX)-012	9.47	1.27	1.40	0.06	22-19
AS5781R(XX)-013	11.05	1.27	1.40	0.06	22-19
AS5781R(XX)-014	12.65	1.27	1.40	0.06	22-19
AS5781R(XX)-015	14.22	1.27	1.40	0.06	22-19
AS5781R(XX)-016	15.82	1.27	1.40	0.06	22-19
AS5781R(XX)-017	17.40	1.27	1.40	0.06	22-19
AS5781R(XX)-018	19.00	1.27	1.40	0.06	22-19
AS5781R(XX)-019	20.57	1.27	1.40	0.06	22-19
AS5781R(XX)-020	22.17	1.27	1.40	0.06	22-19
AS5781R(XX)-021	23.75	1.27	1.40	0.06	22-19
AS5781R(XX)-022	25.35	1.27	1.40	0.06	22-19
AS5781R(XX)-023	26.92	1.27	1.40	0.06	22-19
AS5781R(XX)-024	28.52	1.27	1.40	0.06	22-19
AS5781R(XX)-025	30.10	1.27	1.40	0.06	22-19
AS5781R(XX)-026	31.70	1.27	1.40	0.06	22-19
AS5781R(XX)-027	33.30	1.27	1.40	0.06	22-19
AS5781R(XX)-028	34.90	1.27	1.40	0.06	22-19

Table 2D - Rod (female) applications - backup ring dimensions in millimeters and degrees (continued)

Part No.	Gauge ID ±0.03	T ±0.05	W ±0.03	G ±0.08	A Degrees
AS5781R(XX)-104	3.12	1.47	2.16	0.08	35-31
AS5781R(XX)-105	3.91	1.47	2.16	0.08	29-26
AS5781R(XX)-106	4.70	1.47	2.18	0.08	26-23
AS5781R(XX)-107	5.51	1.47	2.18	0.08	23-20
AS5781R(XX)-108	6.30	1.47	2.18	0.08	22-19
AS5781R(XX)-109	7.87	1.47	2.21	0.08	22-19
AS5781R(XX)-110	9.47	1.47	2.16	0.08	22-19
AS5781R(XX)-111	11.05	1.47	2.18	0.08	22-19
AS5781R(XX)-112	12.65	1.47	2.18	0.08	22-19
AS5781R(XX)-113	14.22	1.47	2.18	0.08	22-19
AS5781R(XX)-114	15.82	1.47	2.18	0.08	22-19
AS5781R(XX)-115	17.40	1.47	2.18	0.08	22-19
AS5781R(XX)-116	19.00	1.47	2.18	0.08	22-19
AS5781R(XX)-117	20.57	1.47	2.18	0.08	22-19
AS5781R(XX)-118	22.17	1.47	2.18	0.08	22-19
AS5781R(XX)-119	23.75	1.47	2.18	0.08	22-19
AS5781R(XX)-120	25.35	1.47	2.18	0.08	22-19
AS5781R(XX)-121	26.92	1.47	2.18	0.08	22-19
AS5781R(XX)-122	28.52	1.47	2.18	0.08	22-19
AS5781R(XX)-123	30.10	1.47	2.18	0.08	22-19
AS5781R(XX)-124	31.70	1.47	2.18	0.08	22-19
AS5781R(XX)-125	33.30	1.47	2.18	0.08	22-19
AS5781R(XX)-126	34.90	1.47	2.18	0.08	22-19
AS5781R(XX)-127	36.50	1.47	2.18	0.08	22-19
AS5781R(XX)-128	38.13	1.47	2.18	0.08	22-19
AS5781R(XX)-129	39.70	1.47	2.18	0.08	22-19
AS5781R(XX)-130	41.33	1.47	2.18	0.08	22-19
AS5781R(XX)-131	42.90	1.47	2.18	0.08	22-19
AS5781R(XX)-132	44.53	1.47	2.18	0.08	22-19
AS5781R(XX)-133	46.13	1.47	2.18	0.08	22-19
AS5781R(XX)-134	47.73	1.47	2.18	0.08	22-19
AS5781R(XX)-135	49.35	1.47	2.18	0.08	22-19
AS5781R(XX)-136	50.93	1.47	2.18	0.08	22-19
AS5781R(XX)-137	52.55	1.47	2.18	0.08	22-19
AS5781R(XX)-138	53.92	1.47	2.18	0.08	15-12
AS5781R(XX)-139	55.52	1.47	2.18	0.08	15-12

Table 2D - Rod (female) applications - backup ring dimensions in millimeters and degrees (continued)

Part No.	Gauge ID ±0.03	T ±0.05	W ±0.03	G ±0.08	A Degrees
AS5781R(XX)-210	19.00	1.58	3.05	0.08	22-19
AS5781R(XX)-211	20.57	1.58	3.05	0.08	22-19
AS5781R(XX)-212	22.17	1.58	3.05	0.08	22-19
AS5781R(XX)-213	23.75	1.58	3.05	0.08	22-19
AS5781R(XX)-214	25.35	1.58	3.05	0.08	22-19
AS5781R(XX)-215	26.92	1.58	3.05	0.08	22-19
AS5781R(XX)-216	28.52	1.58	3.05	0.08	22-19
AS5781R(XX)-217	30.10	1.58	3.05	0.08	22-19
AS5781R(XX)-218	31.70	1.58	3.05	0.08	22-19
AS5781R(XX)-219	33.27	1.58	3.05	0.08	22-19
AS5781R(XX)-220	34.87	1.58	3.05	0.08	22-19
AS5781R(XX)-221	36.45	1.58	3.05	0.08	22-19
AS5781R(XX)-222	38.08	1.58	3.05	0.08	22-19
AS5781R(XX)-223	41.22	1.58	3.05	0.08	15-12
AS5781R(XX)-224	44.40	1.58	3.05	0.08	15-12
AS5781R(XX)-225	47.57	1.58	3.05	0.08	15-12
AS5781R(XX)-226	50.75	1.58	3.05	0.08	15-12
AS5781R(XX)-227	53.92	1.58	3.05	0.08	15-12
AS5781R(XX)-228	57.10	1.58	3.05	0.08	15-12
AS5781R(XX)-229	60.27	1.58	3.05	0.08	15-12
AS5781R(XX)-230	63.45	1.58	3.048	0.08	15-12