

- Features:**
- WWS offers miniature size at higher power rating
  - High performance for low cost
  - High power to size ratio
  - High temperature silicone coating
  - MWW/NMWW – completely molded construction with welded terminations
  - Complete welded terminations
  - Tinned copper leads
  - Available in non-inductive styles
  - Tighter tolerances may be available for non-inductive styles. Contact Stackpole with requirements.
  - Higher operating temperatures available
  - "B" packaging code denotes bulk packaging - contact Stackpole for package quantities
  - WW/NWW/WWS meet UL94V-0
  - RoHS compliant and halogen-free



Electrical Specifications – WW, WWS, MWW								
Type / Code	MIL-R-26 Ref.	Power Rating @ 125°C	Power Rating @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance <sup>(*)</sup>			
					0.1%	0.5%	1%	5%
WW12	-	0.4 W	0.5 W	$< 1\Omega = \pm 90\text{ppm}/^\circ\text{C}$ $1\Omega \text{ to } 10\Omega = \pm 50\text{ppm}/^\circ\text{C}$ $> 10\Omega = \pm 20\text{ppm}/^\circ\text{C}$	5 - 2K	3 - 2K	5 - 2K	
WW1	-	1 W	1.1 W		2 - 3K			
WW1A	RW-70	1 W	1.3 W		1 - 5K			
WW2	RW-69	1.5 W	2.1 W		1 - 10K	0.5 - 10K		
WWS2	-	2.5 W	2.6 W		1 - 10K	0.5 - 10K		
WW2A	-	2.5 W	2.6 W		1 - 10K	0.5 - 10K		
WW3	RW-79	3 W	3.2 W		1 - 22K	0.5 - 22K		
WWS3	-	3 W	3.2 W		3 - 10K	1 - 10K		
WW3A	-	3 W	3.4 W		1 - 30K	0.5 - 30K		
WW4	-	4 W	4.3 W		1 - 40K	0.5 - 40K		
WWS4	RW-79	4 W	4.3 W		1 - 22K	0.5 - 22K		
WW5	RW-67, RW-74	5 W	5.1 W		1 - 50K	0.5 - 50K		
WWS5	-	5 W	5.1 W		1 - 40K	0.5 - 40K		
WW7	-	6.5 W	7.2 W		1 - 70K	0.5 - 70K		
WWS7	RW-67, RW-74	6.5 W	7.2 W		1 - 50K	0.5 - 50K		
WW7B	-	7 W	7.7 W		1 - 70K	0.5 - 70K		
WW10	RW-78	10 W	11 W		1 - 100K	0.5 - 100K		
WWS10	-	10 W	11 W		1 - 70K	0.5 - 70K		
MWW1	RW-70	1 W	1.3 W			5 - 2K		
MWW3	RW-79	3 W	3.2 W			3 - 20K		
MWW5	RW-67, RW-74	5 W	5.5 W		2 - 40K			
MWW10	RW-68, RW-74	10 W	11 W		2 - 80K			

(\*) Other resistance values available - contact factory for details.

Electrical Specifications – Non-Inductive Styles						
Type / Code	MIL-R-26 Ref.	Power Rating @ 125°C	Power Rating @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance <sup>(*)</sup>	
					1%	5%
NWW12	-	0.4 W	0.5 W	$< 1\Omega = \pm 90\text{ppm}/^\circ\text{C}$ $1\Omega \text{ to } 10\Omega = \pm 50\text{ppm}/^\circ\text{C}$ $> 10\Omega = \pm 20\text{ppm}/^\circ\text{C}$	10 - 1K	
NWW1	-	1 W	1.1 W		2 - 1.5K	
NWW1A	RW-70	1 W	1.3 W		1 - 2.5K	
NWW2	RW-69	1.5 W	2.1 W		1 - 5K	
NWWS2	-	2.5 W	2.6 W		1 - 5K	
NWW2A	-	2.5 W	2.6 W		1 - 5K	
NWW3	RW-79	3 W	3.2 W		1 - 11K	
NWWS3	-	3 W	3.2 W		3 - 5K	
NWW3A	-	3 W	3.4 W		1 - 15K	
NWW4	-	4 W	4.3 W		1 - 20K	
NWWS4	RW-79	4 W	4.3 W		1 - 11K	
NWW5	RW-67, RW-74	5 W	5.1 W		1 - 25K	
NWWS5	-	5 W	5.1 W		1 - 20K	
NWW7	-	6.5 W	7.2 W		1 - 35K	
NWWS7	RW-67, RW-74	6.5 W	7.2 W		1 - 25K	
NWW7B	-	7 W	7.7 W		1 - 35K	

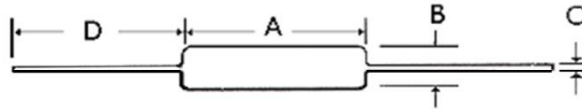
(\*) Other resistance values available - contact factory for details.

**Electrical Specifications – Non-Inductive Styles (cont.)**

Type / Code	MIL-R-26 Ref.	Power Rating @ 125°C	Power Rating @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance <sup>(*)</sup>
					1% and 5%
NWW10	RW-78	10 W	11 W	$< 1\Omega = \pm 90\text{ppm}/^\circ\text{C}$ $1\Omega \text{ to } 10\Omega = \pm 50\text{ppm}/^\circ\text{C}$ $> 10\Omega = \pm 20\text{ppm}/^\circ\text{C}$	1 - 50K
NWWS10	-	10 W	11 W		1 - 35K
NMWW1	RW-70	1 W	1.3 W		5 - 1K
NMWW3	RW-79	3 W	3.2 W		3 - 10K
NMWW5	RW-67, RW-74	5 W	5.5 W		2 - 20K
NMWW10	RW-68, RW-74	10 W	11 W		2 - 40K

(\*) Other resistance values available - contact factory for details.

**Mechanical Specifications**

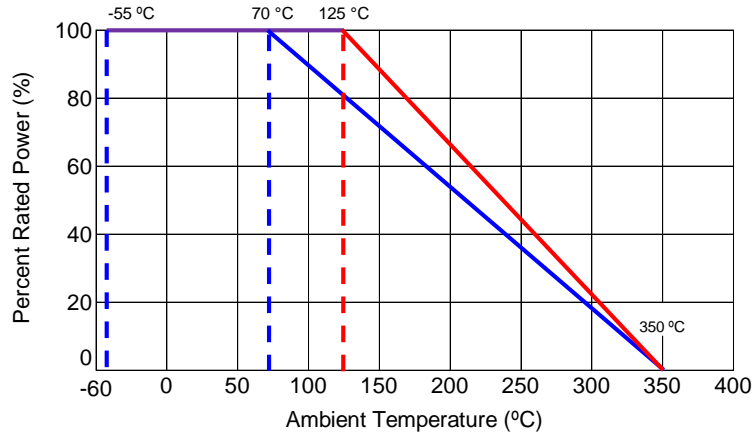


Type / Code	A	B	C	D (Bulk) <sup>(1)</sup>	Unit
WW12 / NWW12	0.312 ± 0.062 7.92 ± 1.57	0.110 ± 0.031 2.79 ± 0.79	0.025 ± 0.002 0.64 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW1, WWS2 / NWW1, NWWS2	0.375 ± 0.062 9.53 ± 1.57	0.110 ± 0.031 2.79 ± 0.79	0.025 ± 0.002 0.64 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW1A / NWW1A	0.420 ± 0.062 10.67 ± 1.57	0.110 ± 0.031 2.79 ± 0.79	0.025 ± 0.002 0.64 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW2, WWS3 / NWW2, NWWS3	0.370 ± 0.062 9.40 ± 1.57	0.156 ± 0.031 3.96 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW2A / NWW2A	0.550 ± 0.062 13.97 ± 1.57	0.156 ± 0.031 3.96 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW3, WWS4 / NWW3, NWWS4	0.560 ± 0.062 14.22 ± 1.57	0.187 ± 0.031 4.75 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW3A / NWW3A	0.500 ± 0.062 12.70 ± 1.57	0.218 ± 0.031 5.54 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW4, WWS5 / NWW4, NWWS5	0.700 ± 0.062 17.78 ± 1.57	0.270 ± 0.031 6.86 ± 0.79	0.036 ± 0.002 0.91 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW5, WWS7 / NWW5, NWWS7	0.875 ± 0.062 22.23 ± 1.57	0.312 ± 0.031 7.92 ± 0.79	0.036 ± 0.002 0.91 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW7 / NWW7	1.000 ± 0.062 25.40 ± 1.57	0.312 ± 0.031 7.92 ± 0.79	0.036 ± 0.002 0.91 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW7B, WWS10 / NWW7B, NWWS10	1.200 ± 0.062 30.48 ± 1.57	0.312 ± 0.031 7.92 ± 0.79	0.036 ± 0.002 0.91 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW10 / NWW10 <sup>(2)</sup>	1.780 ± 0.062 45.21 ± 1.57	0.375 ± 0.031 9.53 ± 0.79	0.040 ± 0.002 1.02 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW1 / NMWW1	0.385 ± 0.062 9.78 ± 1.57	0.135 ± 0.031 3.43 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW3 / NMWW3	0.560 ± 0.062 14.22 ± 1.57	0.205 ± 0.031 5.21 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW5 / NMWW5	0.925 ± 0.062 23.50 ± 1.57	0.330 ± 0.031 8.38 ± 0.79	0.036 ± 0.002 0.91 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW10 / NMWW10	1.965 ± 0.062 49.91 ± 1.57	0.480 ± 0.031 12.19 ± 0.79	0.040 ± 0.002 1.02 ± 0.05	1.500 typ. 38.10 typ.	inches mm

(1) See "Resistor Packaging Specification Document" for lead length dimension for tape and reel packaged product.

(2) Lead diameter (C) available in 0.036" / 0.91mm.

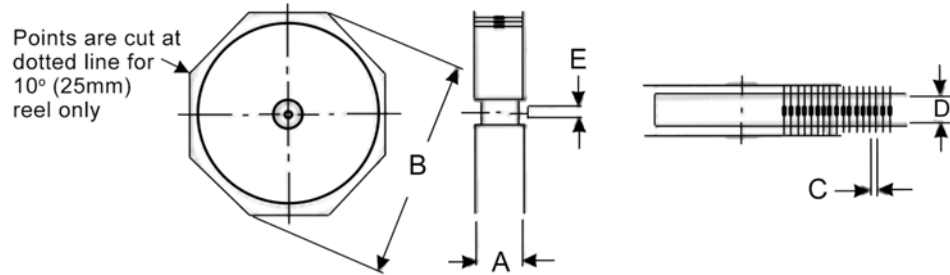
**Power Derating Curve:**



Performance Characteristics		
Test	Test Condition	Test Specification
Moisture Resistance	1000 hours, 95% R.H., 40°C	1% max
Load Life	1000 hours, cycled power 1.5 hours ON, 0.5 hours OFF, 25°C	1%
Temperature Cycling	5 cycles, -55°C to 200°C	0.5%
Short Time Overload	5 times rated power for 5 seconds	1%
Dielectric Withstand Voltage	Resistor leads are grounded and high potential probe is touched to the resistor body	500V for (N)WW12, 1, 1A and 2S. 1000V for all others

Operating Temperature Range: -55°C to +350°C

**Lead-Tape Specifications**



Type / Code	A max <sup>(1)</sup>	B max	C	D <sup>(2)</sup>	Tape	Unit
WW12	2.880 73.15	11.000 279.40	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm
WW1, WWS2 NWW1, NWS2	2.880 73.15	11.000 279.40	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm
WW1A, NWW1A	2.880 73.15	11.000 279.40	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm

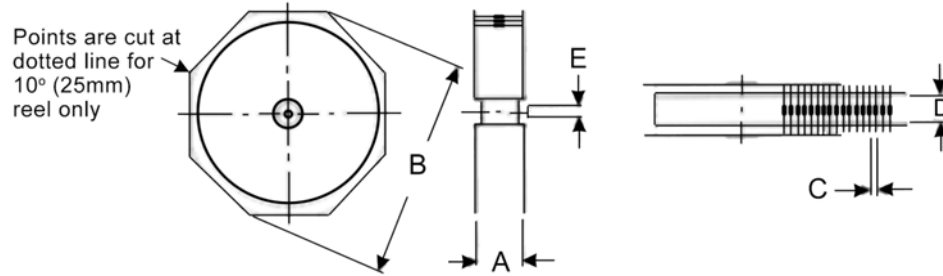
Dimension "E": This is a non-critical dimension that does not have a tolerance in the standard.  
 Range of diameters is from 0.547 inches (13.90 mm) to 1.500 inches (38.10 mm).

(1) Reference value only. The "A" dimension shall be governed by the overall length of the taped component.

The distance between flanges shall be 0.059 inches (1.50 mm) to 0.315 (8.00 mm) greater than the overall component.

(2) The given dimension "D" expresses the standard width spacing. A 26mm narrow spacing is available as option "N" packaging code.

**Lead-Tape Specifications (cont.)**

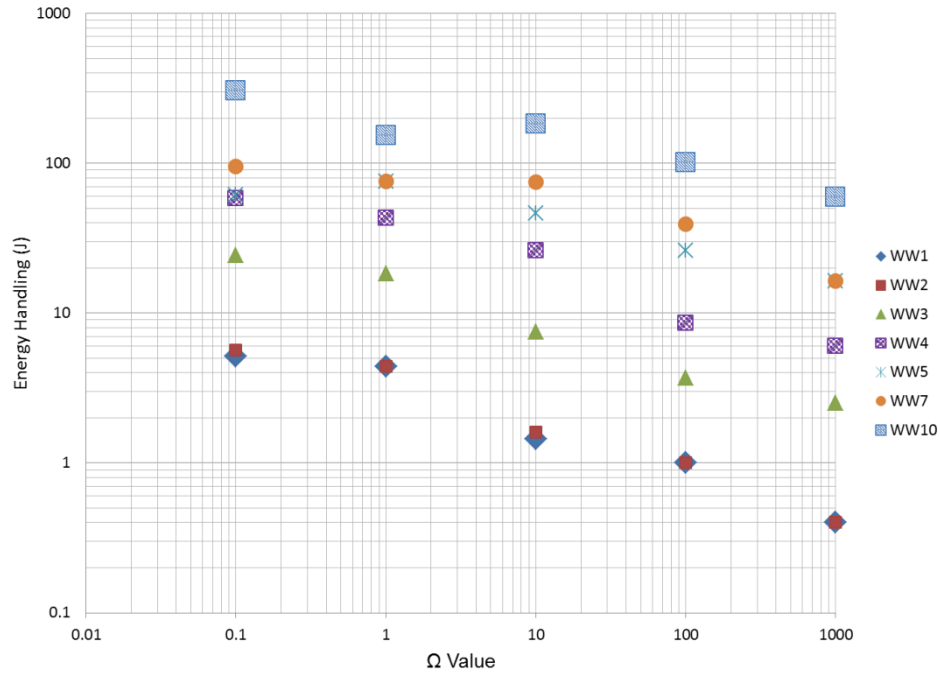


Type / Code	A max <sup>(1)</sup>	B max	C	D <sup>(2)</sup>	Tape	Unit
WW2, WWS3	2.880	11.000	0.197 ± 0.020	2.063 ± 0.079	0.250	inches
NWW2, NWS3	73.15	279.40	5.00 ± 0.50	52.40 ± 2.00	6.35	mm
WW2A, NWW2A	2.880	11.000	0.197 ± 0.020	2.063 ± 0.079	0.250	inches
	73.15	279.40	5.00 ± 0.50	52.40 ± 2.00	6.35	mm
WW3, WWS4	2.063	11.000	0.197 ± 0.020	2.500 ± 0.079	0.250	inches
NWW3, NWS4	52.40	279.40	5.00 ± 0.50	63.50 ± 2.00	6.35	mm
WW3A, NWW3A	3.740	11.000	0.394 ± 0.020	2.874 ± 0.079	0.250	inches
	95.00	279.40	10.00 ± 0.50	73.00 ± 2.00	6.35	mm
WW4, WWS5	2.500	11.000	0.394 ± 0.020	2.500 ± 0.079	0.250	inches
NWW4, NWS5	63.50	279.40	10.00 ± 0.50	63.50 ± 2.00	6.35	mm
WW5, WWS7	3.740	11.000	0.394 ± 0.020	2.874 ± 0.079	0.250	inches
NWW5, NWS7	95.00	279.40	10.00 ± 0.50	73.00 ± 2.00	6.35	mm
WW7, NWW7	5.100	11.000	0.394 ± 0.020	2.874 ± 0.079	0.250	inches
	129.54	279.40	10.00 ± 0.50	73.00 ± 2.00	6.35	mm
WW7B, WWS10	5.100	11.000	0.394 ± 0.020	2.874 ± 0.079	0.250	inches
NWW7B, NWS10	129.54	279.40	10.00 ± 0.50	73.00 ± 2.00	6.35	mm
WW10, NWW10	5.100	11.000	0.394 ± 0.020	2.874 ± 0.079	0.250	inches
	129.54	279.40	10.00 ± 0.50	73.00 ± 2.00	6.35	mm
MWW1, NMWW1	3.311	13.504	0.197 ± 0.020	2.063 ± 0.079	0.250	inches
	84.10	343.00	5.00 ± 0.50	52.40 ± 2.00	6.35	mm
MWW3, NMWW3	3.484	13.504	0.394 ± 0.020	2.063 ± 0.079	0.250	inches
	88.50	343.00	10.00 ± 0.50	52.40 ± 2.00	6.35	mm
MWW5, NMWW5	3.850	13.504	0.394 ± 0.020	2.874 ± 0.079	0.250	inches
	97.80	343.00	10.00 ± 0.50	73.00 ± 2.00	6.35	mm
MWW10, NMWW10	4.764	13.504	0.394 ± 0.020	4.310 ± 0.079	0.250	inches
	121.00	343.00	10.00 ± 0.50	109.47 ± 2.00	6.35	mm

Dimension "E": This is a non-critical dimension that does not have a tolerance in the standard.  
 Range of diameters is from 0.547 inches (13.90 mm) to 1.500 inches (38.10 mm).

- (1) Reference value only. The "A" dimension shall be governed by the overall length of the taped component.  
 The distance between flanges shall be 0.059 inches (1.50 mm) to 0.315 (8.00 mm) greater than the overall component.
- (2) The given dimension "D" expresses the standard width spacing. A 26mm narrow spacing is available as option "N" packaging code.

**Energy Handling Capability:**  
 (Typical performance - for reference only.)



**RoHS Compliance**

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union’s directive regarding “Restrictions on Hazardous Substances” (RoHS 3). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

RoHS Compliance Status						
Standard Product Series	Description	Package / Termination Type	Standard Series RoHS Compliant	Lead-Free Termination Composition	Lead-Free Mfg. Effective Date (Std Product Series)	Lead-Free Effective Date Code (YY/WW)
MWW	General Purpose and Precision Leaded Wirewound Resistor - Molded	Axial	YES	100% Matte Sn	Jan-06	06/01
NWW	General Purpose and Precision Leaded Wirewound Resistor - Conformal Coated - Non-Inductive	Axial	YES	100% Matte Sn	Jan-06	06/01
WW	General Purpose and Precision Leaded Wirewound Resistor - Conformal Coated - Non-Inductive	Axial	YES	100% Matte Sn	Jan-06	06/01

**“Conflict Metals” Commitment**

We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the “conflict region” of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

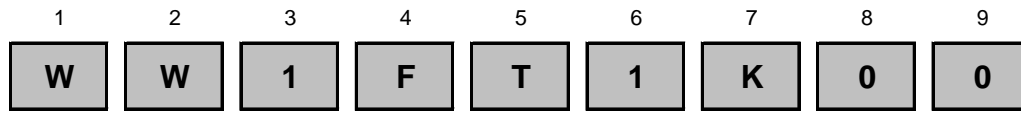
**Compliance to “REACH”**

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, “The Registration, Evaluation, Authorization and Restriction of Chemicals”, otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

**Environmental Policy**

It is the policy of Stackpole Electronics, Inc. (SEI) to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.

**How to Order**



Product Series		Type/Code	Power Rating		Tolerance		Packaging			Resistance Value
Code	Description		@ 125°C	@ 70°C	Code	Tol	Code	Description	Quantity	
WW	Standard	WW12 / NWW12	0.4W	0.5W	B	0.1%	T	11" Tape and Reel	2,500	Four characters with the multiplier used as the decimal holder. 0.5 ohm = R500 1 ohm = 1R00 10 Kohm = 10K0
WWS	Mini	WW1 / NWW1	1W	1.1W	D	0.5%				
MWW	Molded	WW1A / NWW1A	1W	1.3W	F	1%				
NWW	Non-Inductive	WW2 / NWW2	1.5W	2.1W	J	5%				
NWWS	Mini	WWS2 / NWWS2	2.5W	2.6W						
NMWW	Non-Inductive	WW2A / NWW2A	2.5W	2.6W					2,000	
		WW3 / NWW3	3W	3.2W						
		WWS3 / NWWS3	3W	3.2W						
		WW3A / NWW3A	3W	3.4W						
		WW4 / NWW4	4W	4.3W						
		WWS4 / NWWS4	4W	4.3W					500	
		WW5 / NWW5	5W	5.1W						
		WWS5 / NWWS5	5W	5.1W						
		WW7 / NWW7	6.5W	7.2W						
		WWS7 / NWWS7	6.5W	7.2W						
		WW7B / NWW7B	7W	7.7W					250	
		WW10 / NWW10	10W	11W						
		WWS10 / NWWS10	10W	11W						
		MWW1 / NMWW1	1W	1.3W						
		MWW3 / NMWW3	3W	3.2W						
		MWW5 / NMWW5	5W	5.5W			Contact Stackpole for package quantities.			
		MWW10 / NMWW10	10W	11W						
B	Bulk									