



Ace Clamp Performance Data:

Linear Testing per T-0790 (B)							
Clamp Tested	Panel Type	Panel Material	Panel Thickness	Torque in lbs.	Max. Linear Resistance Lbs. (1)	Panel Failure	Comments
ML	Firestone UC6 & UC3	Steel	22ga	175	1382	No	
ML	Firestone UC6 & UC3	Steel	24ga	175	1363	No	
ML	Firestone UC6 & UC3	AL	32ga	135	1666	Yes	
ML	Englert A 1000	Steel	24ga	175	685	No	
A2	Englert A 1000	Steel	24ga	135	958	No	
A2	MORIN SLR	Steel	24ga	135	1320		pins installed to non-folded side
ML	METCO	steel	24ga	175	432	no	
ML	METCO	steel	22ga	175	671	no	

Vertical Testing per T-0789(b)							
Clamp Tested	Panel Type	Panel Material	Panel Thickness	Torque in lbs.	Max Load - Lbs.	Panel Failure	Comments
ML	METCO	steel	22ga	175	755	no	
A2-N	Berrige Cee-Lock	steel	24ga	135	1200	no	
A2-N	Berrige Cee-Lock	steel	24ga	135	2000	yes	seam began to separate
ML	single-lock	Steel	22ga	175	998	no	
ML	single-lock	Steel	24ga	175	924	no	
ML	Dbbl-Lock	Al	0.032	135	1138	no	
ML	Dbbl-Lock	Al	0.04	135	874	no	
ML	Snap-Lock	Steel	24ga	175	685	no	
ML	Morin-Zip	AL	0.04	135	744	no	
ML	Morin-Zip	AL	0.04	135	1643	yes	
A2	Butler MR-24	Steel	24ga	135	801	no	pins installed to folded side
A2	Butler MR-24	Steel	24ga	135	1571	no	pins installed to non-folded side
A2	Butler MR-24	Steel	24ga	225	1645	no	
A2-mini	Butler MR-24	Steel	24ga	175	1697	no	
A2	MORIN SWL	Steel	24ga	135	958	no	
A2	MORIN SWL	Steel	24ga	250	1365	yes	
A2	MORIN SLR	Steel	24ga	135	1376	no	pins installed to folded side

Linear Testing per T-0790 (B) - Snow Rails Tested brackets and clamps on two parallel 88R ribs							
SP 10	Butler MR-24	Steel	24ga	135	2644	no	
SP 1	Butler MR-24	Steel	24ga	135	1227	no	
SP 10	MORIN SCR	Steel	24ga	135	2946	no	metal screw at top of rib
SP 10	Merchant Evans 305	Steel	24ga	135	2487		
Z2-2	Merchant Evans 305	Steel	24ga	175	2174		

Vertical Testing for Solar Kit Maximum vertical load to failure - Serrated Washers vs. Extruded AL standard							
Standard mid	N/A	Extruded AL		100 in-lbs.	3749	yes	
Ace Serrated	N/A	Stamping - SS		100 in-lbs.	6033	yes	

Purpose of test to determine force to lift rail at			
Test Sample: AceClamp serrated washer	Torque - in. lbs.	Load - lbf	Failure
	0	112	no
	20	160	no
	30	330	no
	40	490	no
	50	550	no
	60	590	no

The assumption is that wind uplift loads can lift a PV panel off the bottom spacer or off the rail. We tested to find the load required to lift the panel at varying torque loads. Engineering data can relate the vertical load to the wind uplift loading based on the ASCE 7-10 or local code wind tables.