

# **AUTHORIZATION TO MARK**

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	The Hollaender Manufacturing Co.		Manufacturer:	The Hollaender Manufacturing Co.
Address:	10285 Wayne Avenue Cincinnati OH 45215		Address:	10285 Wayne Avenue Cincinnati OH 45215
Country:	USA		Country:	USA
Party Authorized To Apply Mark: Report Issuing Office:		Same as Manufacturer Intertek Testing Servic		Forest, CA
Control Numb	oer: <u>5006568</u>	Authorized by:	Má	the superior
				tthew Snyder, Certification Manager
	This document superse	edes all previous Author	izations to Mark for	or the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Client is authorization to Mark. Any further use of the hertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc. 545 East Algonquin Road, Arlington Heights, IL 60005 Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat- Plate Photovoltaic Modules and Panels [UL 2703:2015 Ed.1+R:24Mar2021]		
Product:	PV Bonding Devices		
Brand Name:	Solar Mounting Systems		
Models:	5, 5E, 5EXT, 5SR, 5X, 17, 17E, 17X, 19,19E, 45, 47		

# intertek Total Quality. Assured.

## **RECOGNIZED COMPONENT** Constructional Data Report (CDR)

1.0 Reference and Address						
Report Number	102505248LAX-001	Original Issued:	8-Dec-2016	Revised: 27-Jun-2022		
Standard(s)	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels [UL 2703:2015 Ed.1+R:24Mar2021]					
Applicant	The Hollaender Manufacturing Co.		Manufacturer 1	The Hollaender Manufacturing Co.		
Address	10285 Wayne Avenue Cincinnati OH 45215		Address	10285 Wayne Avenue Cincinnati OH 45215		
Country	USA		Country	USA		
Contact	Todd Zureick Mike Hall		Contact	Todd Zureick Mike Hall		
Phone	513/772-8800 x160 513/772-8800 x186		Phone	513/772-8800 x160 513/772-8800 x186		
FAX	NA		FAX	NA		
Email	toddz@hollaender.co mikeh@hollaender.c		Email	toddz@hollaender.com mikeh@hollaender.com		

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2.0 Product Des	cription
Product	PV Bonding Devices
Brand name	Solar Mounting Systems
	The products covered by this report are the Hollaender Speed-Rail Fittings and Flanges that are intended to provide electrical bonding to Solar Pipe Racking with conductive surface. This report covers several fittings and flanges with different barrel diameters and lengths, and different set screw locations.
	The fitting or flange is secured in use to solar racking pipe by means of set screw connection. Approved pipe outer-diameters for use with fittings are 1.66" (size 7 fitting), 1.90" (size 8), and 2.375" (size 9).
Description	The grounding of the entire system is intended to be in accordance with the latest edition of the National Electrical Code, including NEC 250: Grounding and Bonding, and NEC 690: Solar Photovoltaic Systems. Any local electrical codes must be adhered in addition to the national electrical codes.
	This product investigation was performed only with respect to specific properties, a limited range of hazards, or suitability for use under limited or special conditions. The following risks and other properties of this product have not been evaluated: The Mechanical Loading Test, mechanical strength of materials, flammability, electric shock, Ultraviolet light exposure, fire resistance class ratings as a roof covering (e.g. Class A, B, or C Film) material.
Models	5, 5E, 5EXT, 5SR, 5X, 17, 17E, 17X, 19,19E, 45, 47
Model Similarity	5 indicates a "Tee" design (See Illustrations 1-5) 17 indicates adjustable brace fitting (See Illustrations 6 & 7) 19 indicates cross adjustable brace fitting (See Illustration 12) 45 indicates square base flange 47 indicates rectangle base flange E indicates single set-screw design EXT indicates side rib supporting set-screw
Detiene	X indicates 90 degree offset between 2 barrel set screws
Ratings	Fuse Rating: 25A
Other Ratings	NA

2.0 Product Des	scription
	The products covered in this Report are incomplete in construction features or limited in performance capabilities and are intended for use and evaluation in other products. Consideration should be given to the following when the component is used in or with another product.
	1. Methods of installation to follow the instruction manual documented in this report. Periodic re- inspection is not stated in installation manual
	2. Hollaender Speed-Rail Fittings and Flanges are made of ALMAG 535 aluminum magnesium alloy and intended to be secured to aluminum or galvanized solar-rack piping by set-screw connections. Terminal connections are factory crimped. Hollaender Speed-Rail Fittings and Flanges exceeds minimum size requirements for bonding. These fittings and flanges will be subject to Bonding Path resistance, Temperature Cycling Test, and Humidity Test when used with other mounting surfaces.
Conditions of Acceptability	3. The system consists of Aluminum and Galvanized steel materials; therefore, no corrosion- resistant coatings or plating are required.
	4. Overall bonding and grounding of a Photovoltaic Mounting System using the Speed-Rail Fitting and Flanges must be investigated to section 8.0 in the end use product; also in accordance with the latest National Electrical Code, ANSI/NFPA70, including NEC 250.134 or 250.136 (A) regardless of voltage, and NEC 690: Solar Photovoltaic Systems. Any local electrical codes must be adhered to in addition to the National Electrical Code.
	5. The component is to be part of larger system as a recognized component of overall system. UL 2703 Grounding and bonding of complete racking system shall be verified in end use product including evaluation to standard under section 9 for bonding requirments. Additional testing may be required when used with other racking systems which may include but not limited to Humidity Freez, Thermal Cycling, bonding path resistance and bonding conductor testings.

## 3.0 Product Photographs

Photo 1 - Tee Fittings (two from left) and Adjustable Brace Fittings (two from right)



4.0 0	4.0 Critical Components										
Photo #	Item no. <sup>1</sup>	Name	Manufacturer/ trademark <sup>2</sup>	Type / model <sup>2</sup>	Technical data and securement means	Mark(s) of conformity 3					
				5	ALMAG 535 Aluminum						
	1 1 Tee Fitting			5E	Magnesium Alloy Fitting with 3/8" - 16 x 7/16" long Zinc-Alloy JS600	NR					
1		Tee Fitting	Hollaender	5EXT	Zinc-plated set screws. See						
				5SR	Illustrations 1-5 for model						
				5X	dimensions.						
	1 2 Adjustable Tee Fitting								17	ALMAG 535 Aluminum	
			Hollaender	17E	Magnesium Alloy Adjustable Fitting with 3/8" -16 x 7/16" long Zinc-Alloy JS600 Zinc-plated set screws. Hinge created by a. ¼" steel drive pin, Stainless Steel AISI 303. See Illustrations 6, 7,						
1				17X		NR					
				19							
				19E	12, & 13 for model dimensions.						
1	A Flange Fitting	Flange Fitting	45	ALMAG 535 Aluminum Magnesium Alloy Adjustable Fitting with 3/8" -16 x 7/16" long	NR						
1 3	(not pictured)	Hollaender	47	Zinc-Alloy JS600 Zinc-plated set screws. See Illustrations 10 & 11 for model dimensions.	INIT						

NOTES:

1) Not all item numbers are indicated (called out) in the photos, as their location is obvious.

2) "Various" means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used.

3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and only visual examination is necessary. "See 5.0" indicates Unlisted components or assemblies to be evaluated periodically refer to section 5.0 for details.

## 5.0 Critical Unlisted CEC Components

No Unlisted CEC components are used in this report.

#### **6.0 Critical Features**

<u>Recognized Component</u> - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.

<u>Listed Component</u> - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.

<u>Unlisted Component</u> - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.

<u>Critical Features/Components</u> - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.

<u>Construction Details</u> - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.

- 1 Spacing No verification of spacing required.
- 2 Mechanical Assembly Hollaender Speed Rail Fittings (Flange, Tee, Adjustable Tee) are mounted to the Solar Racking Pipe as described in section 2 by using provided set screws and torque values specified by installation instructions (see illustration 9)
- 3. <u>Corrosion Protection</u> No Ferrous Metal parts. All bonding surfaces are composed of ALMAG 535 Aluminum Magnesium Alloy which is inherently corrosion-resistant. Installation instructions advised fittings are to be used with corrosion-resistant Aluminum or Galvanzed Solar Rack Piping.
- 4. Accessibility of Live Parts NA
- 5. Polarized Connection NA
- 6. Schematics NA
- 7. Internal Wiring NA
- 8. <u>Grounding</u> Overall bonding and grounding of a Photovoltaic Mounting System using the Speed-Rail Fitting and Flanges must be investigated to section 8.0 in the end use product; also in accordance with the latest National Electrical Code, ANSI/NFPA70, including NEC 250.134 or 250.136 (A) regardless of voltage, and NEC 690: Solar Photovoltaic Systems. Any local electrical codes must be adhered to in addition to the National Electrical Code.The Hollaender Speed Rail Fittings is a bonding method to create an electrical
- 9. <u>Markings</u> The smallest unit packaging shall have a plain, legible, permanent marking that includes: a) The manufacturer & model number: Hollaender
  - b) The model number or the equivalent:
  - c) The load rating: N/A
  - d) The date or other dating period of manufacturer not exceeding any three consecutive months.
- 10 Cautionary Markings NA
- 11. <u>Installation, Operating and Safety Instructions</u> Instructions for installation and use of this product are provided by the manufacturer in section 7.0.

#### Illustration 1 - 5E Tee Drawing

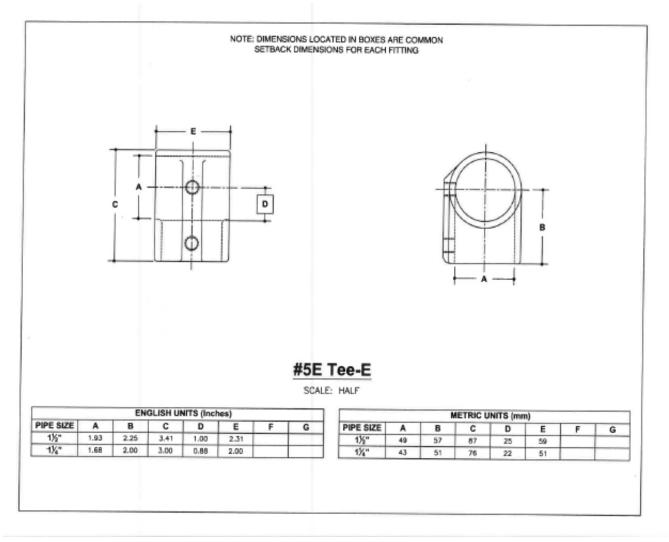
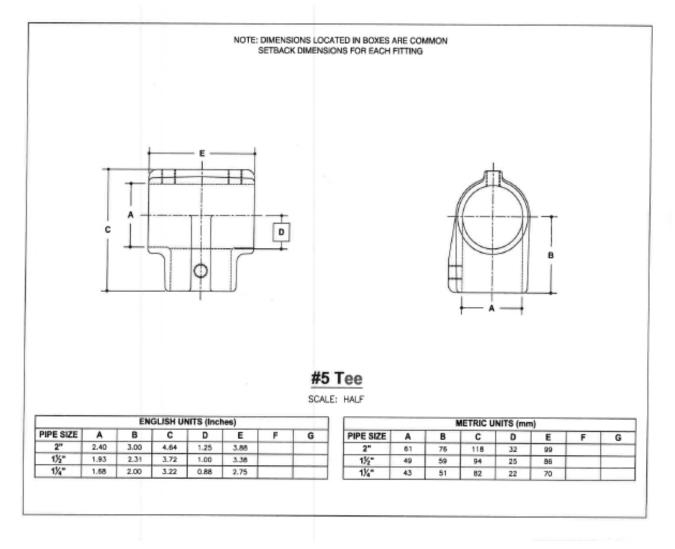


Illustration 2 - 5 Tee Drawing



#### Illustration 3 - 5EX Tee Drawing

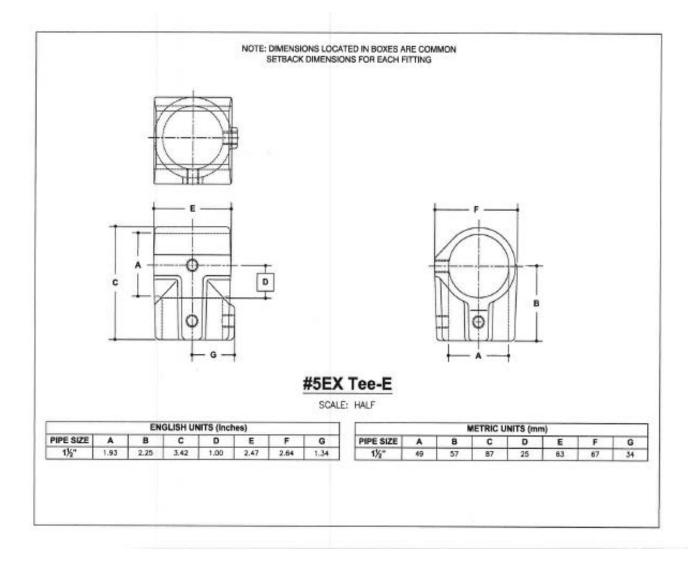
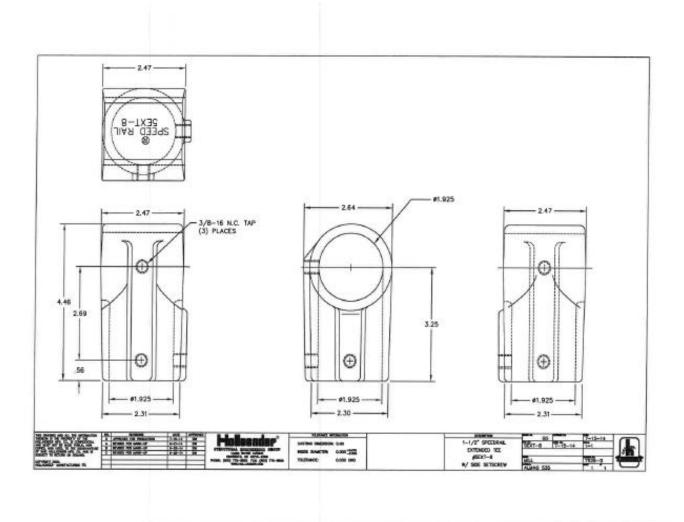
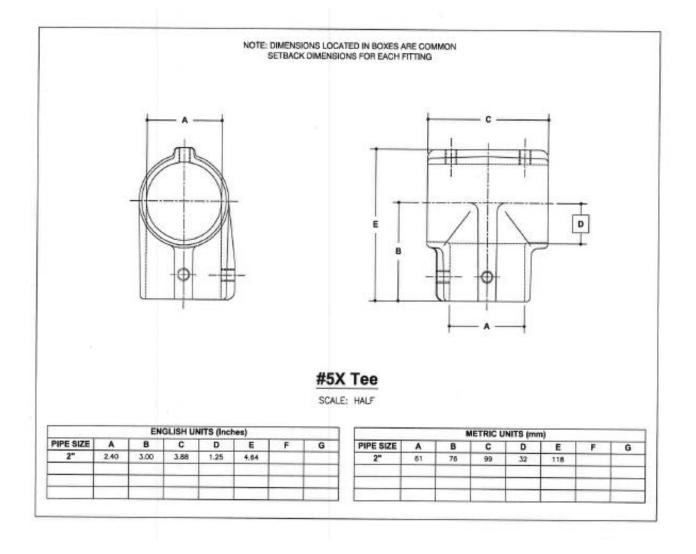


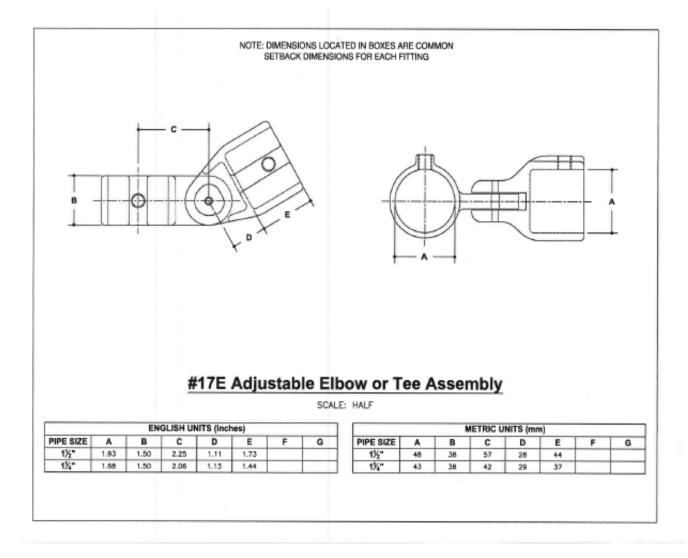
Illustration 4 - 5EXT Tee Drawing



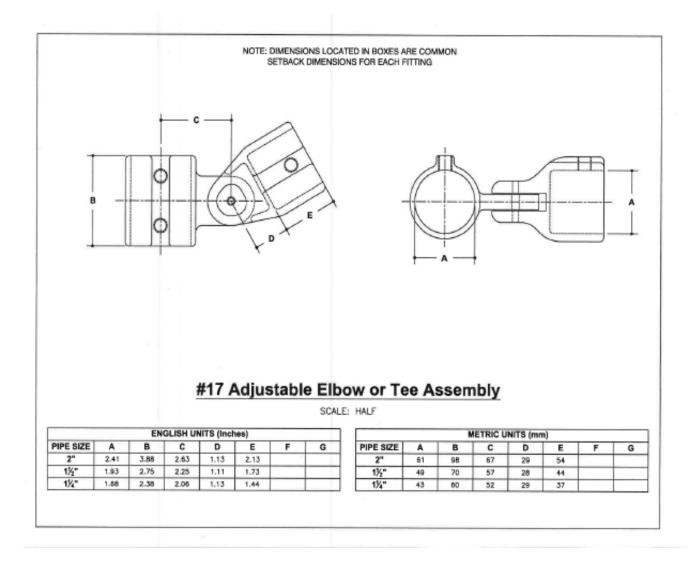
#### Illustration 5 - 5X Tee Drawing



#### Illustration 6 - 17E Adjustable Tee Assembly Drawing



#### Illustration 7 - 17 Adjustable Tee Assembly Drawing



## Illustration 8 - Installation Instructions Page 1

The Hollaender Mfg. Originators and Manufs Speed-Rail © Nu-Rail © Rackmaster @ Mend-a-Rail U Speed-Rail U Bumble Bee S Hollaender Sp	cturers of: D D D		Solar Mounting S	ystems
and a second the second	ructions apply to the use			
a. Tees:	SE	SEXT	5SR	5X
TIN				
b. Adjustable/ Bra	cing fittings: 17E	17X	19	19E
C. Flanges: 45 Square Base Flange	47 Rectangular Base Flange			
A.	dis-			
	olored pipe, this is strictly for pipe or 6061-T <mark>6</mark> Sch. 40 alumin		oth in testing and in practice,	customers should
Ph	one (513) 772-8800 (800) 772	85 Wayne Avenue * Cino -8800 * Fax (800) 772-88 he Fitting with the Rib - 1 -	806 * http://www.hollaender.c	om

#### Illustration 9 - Installation Instructions Page 2

2. Hollaender Speed-Rail<sup>®</sup> fittings achieve bonding with the pipe when the set screws are adequately tightened, and penetrate the surface of the steel or aluminum pipe.

3. Hollaender Speed-Rail® fittings have been evaluated to UL 2703 grounding and bonding only.

The following table lists the correct torque values that set screws need to be tightened to.

			Solar Pipe R	ack Fittings	
		Std		pe, A53 Schedule 40	
Pipe must be con	apletely insert	ted into the barrel of		cured with recommended torque for proper pullout p 8/5/2021	erformance.
Torque Set Screw					
itting Size	Ft. Lbs.^	No. Set Screws	Orientaion	Typical Fitting	Capacity*
" IPS	20	2	IN LINE	45CE-11	1,600
				•	
' IPS	17	1		17-9 Bracing Fitting, 5-9 Tee	1,360
	17	2	IN LINE	47-9, 45CE-9 Base Flanges, 17X-9 Bracing Fitting	1,705
	17	2	AT 90 DEGREES	5X-9 Tee	2,080
-1/2" IPS	17	1		5E-8 & 5-89 Tees, 17-8, 17-98, 19-98 Bracing Fittings	1,315
	17	2	IN LINE	45-8, 46-8, 47-8 Base Flanges	1,505
	17	2	AT 90 DEGREES	5EXT-8, 5EX-8 Tee	2,080
1/4" IPS	17	1		5E-7 Tee, 17-7 Bracing Fitting	1,265
	17	2	IN LINE	45-7, 46-7, 47-7 Base Flanges	1,500
		All pipe :	sizes recommended	d for hurricane prone areas.	
hear on 303 SS Adj. I	Pin			Tested	1,960
/A" Tekscrew inserte	d through (1)	wall of steel pipe		Tested	3,500
/8" bolt with washer and nut inserted through (2) walls of pipe Calculated estimate 5,000					

Maintenance:

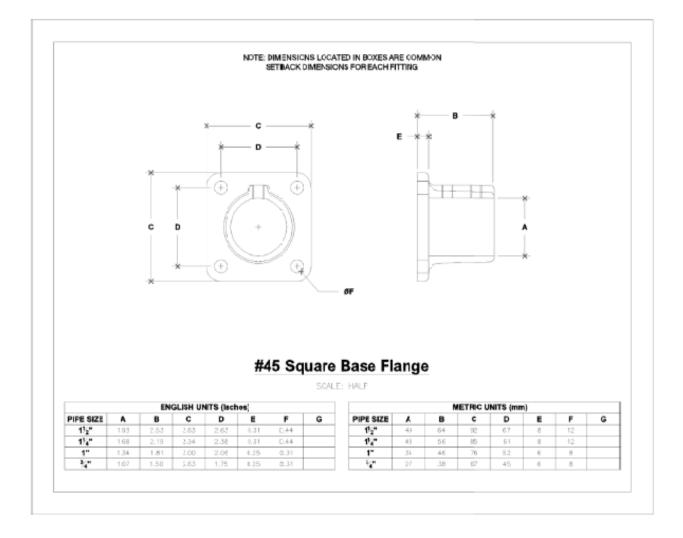
 It is recommended that set screws be checked periodically to ensure that proper torque values are maintained.

2. Any components showing signs of damage that compromise safety shall be replaced immediately.

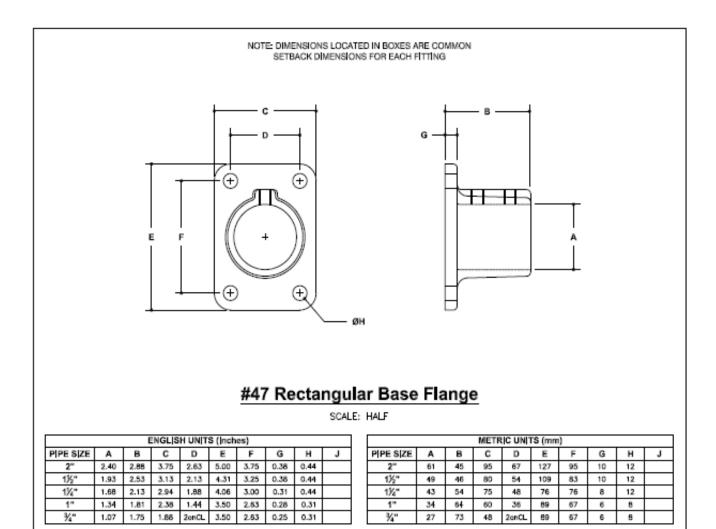
P.O. Box 156399 \* 10285 Wayne Avenue \* Cincinnati, OH 45215-6399 Phone (513) 772-8800 (800) 772-8800 \* Fax (800) 772-8806 \* http://www.hollaender.com "The Fitting with the Rib ®"

- 2 -

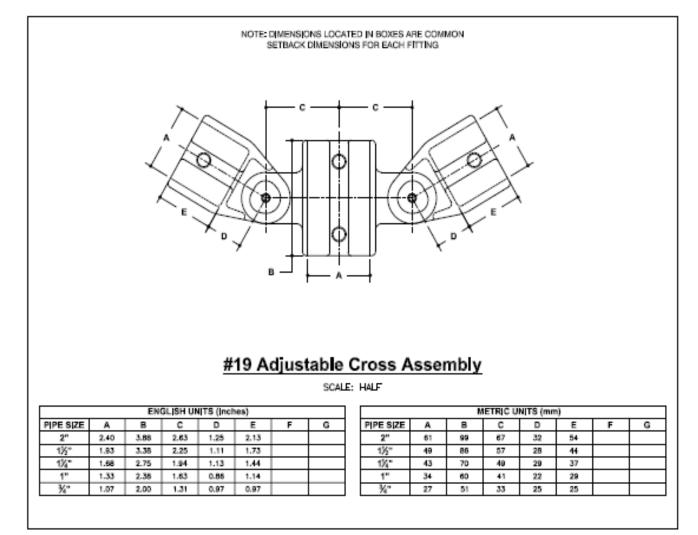
#### Illustration 10 - 45 Square Base Flange

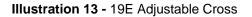


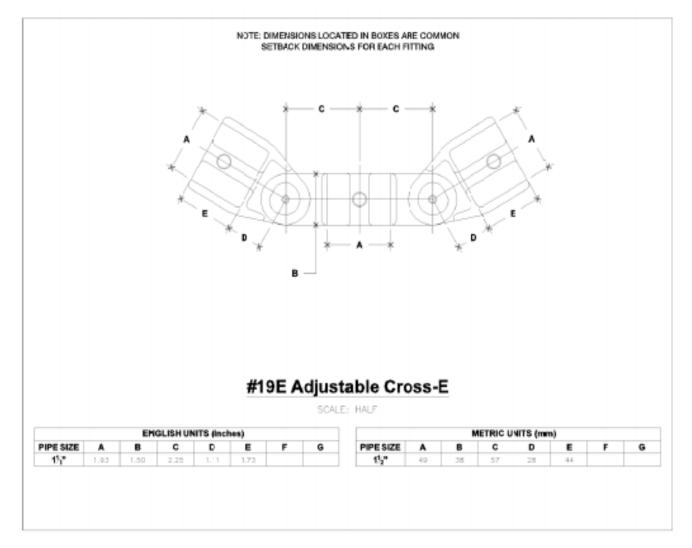
#### Illustration 11 - 47 Rectangle Base Flange











8.0 Test Summary						
Evaluation Period	6/01/2016- 11/14	/2016	Project No.	G102505248		
Sample Rec. Date	29-Apr-2016	Condition Production	Sample ID.	LAN1604291139		
Test Location	25791 Commercentre Drive, Lake Forest, CA 92630 USA					
Test Procedure	e Testing Lab					
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.						
The following tests we	ere performed:			111 0700		
Test Description				UL 2703		
Bonding Path Resista	ince l'est			13		
Thermal Cycling 200				17		
Humidity Test				18		
Evaluation Period	3/20/2022 - 06/2	7/2022	Project No.	G104969520		
Due to the previous te	esting performed	under Intertek Report 102505248LAX-0	001 no additional	testing was		
necessary per the ap	plicable requireme	ents of Mounting Systems, Mounting De	evices, Clamping	/Retention		
	Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels [UL 2703:2015					
Ed.1+R:24Mar2021].						
· · ·						
8.1 Signatures						
A representative sam	ple of the product	covered by this report has been evaluated	ated and found to	comply with the		
Completed by:	Franco Ortega	Reviewed by:	Abhinav Prakasl	n		

Completed by:	Franco Ortega	Reviewed by:	Abhinav Prakash
Title:	PV Engineer	Title:	Reviewer
Signature:	F. Gitega	Signature:	Ala

## 9.0 Correlation Page For Multiple Listings

The following products, which are identical to those identified in this report except for model number and Listee name, are authorized to bear the ETL label under provisions of the Intertek Multiple Listing Program.

BASIC LISTEE	The Hollaender Manufacturing Co.
	10285 Wayne Avenue Cincinnati OH 45215
Country	USA
Product	PV Bonding Devices

MULTIPLE LISTEE 1	None			
Address				
Country				
Brand Name				
ASSOCIATED				
MANUFACTURER				
Address				
Country				
MULTIPLE LISTEE 1 MODELS		BASIC LISTEE MODELS		

MULTIPLE LISTEE 2	None				
Address					
Country					
Brand Name					
ASSOCIATED					
MANUFACTURER					
Address					
Country					
MULTIPLE LISTEE 2 MODELS		BASIC LISTEE MODELS			

MULTIPLE LISTEE 3	None				
Address					
Country					
Brand Name					
ASSOCIATED					
MANUFACTURER					
Address					
Country					
MULTIPLE LISTEE 3 MODELS		BASIC LISTEE MODELS			

#### **10.0 General Information**

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the requirements of this Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate parts, components or materials.

#### **COMPONENTS**

Components used shall be those itemized in this Intertek report covering the product, including any amendments and/or revisions.

#### LISTING MARK

The ETL Listing mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the mark is subject to the control of Intertek.

The mark must include the following four items:

1) applicable country identifiers "US" and/or "C" or "US", "C" and "EU"

- 2) the word "Listed" or "Classified" or "Recognized Component" (whichever is appropriate)
- 3) a control number issued by Intertek

4) a product descriptor that identifies the standards used for certification. Example:

**For US standards**, the words, "Conforms to" shall appear with the standard number along with the word, "Standard" or "Std." Example: "Conforms to ANSI/UL Std. XX."

**For Canadian standards**, the words "Certified to CAN/CSA Standard CXX No. XX." shall be used, or abbreviated, "Cert. to CAN/CSA Std. CXX No. XX."

Can be used together when both standards are used.

**If all standards on the ATM have the same standard title**, the shared title or its abbreviation may be used in place of the examples above. Example: "Medical Electrical Equipment" or "MEE"; "Information Technology Equipment" or "ITE"; "Audio/Video Information And Communication Technology Equipment" or "A/V ICTE".

Note: A facsimile must be submitted to Intertek, Attn: Follow-up Services for approval prior to use. The facsimile need not have a control number. A control number will be issued after signed Certification Agreements have been received by the Follow-up Services office, approval of the facsimile of your proposed Listing Mark, satisfactory completion of the Listing Report, and scheduling of a factory assessment in your facility.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

#### FOLLOW-UP SERVICE

Periodic unannounced audits of the manufacturing facility (and any locations authorized to apply the mark) shall be scheduled by Intertek. An audit report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.

2. Conformance of the use of the ETL mark with the requirements of this Report and the Certification Agreement.

- 3. Manufacturing changes.
- 4. Performance of specified Manufacturing and Production Tests.

In the event that the Intertek representative identifies non-conformance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

- 1. Correct the non-conformance.
- 2. Remove the ETL Mark from non-conforming product.
- 3. Contact the issuing product safety evaluation center for instructions.

#### **10.1 Evaluation of Unlisted Components**

Because Unlisted Components are uncontrolled, and they do not fall under a third party follow up program, Intertek may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process. The Unlisted Components in Section 5.0 require testing and/or evaluation as indicated.

The Applicant will be notified, in writing, via the applicable contact methods, as defined in Section 1.0, when these components must be selected and sent to Component Evaluation Center (CEC) for reevaluation.

Due to particular testing requirements, some components may be requested to be shipped to specific labs. Thus, specific shipment destination(s) for each sample will be provided in the written notification.

Managing CEC Location: Intertek Testing Services NA Inc. ETL Component Evaluation Center 1717 Arlingate Ln. Columbus, Ohio 43228 USA Attn: CEC Safety Sample Disposition: Due to the destructive nature of the testing, all samples will be discarded at the conclusion of testing unless, the manufacturer specifically requests the return of the samples. The request for return must accompany the initial component shipment.

## **11.0 Manufacturing and Production Tests**

The manufacturer agrees to conduct the following Manufacturing and Production Tests as specified:

Required Tests None

12.0 Revision Summary							
The following changes are in compliance with the declaration of Section 8.1:							
Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change			
27-Jun-2022	-2022 1 F. Ortega Astronomics 1		-	Updated Standard from "UL2703 - Standard for Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels. First Edition: January 28, 2015." to "Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels [UL 2703:2015 Ed.1+R:24Mar2021]"			
G104969520LAX		1		Updated Applicant Contact from "Ron Crebo" to "Todd Zureick, Mike Hall" Updated Applicant Phone Number from "(513) 772-8800 ext. 131" to "513/772-8800 x160, 513/772-8800 x186" Updated Applicant Email from "ronc@hollaender.com" to "toddz@hollaender.com, mikeh@hollaender.com" Updated Manufacturer 1 Contact from "Dan Halcomb" to "Todd Zureick, Mike Hall" Updated Applicant Phone Number from "(513) 772-8800 ext. 185" to "513/772-8800 x160, 513/772-8800 x186" Updated Applicant Email from "danh@hollaender.com" to "toddz@hollaender.com, mikeh@hollaender.com"			
		2	-	Updated Model Similarity from "19 indicates cross adjustable brace fitting (See Illustration XXX)" to "19 indicates cross adjustable brace fitting (See Illustration 12)"			
		7	8 9	Updated Illustration 8 - Installation Instructions Page 1 Updated Illustration 9 - Installation Instructions Page 2			
		8	-	Added evaluation period 3/20/2022 - 06/27/2022			