




Constructional Data Form for Photovoltaic Modules

Geshi Licence holder (full address)	Sany Silicon Energy (Zhuzhou) Co., Ltd. Room 518-50, Building 1, Longxin International, No.255, Tongxia Road, Tongtangwan Street, Shifeng District, Zhuzhou City, Hunan Province, P.R. China				
Production factory (full address)	Sany Silicon Energy (Zhuzhou) Co., Ltd. Sany Energy Equipment Industrial Park, No.320 Qingshui Road, Shifeng District, Zhuzhou City, Hunan Province 412005 P.R. China				
Type of product	Photovoltaic (PV) modules				
Trademark					
Type name or model no.	SYM156TBDxxx xxx = 615-635 in steps of 5	SYM144TBDxxx xxx = 555-585 in steps of 5	SYM120TBDxxx xxx = 455-485 in steps of 5	SYM108TBDxxx xxx = 415-440 in steps of 5	SYM144R01TBD xxx xxx = 590-620 in steps of 5
Nominal maximum output power at STC [W]	615, 620, 625, 630, 635	555, 560, 565, 570, 575, 580, 585	455, 460, 465, 470, 475, 480, 485	415, 420, 425, 430, 435, 440	590, 595, 600, 605, 610, 615, 620
Nominal short-circuit current at STC [A]	13.72, 13.78, 13.84, 13.90, 13.96	13.60, 13.66, 13.72, 13.78, 13.84, 13.90, 13.96	13.54, 13.60, 13.66, 13.72, 13.78, 13.84, 13.90	13.60, 13.66, 13.72, 13.78, 13.84, 13.90	14.44, 14.50, 14.56, 14.62, 14.68, 14.74, 14.80
Nominal open-circuit voltage at STC [V]	55.53, 55.67, 55.81, 55.95, 56.09	50.98, 51.12, 51.26, 51.40, 51.54, 51.68, 51.82	42.27, 42.41, 42.55, 42.69, 42.83, 42.97, 43.11	37.94, 38.14, 38.34, 38.54, 38.74, 38.94	51.20, 51.34, 51.48, 51.62, 51.76, 51.90, 52.04
Tolerance of rating at STC (Pmpp / Isc / Voc) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3
Nominal maximum output power at BNPI [W]	677, 682, 688, 693, 699	611, 616, 622, 627, 633, 638, 644	501, 506, 512, 517, 523, 528, 534	457, 462, 468, 473, 479, 484	649, 655, 660, 666, 671, 677, 682
Nominal short-circuit current at BNPI [A]	15.09, 15.16, 15.22, 15.29, 15.36	14.96, 15.03, 15.09, 15.16, 15.22, 15.29, 15.36	14.89, 14.96, 15.03, 15.09, 15.16, 15.22, 15.29	14.96, 15.03, 15.09, 15.16, 15.22, 15.29	15.88, 15.95, 16.02, 16.08, 16.15, 16.21, 16.28
Nominal open-circuit voltage at BNPI [V]	55.53, 55.67, 55.81, 55.95, 56.09	50.98, 51.12, 51.26, 51.40, 51.54, 51.68, 51.82	42.27, 42.41, 42.55, 42.69, 42.83, 42.97, 43.11	37.94, 38.14, 38.34, 38.54, 38.74, 38.94	51.20, 51.34, 51.48, 51.62, 51.76, 51.90, 52.04
Tolerance of rating at BNPI (Pmpp / Isc / Voc) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3
Bifaciality coefficient	80%±5%	80%±5%	80%±5%	80%±5%	80%±5%
Dimensions (L x W x H) [mm]	2465x1134x30	2278x1134x30	1903*1134*30	1722*1134*30	2382x1134x30
Module area [m²]	2.80	2.58	2.16	1.95	2.70
Class (IEC 61730-1:2016)	II	II	II	II	II
Maximum system voltage [V_{DC}]	1500	1500	1500	1500	1500
Pollution degree	I	I	I	I	I
Qualified as cemented joint design	No	No	No	No	No

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Over-current protection rating [A]	30	30	30	30	30
Defined min. creepage distance [mm]	12.3±1	12.3±1	12.3±1	12.3±1	12.3±1
Defined min. clearance distance [mm]	12.3±1	12.3±1	12.3±1	12.3±1	12.3±1
Max. operational altitude [masl]	2000	2000	2000	2000	2000
Design load – downwards [Pa]	3600	3600	3600	3600	3600
Design load – upwards [Pa]	1600	1600	1600	1600	1600
Safety factor for mechanical load	1.5	1.5	1.5	1.5	1.5
Number of solar cells	156	144	120	108	144
Connection of cells (S, SP, PS)	SPS	SPS	SPS	SPS	SPS
Number of diodes	3	3	3	3	3
Cells per diode	52	48	40	36	48
Type name or model no.	SYMN120R01TB Dxxx xxx = 490-520 in steps of 5	SYMN108R01TB Dxxx xxx = 440-470 in steps of 5	SYMN108TBDBx xx xxx = 415-440 in steps of 5	SYMN156R02TB Dxxx xxx = 655-675 in steps of 5	—
Nominal maximum output power at STC [W]	490, 495, 500, 505, 510, 515, 520	440, 445, 450, 455, 460, 465, 470	415, 420, 425, 430, 435, 440	655, 660, 665, 670, 675	—
Nominal short-circuit current at STC [A]	14.44, 14.50, 14.56, 14.62, 14.68, 14.74, 14.80	14.44, 14.50, 14.56, 14.62, 14.68, 14.74, 14.80	13.37, 13.43, 13.49, 13.55, 13.61, 13.67	14.62, 14.68, 14.74, 14.80, 14.86	—
Nominal open-circuit voltage at STC [V]	42.62, 42.76, 42.90, 43.04, 43.18, 43.32, 43.46	38.33, 38.47, 38.61, 38.75, 38.89, 39.03, 39.17	38.74, 38.94, 39.14, 39.34, 39.54, 39.74	55.91, 56.05, 56.19, 56.33, 58.12	—
Tolerance of rating at STC (Pmpp / Isc / Voc) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	—
Nominal maximum output power at BNPI [W]	539, 545, 550, 556, 561, 567, 572	484, 490, 495, 501, 506, 512, 517	457, 462, 468, 473, 479, 484	721, 726, 732, 737, 743	—
Nominal short-circuit current at BNPI [A]	15.88, 15.95, 16.02, 16.08, 16.15, 16.21, 16.28	15.88, 15.95, 16.02, 16.08, 16.15, 16.21, 16.28	14.71, 14.77, 14.84, 14.91, 14.97, 15.04	16.08, 16.15, 16.21, 16.28, 16.35	—
Nominal open-circuit voltage at BNPI [V]	42.62, 42.76, 42.90, 43.04, 43.18, 43.32, 43.46	38.33, 38.47, 38.61, 38.75, 38.89, 39.03, 39.17	38.74, 38.94, 39.14, 39.34, 39.54, 39.74	55.91, 56.05, 56.19, 56.33, 58.12	—
Tolerance of rating at BNPI (Pmpp / Isc / Voc) [%]	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	± 3/ ± 3/ ± 3	—
Bifaciality coefficient	80%±5%	80%±5%	80%±5%	80%±5%	—
Dimensions (L x W x H) [mm]	1994x1134x30	1800x1134x30	1722*1134*30	2465x1192x33/30	—

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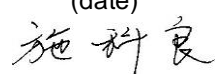
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Module area [m ²]	2.20	2.04	1.95	2.94	—
Class (IEC 61730-1:2016)	II	II	II	II	—
Maximum system voltage [V _{DC}]	1500	1500	1500	1500	—
Pollution degree	I	I	I	I	—
Qualified as cemented joint design	No	No	No	No	—
Over-current protection rating [A]	30	30	30	30	—
Defined min. creepage distance [mm]	12.3±1	12.3±1	12.3±1	12.3±1	—
Defined min. clearance distance [mm]	12.3±1	12.3±1	12.3±1	12.3±1	—
Max. operational altitude [masl]	2000	2000	2000	2000	—
Design load – downwards [Pa]	3600	3600	3600	3600	—
Design load – upwards [Pa]	1600	1600	1600	1600	—
Safety factor for mechanical load	1.5	1.5	1.5	1.5	—
Number of solar cells	120	108	108	156	—
Connection of cells (S, SP, PS)	SPS	SPS	SPS	SPS	—
Number of diodes	3	3	3	3	—
Cells per diode	40	36	36	52	—

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PV MODULE

Sany Silicon Energy (Zhuzhou) Co., LTD
Sany Energy Equipment Industrial Park,
No.320 Qingshui Road, Shifeng District
Zhuzhou City, Hunan Province 412005
China
<https://www.sanyglobal.com/product/>

SYM156TBD 615
Test conditions
Max. power (P_{max})
Max. power tolerance
Voltage at max. power (V_{mp})
Current at max. power (I_{mp})
Open-circuit voltage (V_{oc})
Short-circuit current (I_{sc})
The following coefficients measured at STC according to IEC TS 60041-1-2, Bifaciality:
g_{Pmax}80%±5%, g_{Lsc}80%±5%, g_{Voc}99%±1%

STC	BNPI	BSI
615W	677W	
+3%		
42.80V		
13.14A		
55.53V±3%	55.53V±3%	
13.72A±3%	15.09±3%	16.46±3%

Module (T₈₅) max (°C)
Design Load (Pa)
Series Fuse Rating
Maximum system voltage
operating temperature range
protect rage
module wprocted height
module size
STC
BNPI
Connector

70	34.3(kg)	2485×1134×30(mm)	1000W/m ² , AM1.5, 25°C
+3800/1800			front 1000W/m ² , rear 135W/m ²
30A			Refer to manual
1500VDC			
40°C ~ +85°C			
II			



warning

Only the professionals can install and maintain the components. Be careful of the dangerous high DC voltage when connecting the components. Never damage or scratch the back of the assembly.
Certified in accordance with IEC 61215:2021 and IEC 61730:2016
MADE IN CHINA

Marking plate is in compliance with IEC 61215:2021 and IEC 61730:2016.

Shanghai
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List of critical components (add lines for multiple material sources)

Object	Manufacturer	Type / model	Technical data / ratings	Standard (if applicable)	Certificates (if applicable)
Solar cell 1	Sany Silicon Energy (Zhuzhou) Co., Ltd.	SYCN182T16 (combined with Encapsulation material 1,2,3)	L x W x T [mm]: 182.2 x 91 (±0.25) x 0.13 (±0.015) 182.2 x 91.875 (±0.25) x 0.13 (±0.015) Topcon Mono-Si, 16BB	—	—
Solar cell 2	Sany Silicon Energy (Zhuzhou) Co., Ltd.	SYCN18AT16 (combined with Encapsulation material 1,2,3)	L x W x T [mm]: 182.2 x 95.8 (±0.25) x 0.13 (±0.015) 191.6 x 91.1 (±0.25) x 0.13 (±0.015) Topcon Mono-Si, 16BB	—	—
Front cover 1	Hunan KibingSolar Technology Co., Ltd.	Semi-tempered AR coated glass	Thickness [mm]: =2.0±0.2mm	—	—
Front cover 2	CSG HOLDING CO., LTD.	Semi-tempered AR coated glass	Thickness [mm]: =2.0±0.2mm	—	—
Front cover 3	Changzhou Almaden Co., Ltd.	Semi-tempered AR coated glass	Thickness [mm]: =1.6±0.16mm	—	—
Backside cover 1	Hunan KibingSolar Technology Co., Ltd.	Semi-Tempered back glass	Thickness [mm]: =2.0±0.2mm	—	—
Backside cover 2	CSG HOLDING CO., LTD.	Semi-Tempered back glass	Thickness [mm]: =2.0±0.2mm	—	—
Backside cover 3	Changzhou Almaden Co., Ltd.	Semi-Tempered back glass	Thickness [mm]: =1.6±0.16mm Color: black glaze or transparent	—	—
Cell connectors 1	Suzhou bonide Photovoltaic Technology Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm	—	—
Cell connectors 2	Jiangsu Xingdarui Optical Power Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm	—	—
Cell connectors 3	Changzhou Shengyue metal new material Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm	—	—
Cell connectors 4	Suzhou YourBest new-type materials Co., Ltd	Sn60Pb40	Dimensions [mm]: Ø= 0.26±0.026mm	—	—
String connectors 1	Suzhou bonide Photovoltaic Technology Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm	—	—
String connectors 2	Jiangsu Xingdarui Optical Power Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm	—	—

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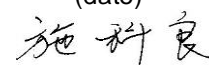
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String connectors 3	Changzhou Shengyue metal new material Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm		
String connectors 4	Suzhou YourBest new-type materials Co., Ltd	Sn60Pb40	Dimensions [mm]: 0.3±0.03mm x 6.0±0.6mm 0.3±0.03mm x 4.0±0.4mm		
Soldering material	—	—	—	—	—
Light redirecting film (on the internal rear cover)	Wuxi Heyu Renewable Technology Co., Ltd	BC81	Thickness =125±20um	—	—
Fluxing agent 1	Shenzhen Tongfang Electronic New-Material CO., LTD	AATF9800-MBB	—	—	—
Fluxing agent 2	ASAHI SOLDER TECHNOLOGY(WUXI) CO., LTD	SF180	—	—	—
Fluxing agent 3	Zhuhai Changxian New Materials Technology Co., Ltd.	CX700	—	—	—
Cell fixing tape 1	SuZhou Rongzhi Electronic Technology Co., Ltd	D60F6-2	Thickness =100±40um	—	—
Cell fixing tape 2	Guangdong Sunrui New Material Co., Ltd	HZ UV-100	Thickness =100±40um	—	—
Cell fixing tape 3	SuZhou Rongzhi Electronic Technology Co., Ltd	D60F6-6	Thickness =100±40um	—	—
Cell fixing tape 4	Guangdong Sunrui New Material Co., Ltd	HZ UV-3	Thickness =100±40um	—	—
Encapsulation material 1	HANGZHOU FIRST APPLIED MATERIAL CO., LTD	EP304 (above cells)	Thickness = 0.5mm±10% gram weight: 380g/m ² ±10%	—	—
		F460PS (below cells)	Thickness = 0.5mm±10% gram weight: 400g/m ² ±10%		
Encapsulation material 2	CHANGZHOU BETTERIAL FILM TECHNOLOGIES CO., LTD	B602M (above cells)	Thickness = 0.5mm±10% gram weight: 380g/m ² ±10%	—	—
		B601HP (below cells)	Thickness = 0.5mm±10% gram weight: 400g/m ² ±10%		
Encapsulation material 3	Kunshan Tianyang New Materials Co., Ltd.	JCC-105P-T (above cells)	Thickness = 0.45mm±10% gram weight: 410g/m ² ±10%	—	—
		JCC-105P-T (below cells)	Thickness = 0.45mm±10% gram weight: 410g/m ² ±10%		
Frame parts 1	Jiangyin Chaoyang Photovoltaic Co., Ltd.	Anodized Aluminium Alloy 6005-T6 (Silver)	H(mm) x W(mm): 30x30mm (long frame) 30x15mm (short frame)	—	—
Frame parts 2	CHANGSHU DONGNENG SOLAR TECHNOLOGY CO., LTD	Anodized Aluminium Alloy 6005-T6 (Silver or black)	H(mm) x W(mm): 30x30mm (long frame)		

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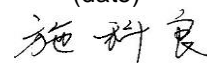
			30x15mm (short frame)		
Adhesive (frame)1	H.B.Fuller (Suzhou) Advanced Material Co., Ltd.	1527	Color: White or black	—	—
Adhesive (frame)2	Jiangsu Tianchen New Materials CO., LTD	HT-8258	Color: White	—	—

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Junction box set 1					
Junction box 1	Zerun Co., Ltd.	Z8-CBPO	Rated. Voltage = 1500V Rated. Current = 25A Reverse current: 47.5A IP68	IEC 62790: 2020 EN IEC 62790: 2020	R 50537484
Cable	Zerun Co., Ltd.	62930 IEC 131 1 x 2,5mm ² / 1 x 4,0mm ² / 1 x 6,0mm ²	Max. Voltage = 1500VDC	IEC 62930	R 50354353
Connector	Zerun Co., Ltd.	Z4S-abcd	Rated. Voltage = 1500V Rated. Current = 41A	IEC 62852:2014	R 50556260
Bypass diode	Zerun Co., Ltd.	35SQ045	Tj max = 200°C	—	—
Adhesive	H.B.Fuller (Suzhou) Advanced Material Co., Ltd.	1527	Color: White or black	—	—
Potting (junction box)	H.B.Fuller (Suzhou) Advanced Material Co., Ltd.	1533	Color: White or black	—	—
Junction box set 2					
Junction box 2	Suzhou Xtong Photovoltaic Technologies Co., Ltd.	PV-XT1609Nxyz (x=4; y=3; z=1 or 2)	Rated. Voltage = 1500V Rated. Current = 25A Reverse current: 40A IP68	IEC 62790: 2020 EN IEC 62790: 2020	R 50524457
Cable	Suzhou Xtong Photovoltaic Technologies Co., Ltd.	62930 IEC 131 1 x 2,5mm ² / 1 x 4,0mm ² / 1 x 6,0mm ² HALOGEN FREE LOW SMOKE	Max. Voltage = 1500VDC	IEC 62930	R 50453577
Connector	Suzhou Xtong Photovoltaic Technologies Co., Ltd.	PV-XT101.2	Rated. Voltage = 1500V Rated. Current = 41A	IEC 62852:2014	R 50568733
Bypass diode	Suzhou Xtong Photovoltaic Technologies Co., Ltd.	XT4050M-B	Tj max = 200°C	—	—
Adhesive	H.B.Fuller (Suzhou) Advanced Material Co., Ltd.	1527	Color: White or black	—	—
Potting (junction box)	H.B.Fuller (Suzhou) Advanced Material Co., Ltd.	1533	Color: White or black	—	—

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Junction box set 3					
Junction box 3	QC Solar (Suzhou) Corporation	3Qxy (x=1 or 2 or 3 or 4; y=1 or 2 or 3 or 4)	Rated voltage =1500VDC Rated current =20A (x=1; y=1 or 2 or 3 or 4) Rated current =22A (x=2; y=1 or 2 or 3) Rated current =25A (x=3; y=1 or 2 or 3 or 4) Rated current =30A (x=4; y=1 or 2 or 3 or 4) Reverse current=40A IP68	IEC 62790: 2020 EN IEC 62790: 2020	R 50510013
Cable	QC Solar (Suzhou) Corporation	62930 IEC 131 1 x 2,5mm ² / 1 x 4,0mm ² / 1 x 6,0mm ² / 1 x 10,0mm ² HALOGEN FREE LOW SMOKE	Max. Voltage = 1500VDC	IEC 62930	R 50447239
Connector	QC Solar (Suzhou) Corporation	QC4.10-cds	Max. Voltage = 1500VDC Max. Current = 41A	IEC 62852: 2014	R 50505605
Bypass diode	QC Solar (Suzhou) Corporation	QCM4045	Tj max =200 °C;	—	—
Adhesive	Shanghai Huitian New Material Co., Ltd.	HT906Z	Color: White or black	—	—
Potting (junction box)	Shanghai Huitian New Material Co., Ltd.	5299W-S	Color: White or black	—	—
Junction box set 4					
Junction box 4	ZHEJIANG FORSOL ENERGY CO., LTD	F303x Plus	Rated voltage =1500VDC 20A for F303x Plus (x=D); 25A for F303x Plus (x=F); 30A for F303x Plus (x=G) Reverse current=40A IP68	IEC 62790: 2020 EN IEC 62790: 2020	R 50603479
Cable	ZHEJIANG FORSOL ENERGY CO., LTD	62930 IEC 131 1 x 1,5 ... 6mm ² HALOGEN FREE LOW SMOKE	Max. Voltage = 1500VDC	IEC 62930	R 50515986
Connectors	ZHEJIANG FORSOL ENERGY CO., LTD	FC4	Max. Voltage = 1500VDC Max. Current = 41A	IEC 62852: 2014	R 50513372
Bypass diode	ZHEJIANG FORSOL ENERGY CO., LTD	FSL-4050	Tj max =200 °C;	—	—
Adhesive (junction box) 1	Guangzhou Jointas Chemical Co., Ltd.	179W	Color: White or black	—	—
Adhesive (junction box) 2	Hubei Ruijia Silicon Materials Co., Ltd.	GS PV589	Color: White or black	—	—



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Potting material 1	Guangzhou Jointas Chemical Co., Ltd.	162 A/B	Color: White or black	—	—
Potting material 2	Hubei Ruijia Silicon Materials Co., Ltd.	GS PV586 A/B	Color: White or black	—	—
Junction box set 5					
Junction box 5	Changshu Friends connector Technology CO.,LTD	F20-01 X	Rated voltage =1500VDC 25A for F20-01 X (x=003a); 30A for F20-01 X (x=003b) Reverse current=41A IP68	IEC 62790: 2020 EN IEC 62790: 2020	R 50576603
Cable	Changshu Friends connector Technology CO., LTD	62930 IEC 131 1 x 1,5 ... 35mm2 HALOGEN FREE LOW SMOKE	Max. Voltage = 1500VDC	IEC 62930	R 50538772
Connectors	Changshu Friends connector Technology CO., LTD	PV5e	Max. Voltage = 1500VDC Rated Current = 35A	IEC 62852: 2014	R 50525017
Bypass diode	Changshu Friends connector Technology CO., LTD	30SQ045	Tj max =200 °C;		
Adhesive (junction box) 1	Jiangsu Tianchen New Materials CO., LTD	HT-8258	Color: White or black	—	—
Adhesive (junction box) 2	Guangzhou Jointas Chemical Co., Ltd.	179W	Color: White or black	—	—
Potting material 1	Jiangsu Tianchen New Materials CO., LTD	HT-6360 A/B	Color: White or black	—	—
Potting material 2	Guangzhou Jointas Chemical Co., Ltd.	162 A/B	Color: White or black	—	—

Mounting and attachment parts	—	—	—	—	—
Additional materials	—	—	—	—	—
(Optional) Accessories	—	—	—	—	—
Remarks	For construction, framed or frameless, with Junction box, cable and connector. For extension qualifications, new materials introduced shall be highlighted in bold. Substituted materials shall still be listed.				

Shanghai (Place) 30/06/2024 (date)  (stamp and/or signature of TÜV Rheinland)	 Changzhou (Place) 30/06/2024 (date) 施科良 (stamp and/or signature of applicant)
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Note: Any errors or omissions in the CDF shall be reported to TÜV Rheinland immediately upon receipt by the applicant.