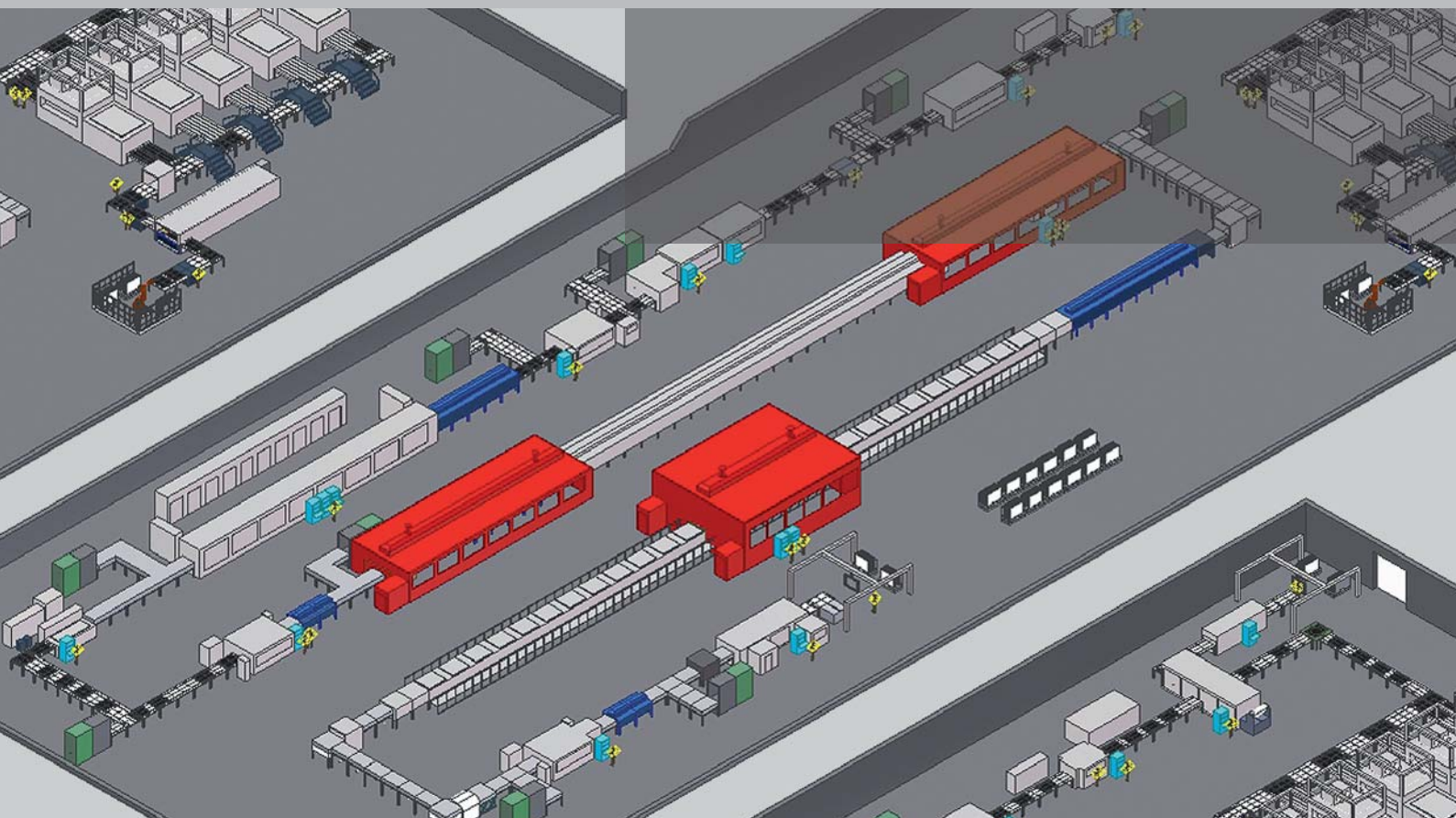
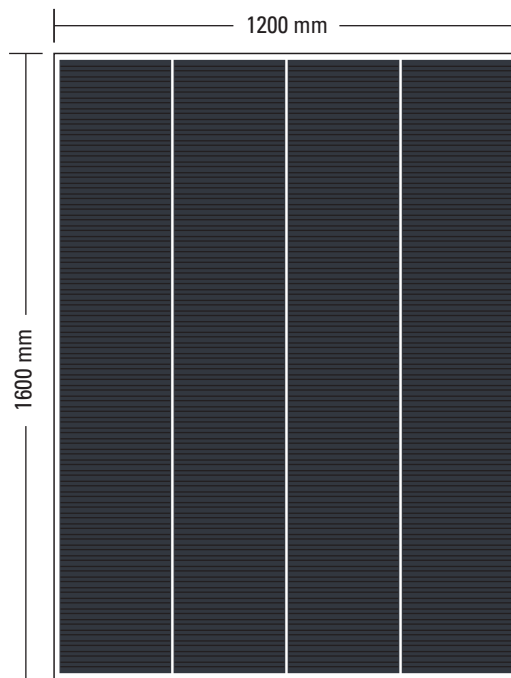


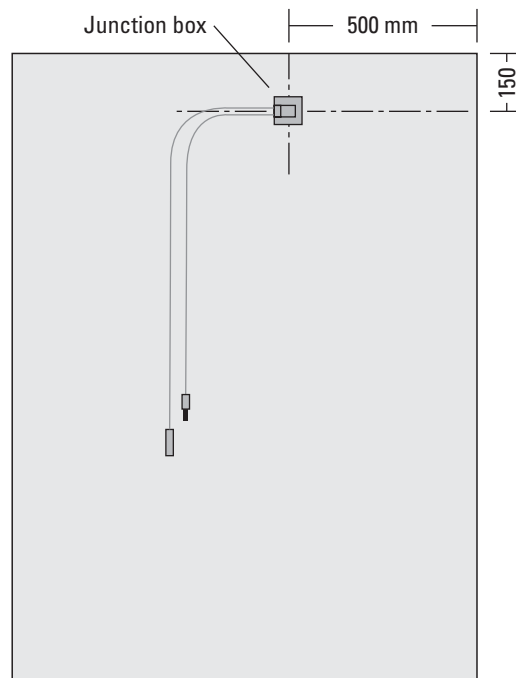
Solar Module 190 W

Turnkey Solutions
for CdTe-Solar-Module
Manufacturing





Front side



Back side

Data Sheet

ROTH & RAU

CTF Technology

Roth & Rau AG
 An der Baumschule 6-8
 09337 Hohenstein-Ernstthal
 Germany
 Phone +49 (0) 3723 - 66 85 - 0
 Fax +49 (0) 3723 - 66 85 - 100
 E-mail info@roth-rau.de
 www.roth-rau.de

Roth & Rau
 CTF Solar GmbH
 Industriestraße 2-4
 65779 Kelkheim/Taunus
 Germany
 Phone +49 (0) 6195-6763-10
 Fax +49 (0) 6195-6763-19
 www.ctf-solar.com

Nominal Power	P_{MPP} 190 W	
Number of Cells in Serial Connection	155	
Type of Cell	CdTe thin-film	
Nominal Current	I_{MPP} A	
Nominal Voltage	V_{MPP} 90 V	
Short Circuit Current	I_{SC} 2.39 A	
Open Circuit Voltage	U_{OC} 121 V	
Max. Allowable Voltage	1,000 V	
Temperature Coefficient	$TK(P_{MPP})$	< -0.3 % / °C
Temperature Coefficient	$TK(U_{OC})$	< -0.3 % / °C
Temperature Coefficient	$TK(I_{SC})$	< -0.2 % / °C
Operating Temperature	- 40 to + 85 °C	
Length	1,600 mm	
Width	1,200 mm	
Thickness	7.0 mm	
Thickness Including Junction Box	9.6 mm	
Weight	32 kg	
Module Set Up	glass – lamination foil – glass	
Front Side	glass, 3.2 mm	
Frame	frameless	
Certificates	IEC 61646 (in preparation) Safety Class II (in preparation)	
Warranty	25 year power output warranty: - first 10 years 90 %, - following 15 years 80 % of nominal power output	