

SOLIDWORKS®

SOLIDWORKS CAM Standard Essentials

Dassault Systèmes SolidWorks Corporation
175 Wyman Street
Waltham, MA 02451 U.S.A.

© 1995-2017, Dassault Systemes SolidWorks Corporation, a Dassault Systèmes SE company, 175 Wyman Street, Waltham, Mass. 02451 USA. All Rights Reserved.

The information and the software discussed in this document are subject to change without notice and are not commitments by Dassault Systemes SolidWorks Corporation (DS SolidWorks).

No material may be reproduced or transmitted in any form or by any means, electronically or manually, for any purpose without the express written permission of DS SolidWorks.

The software discussed in this document is furnished under a license and may be used or copied only in accordance with the terms of the license. All warranties given by DS SolidWorks as to the software and documentation are set forth in the license agreement, and nothing stated in, or implied by, this document or its contents shall be considered or deemed a modification or amendment of any terms, including warranties, in the license agreement.

Patent Notices

SOLIDWORKS® 3D mechanical CAD and/or Simulation software is protected by U.S. Patents 6,611,725; 6,844,877; 6,898,560; 6,906,712; 7,079,990; 7,477,262; 7,558,705; 7,571,079; 7,590,497; 7,643,027; 7,672,822; 7,688,318; 7,694,238; 7,853,940; 8,305,376; 8,581,902; 8,817,028; 8,910,078; 9,129,083; 9,153,072; 9,262,863; 9,465,894; 9,646,412 and foreign patents, (e.g., EP 1,116,190 B1 and JP 3,517,643).

eDrawings® software is protected by U.S. Patent 7,184,044; U.S. Patent 7,502,027; and Canadian Patent 2,318,706.

U.S. and foreign patents pending.

Trademarks and Product Names for SOLIDWORKS Products and Services

SOLIDWORKS, 3D ContentCentral, 3D PartStream.NET, eDrawings, and the eDrawings logo are registered trademarks and FeatureManager is a jointly owned registered trademark of DS SolidWorks.

CircuitWorks, FloXpress, PhotoView 360, and TolAnalyst are trademarks of DS SolidWorks.

FeatureWorks is a registered trademark of HCL Technologies Ltd.

SOLIDWORKS 2018, SOLIDWORKS Standard, SOLIDWORKS Professional, SOLIDWORKS Premium, SOLIDWORKS PDM Professional, SOLIDWORKS PDM Standard, SOLIDWORKS Simulation Standard, SOLIDWORKS Simulation Professional, SOLIDWORKS Simulation Premium, SOLIDWORKS Flow Simulation, eDrawings Viewer, eDrawings Professional, SOLIDWORKS Sustainability, SOLIDWORKS Plastics, SOLIDWORKS Electrical Schematic Standard, SOLIDWORKS Electrical Schematic Professional, SOLIDWORKS Electrical 3D, SOLIDWORKS Electrical Professional, CircuitWorks, SOLIDWORKS Composer, SOLIDWORKS Inspection, SOLIDWORKS MBD, SOLIDWORKS PCB powered by Altium, SOLIDWORKS PCB Connector powered by Altium, and SOLIDWORKS Visualization are product names of DS SolidWorks.

Other brand or product names are trademarks or registered trademarks of their respective holders.

COMMERCIAL COMPUTER SOFTWARE - PROPRIETARY

The Software is a "commercial item" as that term is defined at 48 C.F.R. 2.101 (OCT 1995), consisting of "commercial computer software" and "commercial software documentation" as such terms are used in 48 C.F.R. 12.212 (SEPT 1995) and is provided to the U.S. Government (a) for acquisition by or on behalf of civilian agencies, consistent with the policy set forth in 48 C.F.R. 12.212; or (b) for acquisition by or on behalf of units of the Department of Defense, consistent with the policies set forth in 48 C.F.R. 227.7202-1 (JUN 1995) and 227.7202-4 (JUN 1995)

In the event that you receive a request from any agency of the U.S. Government to provide Software with rights beyond those set forth above, you will notify DS SolidWorks of the scope of the request and DS SolidWorks will have five (5) business days to, in its sole discretion, accept or reject such request. Contractor/Manufacturer: Dassault Systemes SolidWorks Corporation, 175 Wyman Street, Waltham, Massachusetts 02451 USA.

Copyright Notices for SOLIDWORKS Standard, Premium, Professional, and Education Products

Portions of this software © 1986-2017 Siemens Product Lifecycle Management Software Inc. All rights reserved.

This work contains the following software owned by Siemens Industry Software Limited:

D-Cubed® 2D DCM © 2017. Siemens Industry Software Limited. All Rights Reserved.

D-Cubed® 3D DCM © 2017. Siemens Industry Software Limited. All Rights Reserved.

D-Cubed® PGM © 2017. Siemens Industry Software Limited. All Rights Reserved.

D-Cubed® CDM © 2017. Siemens Industry Software Limited. All Rights Reserved.

D-Cubed® AEM © 2017. Siemens Industry Software Limited. All Rights Reserved.

Portions of this software © 1998-2017 HCL Technologies Ltd.

Portions of this software incorporate PhysX™ by NVIDIA 2006-2010.

Portions of this software © 2001-2017 Luxology, LLC. All rights reserved, patents pending.

Portions of this software © 2007-2017 DriveWorks Ltd.

© 2011, Microsoft Corporation. All rights reserved.

Includes Adobe® PDF Library technology

Copyright 1984-2016 Adobe Systems Inc. and its licensors. All rights reserved. Protected by U.S. Patents.5,929,866; 5,943,063; 6,289,364; 6,563,502; 6,639,593; 6,754,382; Patents Pending.

Adobe, the Adobe logo, Acrobat, the Adobe PDF logo, Distiller and Reader are registered trademarks or trademarks of Adobe Systems Inc. in the U.S. and other countries.

For more DS SolidWorks copyright information, see Help > About SOLIDWORKS.

Copyright Notices for SOLIDWORKS Simulation Products

Portions of this software © 2008 Solversoft Corporation.

PCGLSS © 1992-2017 Computational Applications and System Integration, Inc. All rights reserved.

Copyright Notices for SOLIDWORKS PDM Professional Product

Outside In® Viewer Technology, © 1992-2012 Oracle

© 2011, Microsoft Corporation. All rights reserved.

Copyright Notices for eDrawings Products

Portions of this software © 2000-2014 Tech Soft 3D.

Portions of this software © 1995-1998 Jean-Loup Gailly and Mark Adler.

Portions of this software © 1998-2001 3Dconnexion.

Portions of this software © 1998-2014 Open Design Alliance. All rights reserved.

Portions of this software © 1995-2012 Spatial Corporation.

The eDrawings® for Windows® software is based in part on the work of the Independent JPEG Group.

Portions of eDrawings® for iPad® copyright © 1996-1999 Silicon Graphics Systems, Inc.

Portions of eDrawings® for iPad® copyright © 2003 - 2005 Apple Computer Inc.

Copyright Notices for SOLIDWORKS PCB Products

Portions of this software © 2017 Altium Limited.

Document Number: PMT1865-ENG

Contents

Introduction

About This Course	2
Prerequisites	2
Course Design Philosophy	2
Using this Book	2
About the Training Files	3
Conventions Used in this Book	4
Windows 10	5
Use of Color	5
Graphics and Graphics Cards	5
More SOLIDWORKS Training Resources	6
Local User Groups	6

Lesson 1:

SOLIDWORKS CAM Basics and User Interface

What is SOLIDWORKS CAM?	8
SOLIDWORKS CAM Add-in	9
SOLIDWORKS CAM User Interface	10
Process Overview	12
Case Study: Generate Toolpaths and NC Code	13
SOLIDWORKS CAM Feature Tree	14
Exercise 1: Generate Toolpaths and NC Code	33

Lesson 2:**Automatic Feature Recognition and Operation Modification**

Working with Features, Operations and Toolpaths	36
Automatic Feature Recognition	36
Case Study: Working with Features, Operations and Toolpaths.	40
Operation Plans	42
Toolpaths	45
Modifying Operations	48
Modifying Parameters	51
Design Changes	65
Exercise 2: Generate and Modify Toolpaths	67

Lesson 3:**Interactive Feature Recognition (IFR)**

Interactive Feature Creation	72
Case Study: AFR and IFR Feature Creation	72
Part Perimeter Feature	75
2.5 Axis Features	80
Mill Part Setup	86
Case Study: IFR 2.5 Axis Feature and Operation Creation	87
Case Study: IFR 2.5 Axis Feature Selection Filters	98
Exercise 3: Interactive Feature Creation	102

Lesson 4:**Interactive Operations**

Interactive 2.5 Axis Mill Operations	106
Case Study: Interactive Operation Creation	107
Case Study: Create Operations	110
Save Operation Plan	113
Case Study: Save Operation Plan	114
Machining Similar Features	121
Case Study: Combine Operations	123
Adding Avoid and Contain Areas	125
Case Study: Add Avoid Area	126
Exercise 4: Interactive Operations	128
Exercise 5: Link Operations	131
Exercise 6: Avoid Areas	132

Lesson 5:**Pattern Features**

Patterning	134
Case Study: Create Linear, Circular and Sketch Driven Patterns.	137
Exercise 7: Generate and Modify Toolpaths	142

Lesson 6:**Advanced Features and Operations**

Advanced Feature Creation	146
Engrave	146
Case Study: Engrave Feature Creation	146
Multi-stepped Hole	148
Case Study: Multi-stepped Hole Machining	149
Corner Round and Chamfer Machining	156
Case Study: Corner Round and Chamfer Machining	156
User Defined Tool	162
Case Study: User Defined Tool Creation	164
Multi Surface Feature	173
Case Study: Multi Surface Feature Creation	174
Exercise 8: Advances Features and Operations	179
Exercise 9: Multi Surface Machining	184
Exercise 10: User Defined Tool	186

Lesson 7:**Customizing the Technology Database**

SOLIDWORKS CAM Technology Database (TechDB)	192
Mill Machine.	194
Case Study: TechDB Add Machine	196
Mill Tool	200
Case Study: TechDB Add Tool	200
Tool Crib	202
Strategies	205
Case Study: TechDB Create and Apply Strategy	206
Exercise 11: Customize Technology Database	211
Exercise 12: Add Tool to Tool Crib	213

Appendix A:**Considerations for Waterjet, Plasma and Laser Machining**

Waterjet, Plasma and Laser Machining	216
Case Study: Plasma Workflow	217

Appendix B:**Tolerance Based Machining**

Tolerance Based Machining Overview	228
Case Study: Tolerance Based Machining	230