SOLIDWORKS®

Weldments
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; 9,870,436; 10,055,083; 10,073,600; 10,235,493 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.


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 © 1986-2018 Siemens Product Lifecycle Management Software Inc. All rights reserved.

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


Portions of this software © 1998-2019 HCL Technologies Ltd.

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

Portions of this software © 2001-2019 Luxology, LLC. All rights reserved, patents pending.

Portions of this software © 2007-2019 DriveWorks Ltd. © 2012, 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 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 © 2012, 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 © 1998-2017 Open Design Alliance. All rights reserved.

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


**Copyright Notices for SOLIDWORKS PCB Products**

Portions of this software © 2017-2018 Altium Limited.

**Copyright Notices for SOLIDWORKS Visualize Products**

NVIDIA GameWorks™ Technology provided under license from NVIDIA Corporation. Copyright © 2002-2015 NVIDIA Corporation. All rights reserved.

© 1995-2019, Dassault Systemes SolidWorks Corporation, a Dassault Systemes SE company, 175 Wyman Street, Waltham, Mass. 02451 USA. All Rights Reserved.
Contents

Introduction

About This Course ...................................................... 2
Prerequisites ........................................................... 2
Course Design Philosophy ............................................. 2
Using this Book .......................................................... 2
Conventions Used in this Book ................................. 3
About the Training Files ............................................. 3
Training Templates ....................................................... 3
Windows ................................................................. 4
Use of Color .............................................................. 4
Graphics and Graphics Cards ..................................... 5
Color Schemes ........................................................... 5
Finding Commands ....................................................... 6
More SOLIDWORKS Training Resources ..................... 6
Local User Groups ....................................................... 6
# Lesson 1: Weldment Features

Weldments. ................................................................. 8  
Weldment Feature ..................................................... 9  
Weldment Configuration Options ............................... 10  
Structural Members .................................................. 11  
The Default Profiles ............................................... 11  
Weldment Profiles from SOLIDWORKS Content .......... 12  
What is a Structural Member Profile? ......................... 14  
Inserting Structural Member .................................... 17  
Weldment Profiles Folder Structure ......................... 17  
Groups ................................................................. 19  
Corner Treatment Options ..................................... 20  
Individual Corner Treatments ................................. 21  
Profile Position Settings ....................................... 22  
Groups vs. Structural Members ............................... 24  
Trim/Extend Options .............................................. 26  
Sketch Considerations .......................................... 28  
Trim Order .......................................................... 30  
Adding Plates and Holes ......................................... 32  
Gussets and End Caps ........................................... 33  
Gusset Profile and Thickness .................................. 33  
Locating the Gusset .............................................. 33  
End Cap Parameters .............................................. 35  
Using Symmetry ..................................................... 37  
Advantages of a Multibody Part ............................. 38  
Limitations of a Multibody Part ............................ 40  
Exercise 1: Sign Holder .......................................... 41  
Exercise 2: Weld Table ........................................... 46  
Exercise 3: Suspension Frame ............................... 51  
Exercise 4: Evaporator Support ............................. 55

# Lesson 2: Working with Weldments

Managing the Cut List ............................................. 64  
Cut List Item Names ................................................ 65  
Accessing Properties ............................................. 66  
Cut-List Properties Dialog ..................................... 67  
Structural Member Properties ............................... 67  
Adding Cut List Properties ................................... 68  
Bounding Boxes in Weldments ............................... 69  
Editing a Bounding Box ......................................... 69
Options for Generating Cut List Items ........................................... 71
  Manually Managing Cut List Items ........................................... 72
  Creating Sub-weldments ....................................................... 72
  Using Selection Filters ........................................................ 74
Custom Structural Member Profiles .......................................... 75
  Modifying a Profile ............................................................. 75
  Transferred Information from Profiles .................................... 76
Defining Material ........................................................................ 79
Creating Custom Profiles .......................................................... 79
Standard or Configured Profiles .................................................. 81
Inserting Existing Parts ............................................................. 85
  Locate Part and Move/Copy Body ............................................ 87
When to Use an Assembly .......................................................... 89
Exercise 5: Weld Table Cut List .................................................. 90
Exercise 6: Picnic Table ............................................................. 94
Exercise 7: Insert Part ............................................................... 100

Lesson 3:
Configuring and Detailing Weldments

Weldment Configurations ......................................................... 104
  Adding Configurations .......................................................... 104
Post-Assembly Machining Features ........................................... 104
  Feature Scope ....................................................................... 106
Weldment Drawings ............................................................... 107
Drawing Views of Individual Bodies .......................................... 108
  Select Drawing View Bodies .................................................. 108
  Using Display States ............................................................ 110
  Isolate .................................................................................. 110
  Using Relative View ............................................................ 113
  Cut List Tables ..................................................................... 115
Representing Welds ................................................................. 119
  Weld Symbols ...................................................................... 119
  Other Weld Annotations ....................................................... 123
  Fillet Beads ......................................................................... 123
  Weld Bead Feature .............................................................. 126
  Weld Tables ......................................................................... 136
Exercise 8: Detail Picnic Table ..................................................... 138
Exercise 9: Representing Welds .................................................. 143
Lesson 4: Working with Bent Structural Members

Working with Bent Structural Members ...................... 154
3D Sketching .................................................... 154
Using Reference Planes ....................................... 154
Space Handle .................................................... 155
Subset of Sketch Entities and Relations .................... 155
Creating a 3D Sketch Plane ................................. 156
Active Planes .................................................... 158
Visibility controls .............................................. 158
Merge Arc Segment Bodies .................................. 160
Optional: Finishing Details ................................. 167
Exercise 10: Chair Frame .................................... 169
Exercise 11: Bent Tubing, Sheet Metal, and Assemblies .. 175

Lesson 5: Introduction to Structure System

Structure System .............................................. 188
Primary vs. Secondary Members ............................ 188
Primary Member Types ...................................... 189
Secondary Members ......................................... 193
Corner Management ......................................... 200
Exercise 12: Shed Frame .................................... 211