Enter a new dimension with the leading **3D technical drawing software**

SolidVorks FOR DUMALES

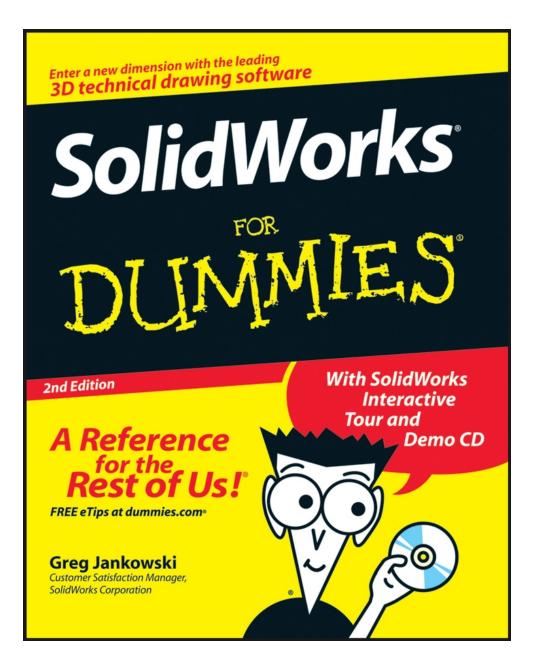
2nd Edition

A Reference for the Rest of Us!

FREE eTips at dummies.com

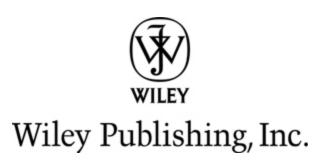
Greg Jankowski

Customer Satisfaction Manager, SolidWorks Corporation With SolidWorks Interactive Tour and Demo CD



SolidWorks For Dummies, 2nd Edition

by Greg Jankowski and Richard Doyle



SolidWorks For Dummies, 2nd Edition®

Published by Wiley Publishing, Inc. 111 River St. Hoboken, NJ 07030-5774 www.wiley.com

Copyright © 2008 by Wiley Publishing, Inc., Indianapolis, Indiana

Published by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Legal Department, Wiley Publishing, Inc., 10475 Crosspoint Blvd., Indianapolis, IN 46256, (317) 572-3447, fax (317) 572-4355, or online at <u>http://www.wiley.com/go/permissions</u>

Trademarks: Wiley, the Wiley Publishing logo, For Dummies, the Dummies Man logo, A Reference for the Rest of Us!, The Dummies Way, Dummies Daily, The Fun and Easy Way, Dummies.com, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. SolidWorks is a registered trademark of SolidWorks Corporation. All other trademarks are the property of their respective owners. Wiley Publishing, Inc., is not associated with any product or vendor mentioned in this book.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation warranties of fitness for a particular purpose. No warranty may be created or extended by sales or promotional materials. The advice and strategies contained herein may not be suitable for every situation. This work is sold with the understanding that the publisher is not engaged in rendering legal, accounting, or other professional services. If professional assistance is required, the services of a competent professional person should be sought. Neither the publisher nor the author shall be liable for damages arising herefrom. The fact that an organization or Website is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Website may provide or recommendations it may make. Further, readers should be aware that Internet Websites listed in this work may have changed or disappeared between when this work was written and when it is read.

For general information on our other products and services, please contact our Customer Care Department within the U.S. at 800-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

For technical support, please visit www.wiley.com/techsupport

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

ISBN: 978-0-470-12978-4

Manufactured in the United States of America

 $10 \ 9 \ 8 \ 7 \ 6 \ 5 \ 4 \ 3 \ 2 \ 1$

WILEY

About the Authors

Greg Jankowski is the Customer Satisfaction Manager at SolidWorks corporation. He is a veteran (translation: been doing this longer than he cares to admit) in the CAD industry with experience using SolidWorks, ProEngineer, and Computervision CAD systems in a variety of mechanical design and developmental positions. Greg was the Principal at CIMCO, a SolidWorks Solution Partner since SolidWorks 95.

Greg is the author of the book *SolidWorks for AutoCAD Users* and the e-book *Exploring SolidWorks*. In addition, he authored and developed the SolidWorks workstation benchmark. He is also the author of the *Cadalyst* magazine column "Solid Thinking" and is a regular columnist for the *SolidWorks Express* newsletter.

Richard Doyle is the User Community Coordinator at SolidWorks, responsible for helping SolidWorks user groups grow and thrive. A SolidWorks user since 1997, Richard has 29 years of experience in the field of mechanical drafting and design, including 22 years spent working with CAD. As one of the original founding members of the SolidWorks User Group Network (SWUGN) committee, Richard has spent a good deal of time helping to keep SolidWorks users informed and educated and enjoying the benefits of working with 3D CAD.

Dedications

Greg Jankowski: This book is dedicated to the three women in my life, my wife Sandy and daughters Alexis and Kaitlyn, who continue to put up with me and my crazy projects. I appreciate their patience, love, and understanding.

I also want to dedicate this book to all the hard-working folks at SolidWorks. It continues to be my pleasure to work with some of the best, hardest-working, and brightest folks in the industry.

Richard Doyle: This book is dedicated to the SolidWorks User Group Network (SWUGN) committee and all the SolidWorks user group leaders. These hardworking volunteers spend a lot of their own time making sure that fellow SolidWorks users have an outlet for networking and learning and for sharing information about SolidWorks and mechanical engineering.

Authors' Acknowledgments

Thanks to Ricky Jordan, who did the technical editing for this edition. Ricky's careful attention to detail and vast knowledge of SolidWorks made him the perfect choice.

Thanks to Greg Jankowski, who allowed me the opportunity to update this book for SolidWorks 2008.

Special thanks to Becky Huehls, project editor, who offered encouragement and advice and showed remarkable patience during this entire process.

Publisher's Acknowledgments

We're proud of this book; please send us your comments through our online registration form located at <u>www.dummies.com/register/</u>

Some of the people who helped bring this book to market include the following:

Acquisitions, Editorial, and Media Development

Project Editor: Rebecca Huehls

Acquisitions Editor: Kyle Looper

Copy Editor: Rebecca Whitney

Technical Editor: Ricky Jordan

Editorial Manager: Leah P. Cameron

Media Project Supervisor: Laura Moss-Hollister

Editorial Assistant: Amanda Foxworth

Sr. Editorial Assistant: Cherie Case

Cartoons: Rich Tennant (www.the5thwave.com)

Composition Services

Project Coordinator: Erin Smith

Layout and Graphics: Claudia Bell, Melissa K. Jester, Stephanie D. Jumper, Christine Williams

Proofreaders: ConText Editorial Services, Inc., John Greenough

Indexer: Sherry Massey

Anniversary Logo Design: Richard Pacifico

Publishing and Editorial for Technology Dummies

Richard Swadley, Vice President and Executive Group Publisher

Andy Cummings, Vice President and Publisher

Mary Bednarek, Executive Acquisitions Director

Mary C. Corder, Editorial Director

Publishing for Consumer Dummies

Diane Graves Steele, Vice President and Publisher

Joyce Pepple, Acquisitions Director

Composition Services

Gerry Fahey, Vice President of Production Services

Debbie Stailey, Director of Composition Services

Contents

<u>Title</u>

Introduction

About This Book

Conventions Used in This Book

What You're Not to Read

Foolish Assumptions

How This Book Is Organized

Icons Used in This Book

Where to Go from Here

Part I : Beginning the SolidWorks Journey

Chapter 1: Getting to Know (And Love) SolidWorks Exploring the SolidWorks Advantage Getting Your System Ready for SolidWorks Keeping Your Computer Happy Starting Up SolidWorks the First Time Checking Out the Features Chapter 2: Taking Control of SolidWorks Vorking with SolidWorks Documents Creating and Opening a Document Working with Templates Understanding the User Interface Getting a Better View of Things Exploring the SolidWorks Help Menu

Customizing the User Interface

Defining SolidWorks System Options

Chapter 3: Building Blocks for the Virtual Prototype

Planning and Capturing Design Intent (Or, Think First and Then Do)

Applying Layouts and Design Skeletons

<u>Part II : Design Intent and the Virtual Prototype</u>

Chapter 4: Do What I Mean, Not What I Sketch

Making and Editing a Sketch

Defining the Sketch

Chapter 5: Making Better Parts

Introducing Part Features

Working with the Features Toolbar

Creating Sketched Features

Making Applied Features

Designing Pattern and Mirror Features

<u>Building a Part</u>

<u>Building a Better Part</u>

Knowing How Much to Model

Chapter 6: Putting It All Together

Creating and Modifying the Assembly

Understanding Your Mates

Working with Your Virtual Prototype

Part III : The Devil's in the "Drawing" Details

Chapter 7: Creating Drawings

Becoming Familiar with Drawing Elements

Opening a New Drawing Document

Editing the Drawing Sheet Format

<u>Placing the Drawing Views</u>

Changing View Properties

Creating Drawing Dimensions

Adding Reference Annotations

Checking Spelling

Defining Drawing Tables

Chapter 8: Speeding It Up: Automating the Drawing

Planning for the Drawing

Inserting Model Items

Managing Drawing Clutter with Layers

Automating Drawing Creation

Working with Dimension Favorites

Creating the Drawing Template

Chapter 9: Changes, Changes, Changes

<u>Changing the Design</u>

Getting Information from Your Design

Chapter 10: Leveraging Your Existing Designs

Maintaining Old Drawing Files

Managing Configurations

Chapter 11: Printing and Plotting

Delving into Printing and Plotting

Installing a Printer in Windows

Setting Printer and Document Preferences in Windows

Choosing Print Options in SolidWorks

Printing a Document

<u>Part IV : Playing Nicely with Others (And Picking</u> <u>Up Your Toys)</u>

Chapter 12: Managing the Clutter

Managing Data with or without a Net

Managing Your Data Manually

Copying Files with SolidWorks Explorer

Chapter 13: Collaborating with Team Members

Keeping Everyone on the Same Page When Collaborating

Exploring Standard Design Elements

Working with Different File Formats

Chapter 14: Viewing and Reviewing Documents

Viewing with CAD Viewers

Sharing Models and Data with eDrawings

Using the SolidWorks Viewer

Including SolidWorks Documents in Your Presentations

<u> Part V : The Part of Tens</u>

<u>Chapter 15: Ten Tips for Becoming More Proficient with SolidWorks</u>
<u>Go to Class (Formal Training)</u>
<u>Be Creative (Nontraditional Training)</u>
<u>Check Local Reseller Events</u>
<u>Join a User Group</u>
<u>Aspire to Be a Superuser</u>
<u>Network Virtually: The Discussion Forum</u>

Take the CSWP Test

Document Your CAD Standards

Communicate Design Standards

Manage SolidWorks Well

Chapter 16: Ten Ways to Extend and Reuse Your Design Information

Show Off Your Model with Microsoft OLE

Share Models with SolidWorks 3D Instant Website

Spice Up Model Images with PhotoWorks

Simulate Movement with SolidWorks Motion Studies

Share Design Info with PDMWorks Workgroup

Test a Design with COSMOSWorks Analysis

Check Out Models' Moves with COSMOSMotion

Automate Tasks with the API and Macros

Schedule the Intensive Work with SolidWorks Task Scheduler

Find Various Manufacturing Software

Chapter 17: Ten Resources for the SolidWorks Community

SolidWorks and COSMOS User Groups

The SolidWorks Web Site

The SolidWorks Express Newsletter

The SolidWorks Customer Portal

The Certified SolidWorks Professional Program

<u>3D ContentCentral</u>

The SolidWorks Manufacturing Network

SolidWorks Solution Partners

SolidWorks Resellers

The SolidWorks Educational Community

Appendix: About the CD

System Requirements

<u>Using the CD</u>

What You Find on the CD

Troubleshooting

: Further Reading

Introduction

I started using SolidWorks when the first version, SolidWorks 95, came out on the market. It's amazing to see how far solid modeling has come since then. Working within a 3D environment has transformed the way I create, iterate, and document a design.

One reason I wrote this book is to help boil down much of the material that's out there and focus on not only what I believe to be important from my design experience but also how I think the software should be used.

Although many things are similar to what was done ten years ago, many things have changed. Even some of the saltier veterans out there can gain something from the ideas presented within this book.

SolidWorks is becoming a more mature application, and instead of getting harder to use, it makes modeling easier and, quite frankly, more fun.

One concept that recurs throughout this book is the ability of SolidWorks to reuse design information, saving you from having to do things manually. For example, SolidWorks can use the information in your part or assembly model to create manufacturing drawings automatically. This way of creating products saves time and produces better results. *SolidWorks For Dummies,* 2nd Edition, shows you how.

Enjoy your journey with SolidWorks. You'll love the experience.

About This Book

This book isn't designed to be read from cover to cover, although it can be. *SolidWorks For Dummies* is designed as a reference book that you can use at any time.

This book isn't meant to be a complete reference for SolidWorks. If it were, you probably wouldn't want to drop it on your foot. Instead, I have focused on the key and commonly used elements of SolidWorks.

Conventions Used in This Book

I use the following conventions throughout this book:

I use the term *document* to refer to drawing, part, or assembly files in SolidWorks.

✓ The list of items across the top of the SolidWorks interface comprises the main menu. Each item on the main menu also has a hidden list, or *pull-down* menu. Whenever I want you to choose a series of commands

from the menu, I use the phrasing "Choose File⇒Save," for example.

What You're Not to Read

Sometimes this book can be a little bit technical. But because I'm a nice guy, I always warn you about the stuff you can skip, by planting a handy Technical Stuff icon nearby. Although the information next to this icon is interesting, you don't have to read it. The same holds true for sidebars, which are the gray boxes that you see scattered throughout the book. Although the information in the sidebars is interesting, it's just extra information that's nonessential to understanding the topic at hand.

Foolish Assumptions

When I wrote *SolidWorks For Dummies,* I assumed very little about you — just that you're somewhat familiar with a computer and the Windows operating system. But I didn't assume that you have any earlier SolidWorks experience.

If you're not comfortable working with your computer, you may want to pick up a copy of *PCs For Dummies,* by Dan Gookin (Wiley), which walks you through the basics.

I also assume that you have a slight CAD system background. I counted on your having a basic knowledge of geometry, lines, circles, and points, for example. I don't, however, assume that you can create these objects.

One other assumption I make is that you have some experience in engineering or design or that you're pursuing a career in a related field.

How This Book Is Organized

This book has five major parts. Each part contains several chapters, and each chapter contains several sections. You can read any section without reading the entire book or even without reading earlier sections within that same chapter. Here's what you find in each part:

Part I: Beginning the SolidWorks Journey

This part introduces SolidWorks and 3D design. You find out about the user interface, SolidWorks file types, and system setup. I also highlight the new features in SolidWorks 2008.

Part II: Design Intent and the Virtual Prototype

This part contains the "beef" of the book. In this part, I talk about creating sound, robust 2D sketches and examine design intent. (Do what I mean, not what I sketch!) I also talk about the many ways to design and model a part and the virtual prototype.

Part III: The Devil's in the "Drawing" Details

Drawings are a necessary part of the manufacturing process. In this part of the book, I talk about how SolidWorks uses information captured in the model to create drawings automatically. I also cover several other SolidWorks drawing features that make your life easier.

Part IV: Playing Nicely with Others (And Picking Up Your Toys)

If you can't find anything on your desk, this chapter may be a tough read. This part focuses on managing and sharing information with other team members so that your projects are more effective.

Part V: The Part of Tens

The Part of Tens provides examples, tips, and references for SolidWorks. You discover how you can become more proficient in SolidWorks, as well as how you can reuse design information and extend the capabilities of SolidWorks. Lastly, you find out about resources in the vast SolidWorks community.

About the CD

The CD included with *SolidWorks For Dummies* contains a product demo and add-on solutions. For more information on the CD, see the "About the CD" appendix, at the back of this book.

Icons Used in This Book

Throughout this book, I use icons to flag information. Some icons mark topics that are useful down the line, whereas others warn you of geek topics ahead.

Here's what each icon means:



This icon flags useful tips and insight into the current topic. Read these tips carefully because they can save you time and effort.



Think of this icon as a message taped to your forehead. It serves as a gentle reminder to help reinforce a concept or an idea.



This icon says "Beware — potential problems lie ahead." To steer clear of trouble, pay close attention to the text that this icon flags.

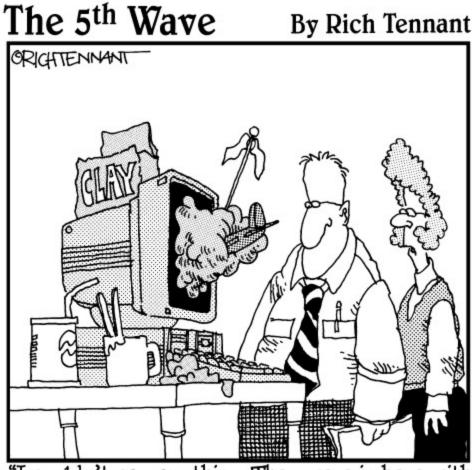


This one is for the technogeeks out there. (I number myself as one.) If you get bored easily, skip this text.

Where to Go from Here

If you're ready to get started, turn the page and keep reading or, better yet, review the table of contents or index to find topics that interest you. No matter which approach you choose, you're well on your way to becoming a SolidWorks user. Creating products in 3D is a fun and effective way to design. Enjoy!

Part I Beginning the SolidWorks Journey



"I couldn't say anything. They were in here with that program we bought them that encourages artistic expression."

In this part . . .

 $B_{eginning}$ the journey into 3D can seem daunting. It's not that bad — honest. In fact, it can be fun. This part introduces you to SolidWorks. You find out about some of the new features in SolidWorks 2008 as well as how to set up SolidWorks before you start your first design project. You also delve into the topics of design layout and intent.