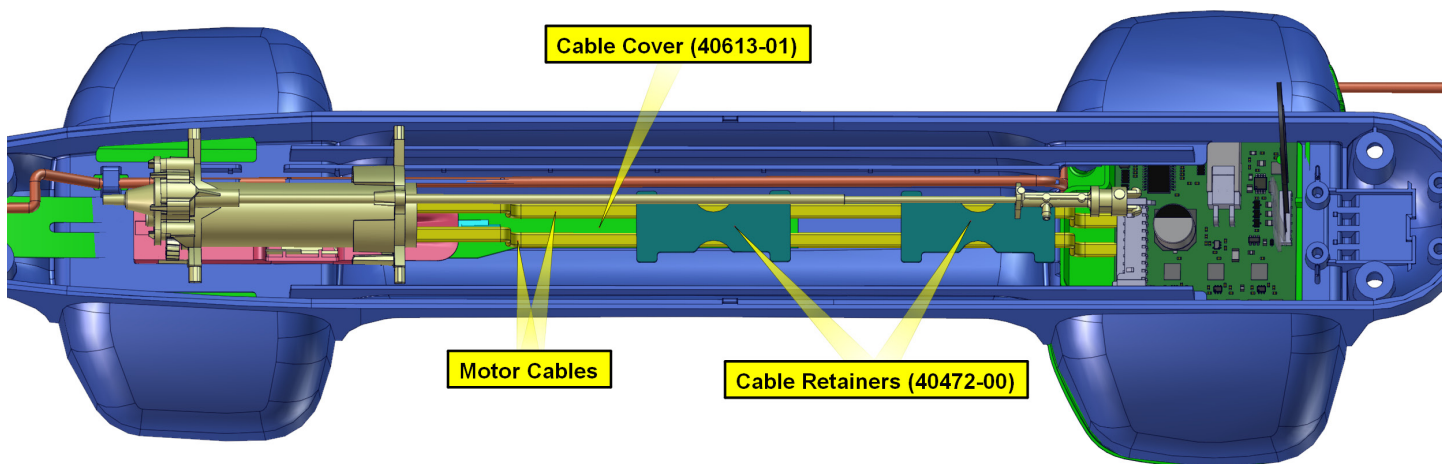


CARDIOVASCULAR SYSTEMS, INC.

Automating assembly of cardiovascular treatment devices with 3DVIA Composer



Click here for an animation of one of Cardiovascular Systems' conceptual designs created in 3DVIA Composer.

By adding 3DVIA Composer software to its SolidWorks product development solution, Cardiovascular Systems has improved the effectiveness of its assembly instructions and sales training materials.

The more than 17 million people who suffer from vascular disease now have a better treatment option for removing the health-threatening buildup of arterial plaque. Cardiovascular Systems, Inc. (CSI), is revolutionizing vascular disease treatments with sophisticated, high-tech devices that doctors use to treat patients who do not respond well to traditional therapies, such as angioplasty.

CSI's systems utilize a disposable, diamond-coated, catheter-based device and the principle of centrifugal force to grind away arterial plaque. They can remove up to 90 percent of plaque obstructions and are more effective than traditional treatments at removing calcified plaque. CSI's systems offer effective treatments when the blockage occurs in the extremities—peripheral arterial disease (PAD)—and the company is currently evaluating their effectiveness in the blood vessels surrounding the heart—coronary artery disease. CSI's systems offer treatments in a procedure known as orbital atherectomy. On the Diamondback 360® PAD System, the device orbits the interior artery wall at speeds of 200,000 revolutions per minute, grinding away plaque buildup.

The company commercialized its technology using the SolidWorks® 3D design platform, saving time and money in the process. However, CSI still needed a solution for automating the production and distribution of instructions that drive its sophisticated assembly operations, most of which occur in a Class 10,000 clean room, according to Design and Engineering Services Manager Christopher Narveson.

"I was attending a 'What's New in SolidWorks' seminar, conducted by our reseller (Symmetry Solutions, Inc.), when I saw 3DVIA Composer™," Narveson recalls. "I immediately understood how we could benefit from it. We have so much time and knowledge invested in our CAD models that it only makes sense to leverage the technology to create better work instructions to improve our assembly operations."

CSI added four licenses of 3DVIA Composer software to its SolidWorks development solution because the application enables its engineers to more easily and thoroughly communicate technical information about its products, whether for manufacturing assembly operations, internal sales training, or presentations to management.

Challenge:

Automate and streamline the preparation of training materials and assembly instructions to save time, reduce costs, and improve quality.

Solution:

Implement 3DVIA Composer software to automate and improve the preparation of technical communications.

Results:

- Cut assembly training time by 25 percent
- Facilitated preparation and updating of assembly instructions
- Improved quality of assembly instructions and sales training materials
- Mitigated clean room bioburden risk

Authoring more usable content

Before implementing 3DVIA Composer software, CSI engineers used word-processing applications, with screenshots inserted into the text, to create printed assembly instructions. This approach challenged CSI engineers not only to regularly publish and frequently update paper documents, but also to produce manufacturing documentation in a format that was usable by assembly operators. For example, operators were required to insert every page into a plastic sleeve and swab the documents with alcohol before taking them into the clean room.

With the 3DVIA Composer package, engineers can create easy-to-understand electronic instructions directly from SolidWorks CAD models, using storyboards linked to easy-to-follow animations of important procedures.

"We pride ourselves on maintaining a world-class level of manufacturing and simply must keep our manufacturing documentation up to speed," Narveson stresses. "We obsolete ourselves by developing new products every 12 to 18 months, and 3DVIA Composer enables us to create more visual, up-to-date, and effective instructions. Instead of performing elaborate paper-based document-cleaning procedures, our operators now work with instructions on a thumb drive displayed on flat-screen monitors that never leave the clean room."

Better prepared, more efficient assembly operators

After implementing 3DVIA Composer software, CSI realized immediate benefits through a 25 percent reduction in assembly operator training time, as well as more efficient assembly operations. The operators have fewer items in the clean room to worry about, mitigating the bioburden risk; electronic instructions virtually eliminate cleaning requirements related to documentation; and the engineers have a better tool for communicating with operators, resulting in fewer questions about specific procedures.

"The animations that we create with 3DVIA Composer have dramatically improved our operations," Narveson says. "We can show how every part goes into a complex assembly, and use cutaway and section tools to pinpoint areas of interest. The animations show how parts relate to assembly fixtures and how to use a range of custom-designed tools. Because the instructions are much more visual, the 3D aspect makes the conversation easier. Now, our operators' questions are not about understanding procedures but about refining or improving processes."

Getting the sales team on board

The success of using 3DVIA-authored animations for assembly instructions has led CSI to leverage the technology to train new employees and its sales force, which in turn works closely with physicians to demonstrate how to set up and use CSI products.

"The animations are a lot more effective for showing how to hook up a device," Narveson notes. "3DVIA has proven to be a valuable addition to our standard training arsenal."

"THE ANIMATIONS THAT WE CREATE WITH 3DVIA COMPOSER HAVE DRAMATICALLY IMPROVED OUR OPERATIONS."

Christopher Narveson
Design and Engineering Services Manager

Using 3DVIA Composer software, Cardiovascular Systems has transformed its assembly instructions from potentially confusing paper documents (top) to easy-to-understand 3D computer animations (bottom). Click each link to compare these materials.

CSI		WORK INSTRUCTIONS (W/I)		P/N 003-0078 REV. W	
TITLE: TURBINE BLOCK/SHAFT/CROWN, SHELL					
REVISION HISTORY RECORD					
REV	ECO #	DESCRIPTION OF CHANGE	DATE	APP	
A	474, 510	RELEASE TO PRODUCTION	05/03/07	CMN, LAW	
M	540, 575	SEE ECO's	03 JUN 08	PHB, SH	
Q	822, 887			VLS, PRB	
	1026, 1042			KTD	
	1068, 1179				
B	1385	ADD 70037 AND 70038 TO NOTE IN 4.3	22/05/08	LAW	
C	1444	ADD 70041 TO NOTE IN 4.3	10/05/08	CHE	
R	1572	Add Return 25007-00 Bushing Installer to the equipment list.	10/22/08	PHC	
I	2256	Add Return of the Insulin to Note 4.5 and additional text.	8/17/09	KTM	
U	2332	Sec 4, Table 4 - Woodruff shaft / turbine install method for P/N 70050-00 to allow ID hole step added to P/N 40002-00 (also on ECO 2332)	9/3/09	RDW	
W	2553	ADD 70063X TO TABLE 2	1/9/10	KTM	

1.0 PURPOSE
The purpose of this procedure is to assemble the SIA, TURBINE BLOCK/SHAFT/CROWN.

2.0 SCOPE
This procedure describes the process of assembling the SIA, TURBINE BLOCK/SHAFT/CROWN.

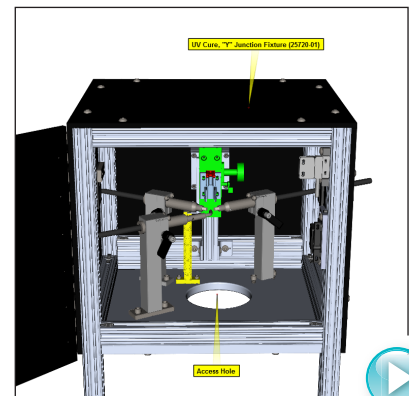
3.0 REFERENCE DOCUMENTS AND MATERIALS

3.1 REFERENCE DOCUMENTS
007-0009 ADHESIVE DOT TEST

3.2 MATERIALS
20018-00 ALCOHOL, 70% ISOPROPYL
30007-00 LINE, PTFE, 0.013" - 0.0100, NATURAL
30033-00 LINE, PTFE, 0.018"
30038-00 DOT TEST SHEET
30039-00 LINE, PTFE, 0.022"

3.3 EQUIPMENT
25100-00 DRIVER, SPANNER, CATHETER
25112-00 TUBE, INSERTION, TURBINE BLOCK
25209-00 ADHESIVE DISPENSING SYSTEM
25300-02 TYP. BLUE, 016, 1/2", 45° ANGLE
25301-00 TYP. PTFE LINED, JOAL PINK ADHESIVE TYP
25302-00 BARREL, 3MM PLUNGER
25314-00 SHAFT, TURBINE BUSHING
25335-00 SCREWDRIVER, POWER
25507-00 BUSHING INSTALLER

DESCRIPTION: WATERFIELD C-1 016 BLOCK C-1
CARDIOVASCULAR SYSTEMS, INC. Confidential



PREDATOR 3D
DIGITAL PRO SYSTEM

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