Agilent Practical Solutions Newsletter

Agilent
Trusted Answers

Volume 20, Issue 3

Dissolution of Cannabis and Cannabis-Derived Products

Bryan Crist, Scientific Affairs Manager, Dissolution

Public and commercial interest in cannabis and cannabis-derived products has increased dramatically over the last several years with legalization in numerous countries around the globe and the United States.

To date, the U.S. Food and Drug Administration (FDA) has not approved a marketing application for cannabis for treatment of any disease or condition except for Epidiolex (cannabidiol), and three synthetic cannabis-related drug products: Marinol (dronabinol), Syndros (dronabinol), and Cesamet (nabilone). These approved drug products are only available with a prescription from a licensed healthcare provider; and the FDA has not approved any other cannabis, cannabis-derived, or cannabidiol (CBD) products currently available on the market.

The FDA supports sound scientific research from the medical research community in the study of cannabis, and they are committed to encouraging the development of cannabis-related drug products.

In 2016, the FDA updated its Guidance for Industry: Botanical Drug Development, which provides sponsors with guidance on submitting investigational new drug (IND) applications for botanical drug products. Additional information on current cannabinoid dosage forms, novel delivery systems, and routes of administration may be found through a National Institutes of Health publication.

Very little information on dissolution testing of cannabis products exists in the public domain. The FDA dissolution database contains only a single cannabis-related method for dronabinol and, due to very poor solubility associated with cannabis products, it calls for a copious amount of surfactant. Dronabinol test conditions: Capsule, Apparatus II paddle at both 100 and 150 rpm, tested in 500 mL of 10% labrasol in water with time points of 5, 10, 15, 30, 45, 60, and until at least 80% of the labeled content is released. For this product, which is contained in a gel cap, a USP capsule rupture test should also be conducted.

Due to the poor solubility of most encapsulated cannabis products, experimental dissolution methods may require:

- Dissolution medium containing surfactants
- USP Apparatus 2 for greater shear rates within the vessel
- Higher rotational speeds, 75–100 rpm
- Greater time to Q, 45–60 minutes
- Lower acceptance criteria, 70–75%

Some products, such as Epidiolex (cannabidiol) for treatment of seizures associated with severe forms of epilepsy, have been formulated as an oral solution and will most likely not require a dissolution test.

Regarding the analytical testing of cannabis products, Agilent has provided a comprehensive guide for testing solutions. Applications and solutions have been developed by Agilent for pesticides, potency, heavy metals, residual solvents, terpenes, and microbial testing.

DDG DISSOLUTION DISCUSSION GROUP

The Dissolution Discussion Group (DDG) is an ideal site to pose a theoretical or application-oriented question. Here, you can receive support from thousands of members. The dissolution community allows you to tap into other users of dissolution equipment as well as the Agilent support staff. Do not be shy, enter your question!

How Do You Monitor Vibration in Your Dissolution Test Setup?

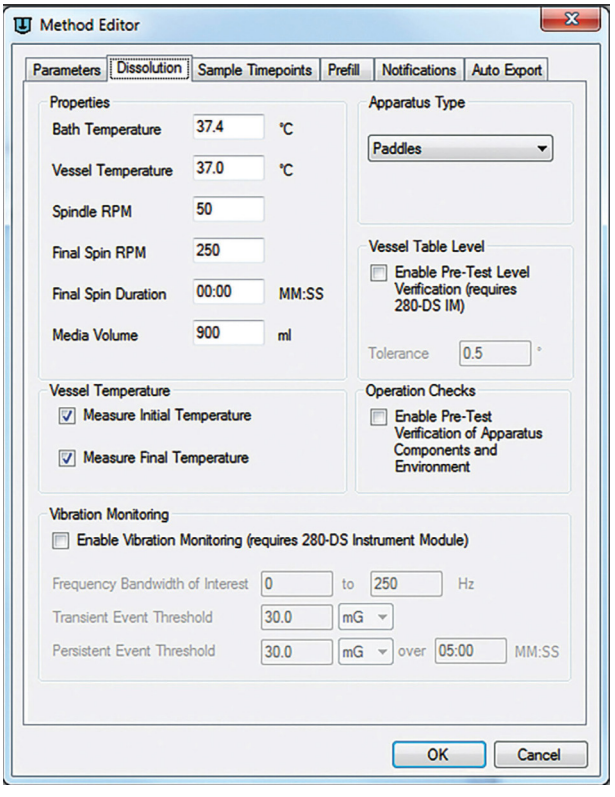
Karen Krauel-Göllner, Product Manager, Dissolution

The importance of vibration and environmental impact monitoring cannot be overstated—it provides important information on dissolution test setup. It has been known for many years that vibration can dramatically impact dissolution results. When referring to chapter 711 of the USP, there is only a brief mention of vibration requirements: "No part of the assembly, including the environment in which the assembly is placed, contributes significant motion, agitation, or vibration beyond that due to the smoothly rotating stirring element."

Whether or not your product is sensitive to vibration, there are options to support you. Regulatory bodies suggest that companies monitor and control the level of vibration. The lack of an industry-wide norm demonstrates how internal and external vibrations may affect each product and individual environment differently. With baseline values for vibration on the x-, y-, and z-axes, dissolution systems as well as their environments can consistently be monitored with the instrument module of the 280-DS mechanical qualification system (MQS) providing real-time environmental vibration measurements. Agilent dissolution workstation software supports laboratory capabilities to build, edit, search, retrieve, execute, and archive all dissolution methods and test information from a single interface.

This added benefit may be used during early research to develop internal vibration tolerances for specific methods, as part of a quality control initiative for well-established methods, or to watch for wear and tear to prevent instrument failure. If a failure should occur, this information speeds problem solving and helps to get instruments back online faster.

280-DS MQS instrument module

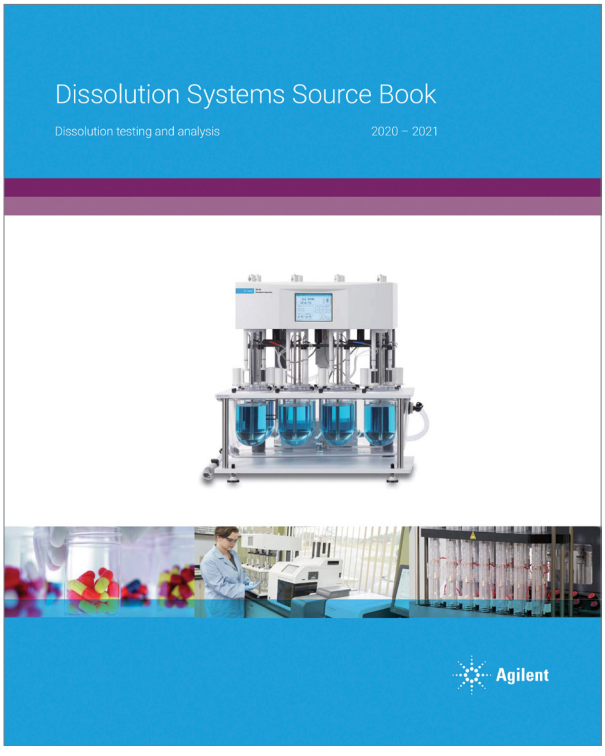


Dissolution Workstation software with vibration monitoring

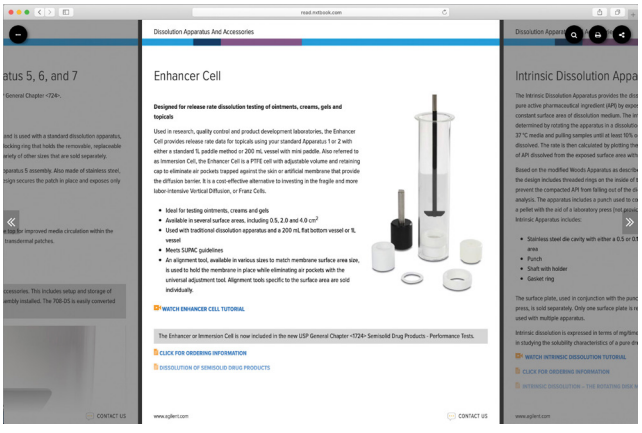
The Definitive Source for Dissolution Products and Information

Allan Little, Director of Marketing, Dissolution

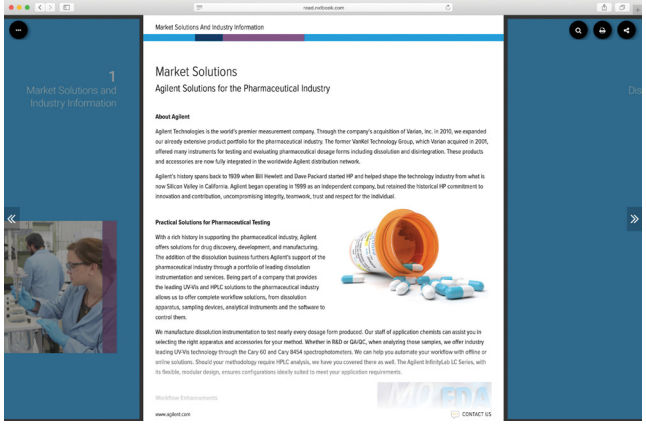
If you are looking for a new dissolution apparatus, sampling instrumentation, or dissolution accessories, the digital Agilent Dissolution Systems Source Book is the place to find it. Unlike a paper catalog, the digital version includes not only detailed catalog information, but links to videos, posters, brochures, and white papers as well.



Access the new version on your PC, phone, or tablet.



For a short video about a product or how to use it, click on one of the camera icons. PDFs of ordering guides as well as posters and papers are also accessible.



Each section can be accessed by paging left or right. Scroll up or down to find the detailed information.

Agilent Dissolution Community

Allan Little, Director of Marketing, Dissolution

The dictionary defines a community as "a social group of any size whose members share a similar character, agreement, or identity."

If you are involved with dissolution testing, please join the Agilent Dissolution Community.

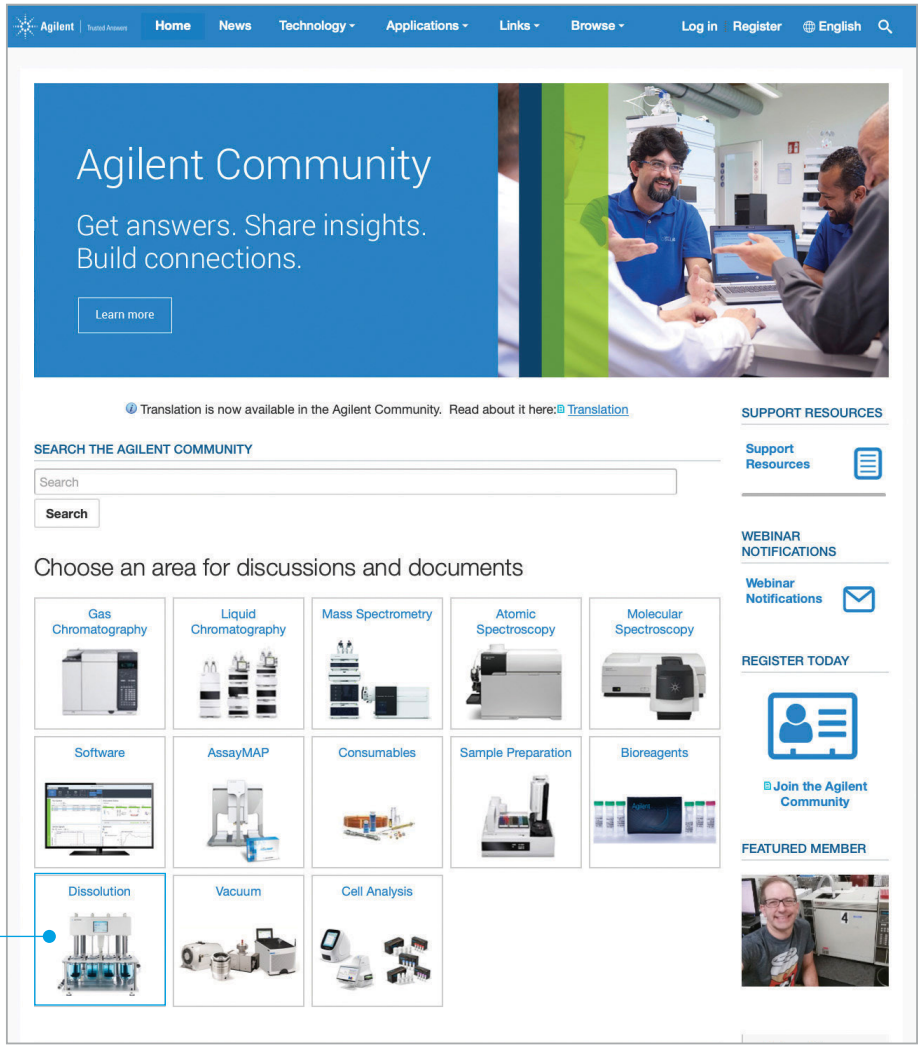
Whether you own VanKel, Varian, Agilent, or another brand of dissolution apparatus, you can take advantage of the resources this group provides.

Product categories include:

- Apparatus
- Autosamplers
- Online analysis
- Software/compliance
- Qualification and disintegration

Resources:

- Application notes
- Calculators
- Catalogues
- Demonstration videos
- FAQs
- Newsletters
- Operator manuals
- Troubleshooting guides
- White papers



Join the community today. It is easy to log in, share, and follow other dissolution users. Simply navigate to www.agilent.com. Click on "Resources" and then "Agilent Community." The "Dissolution" section can be found here.

Getting a Clearer Picture: What Is New with dissoGUARD?

Dan Spisak, Product Manager, Dissolution

Merel's dissoGUARD surveillance system cameras provide a unique view of the dissolution process. Dissolution laboratories have utilized these visualization capabilities to study tablet behavior of various dosage form types over the years. The standard features of the dissoGUARD system provide tremendous value with viewing, recording, video export, and dynamic lighting capabilities. When coupled with the dissoGUARD PRO software, physical monitoring of RPM, wobble, and vessel-to-shaft centering are enabled for additional insights during the dissolution test.

With the latest software update, video capabilities have been enhanced to give the user more options for data gathering and export:

- Added capability to export partial videos
- Ability to easily enable or disable the external camera from the system control panel
- Ability to comment on every event marker on the timeline in the video player
- Ability to save comments to a text file in recording path directory

For more information about equipping the Agilent 708-DS dissolution apparatus with the dissoGUARD surveillance system and software from Merel, contact your Agilent representative. To schedule a live demonstration of the 708-DS and dissoGUARD solution, contact: dissolution.hotline@agilent.com

dissoGUARD system with dissoSHIELD

Read about how one laboratory utilized dissoGUARD to gain additional information and insight into drug release and the swelling process of DF–Na/HPMC tablets.

Questions You Asked

Bryan Crist, Scientific Affairs Manager, Dissolution

Q. While performing testing on the Agilent BIO-DIS reciprocating cylinder apparatus (USP Apparatus 3), we found that the glass cylinder occasionally unscrews from the top cap during the test. The dissolution medium contains 0.4% sodium lauryl sulfate (SLS), do you think this could be the reason?

A. It is very important that the cylinders are tightly connected to the cap, as well as the cap to the drive shaft. Surfactants should not enhance loosening during the test, unless they were not properly cleaned between uses, in which case surfactant residues could have loosened the grip. First, ensure that the caps are not cracked in any way and that the threads in the cap are clean and not damaged. Next, tighten the caps to the cylinder containing the drug first, then screw into the drive shafts and hand tighten the entire cylinder by turning the lower cap. Remember, the cylinder tube is glass, so do not overtighten or hold the glass portion while tightening.

Agilent BIO-DIS reciprocating cylinder apparatus
(USP Apparatus 3)

Learn more:
www.agilent.com/lifesciences/dissolution

Agilent Community:
https://community.agilent.com/

Register to receive the e-newsletter quarterly by email:
http://explore.agilent.com/practical-solutions

Buy online:
www.agilent.com/chem/store

Contact Agilent's dissolution chemists:
dissolution.hotline@agilent.com

U.S. and Canada
1-800-227-9770
agilent_inquiries@agilent.com

Europe
info_agilent@agilent.com

India
india-lsca_marketing@agilent.com

Asia Pacific
inquiry_lsca@agilent.com

DE.4388194444

Published in the USA, March 19, 2020
5994-1738EN

Agilent
Trusted Answers