

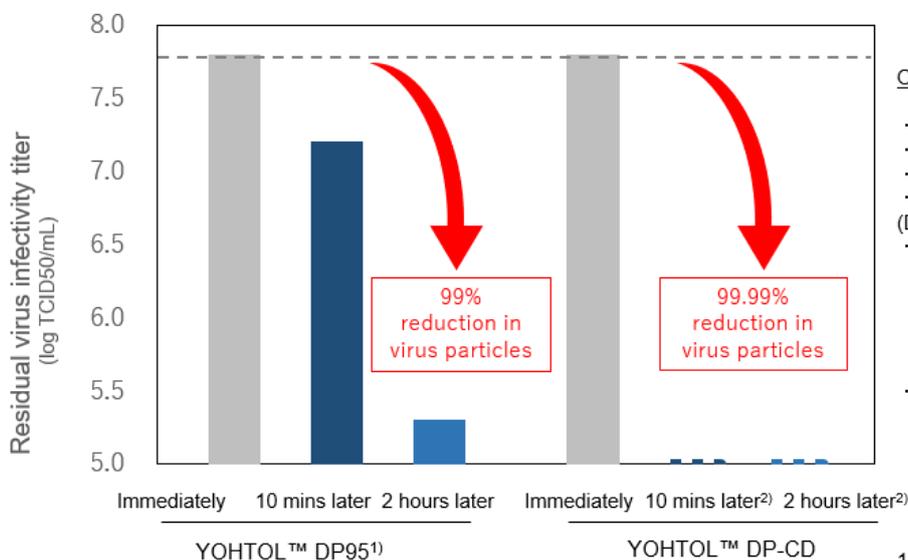
Mitsui Chemicals' YOHTOL™ Range of Iodine-Based Antibacterial and Anti-Mold Agents Proven to Have Antiviral Capabilities

Mitsui Chemicals, Inc. (Tokyo: 4183; President & CEO: HASHIMOTO Osamu) today announced that its YOHTOL™ product range has been proven effective against viruses. YOHTOL™ is a range of iodine-based antibacterial and anti-mold agents containing diiodomethyl-p-tolyl sulfone (DMTS) as their active ingredient.

Effects Against the Influenza Virus

Tests performed at Japan Food Research Laboratories found that YOHTOL™ DP95 and a product derived from it, YOHTOL™ DP-CD, inactivated the influenza virus. In viral infection tests on cells, the number of virus particles fell by 99 percent from the count at the start of the test in the two hours after YOHTOL™ DP95 was added. YOHTOL™ DP-CD brought about a 99.99 percent reduction in the number of virus particles in just 10 minutes. The water solubility of YOHTOL™ DP-CD is presumed to have contributed to its swifter action.

<Effectiveness in inactivating the influenza virus>



Overview of test

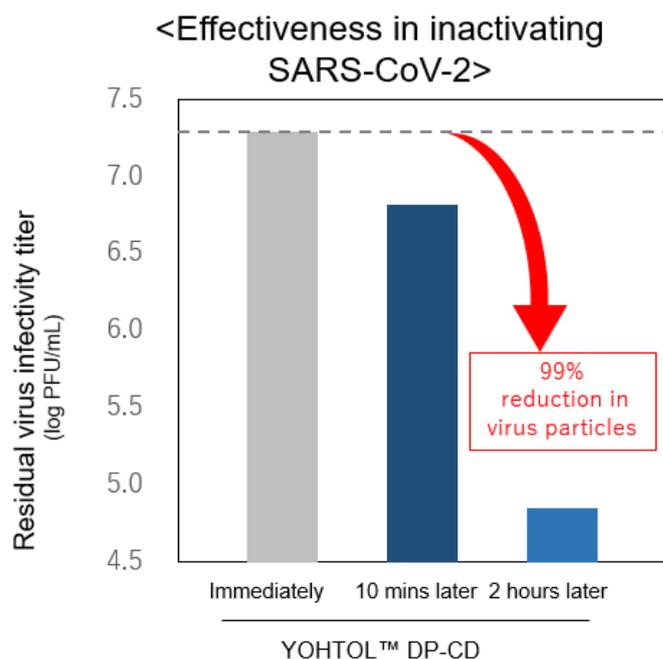
- Virus tested: Influenza A virus (H1N1)
- Median tissue culture infectious dose
- Detection limit: $1.0 \times 10^{3.5}$
- 0.1Wt% added as active ingredient (DMTS)
- Evaluation criteria set by Mitsui Chemicals: Based on ISO 21702, it was deemed to demonstrate antiviral activity if the difference from the count immediately after the start of the test showed a decline of at least 10^{-2}
- Purified water alone was used as a control and found not to have any antiviral effect

- 1) Results of evaluation as a fluid dispersion
 2) Below the detection limit

Effects Against COVID-19

In tests performed at the Japan Textile Products Quality and Technology Center, YOHTOL™ DP-CD was also confirmed to be effective in inactivating the SARS-CoV-2 virus that causes COVID-19.

Similar viral infection tests showed that the number of virus particles fell by 99 percent within two hours of the agent's use. While YOHTOL™ DP-CD is not immediately effective, it is presumed capable of maintaining its antiviral effect for a certain length of time.



Overview of test

- Virus tested: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)
- Plaque assay
- 0.1Wt% added as active ingredient (DMTS)
- Detection limit: $1.0 \times 10^{2.6}$
- Evaluation criteria set by Mitsui Chemicals: Based on ISO 21702, it was deemed to demonstrate antiviral activity if the difference from the count immediately after the start of the test showed a decline of at least 10^{-2}
- Purified water alone was used as a control and found not to have any antiviral effect

*The test results described above demonstrate the agents' effectiveness when used directly and do not guarantee the effectiveness of products containing these agents.

■ Overview of YOHTOL™ DP95

Mitsui Chemicals began production and sales in 1985 for YOHTOL™ DP95, an anti-mold agent that excels at inhibiting the growth of a wide range of mold species. The product is used in wood preservation, paints, leather, wallpaper and more. YOHTOL™ DP95 is registered on a positive list for anti-mold agents by the Society of International Sustaining Growth for Antimicrobial Articles (SIAA), and its active ingredient, DMTS, is similarly registered on a positive list run by the U.S. Food and Drug Administration (FDA).

■ Overview of YOHTOL™ DP-CD

Mitsui Chemicals developed YOHTOL™ DP-CD in partnership with CycloChem Bio Co., Ltd. (Kobe, Japan; President: TERAOK Keiji). Combining Mitsui Chemicals' iodine-based anti-mold agent YOHTOL™ DP95 with CycloChem Bio's cyclodextrin resulted in a water-soluble substance with enhanced antibacterial properties. In addition to the applications available with YOHTOL™ DP95, the aqueous antibacterial and anti-mold solution can be put to a wide range of other uses employing water as the principal component. Examples here include water-based paints, water-based adhesives, and metal and lens machining fluids. A powdered version of YOHTOL™ DP-CD is also currently under development.

Previous news release: https://jp.mitsuichemicals.com/en/release/2019/2019_0918.htm