IMSDesign Cloud Projection Software

www.imsdesign.com

IMSDesign Cloud the world's first cloud-based membrane projection software which can be accessed on www.imsdesign.com. It empowers you with the flexibility to perform membrane projections, anytime, anywhere using any device. This next gen integrated membrane projection software will enable you to simulate various combinations of RO, NF and UF membrane projections in a seamless manner.

IMSDesign Cloud is a major upgrade to the existing desktop version with enhanced features, supplemented by the cloud technology to meet your business objectives. This cloud-based projection software is the first of its kind in the industry as it is safeguarded with the latest security measures to back up your design files. Moreover, you are no longer required to manage your company's security which prohibits software from being downloaded to your computer since IMSDesign Cloud runs directly from the web.

This thoughtfully designed unique web simulator is strengthened with an array of new features that makes it a value-added tool. Below is a brief summary of IMSDesign Cloud's key features:

Key Features of IMSDesign Cloud

► **Project rejection of an organic compound:** The designer can project the rejection of one organic compound. All he has to do is input the Feed Concentration (e.g., 10 mg/l of TOC or caffeine or PFAS) and then input the % rejection acquired by pilot or lab work or prior knowledge. The permeate and concentrate levels are then calculated.

► **Project rejection of two non-standard custom cation/anion inorganic ions:** The designer can project the rejection of two non-standard custom inorganic ions. All the user has to do is key in the ion details, e.g., for cation Li, input the molecular weight of 6.9, input the valance state of +1, and then input the % rejection acquired by pilot or lab work or prior knowledge. The permeate and concentrate levels are then calculated.

► **Soften your feed water:** The designer simply has to click on the Softener as Feed tab and it automatically softens the feed to 5 mg/l total calcium and magnesium hardness. This is displayed on the printouts.

► **Make any stage a Hybrid:** The Hybrid option has been upgraded to allow the creation of a hybrid stage of multiple RO elements in the pressure vessels of that array. Previously, the Hybrid option was limited to the 1st stage only. E.g., you can now design with 3 CPA7-LD elements followed by 4 ESPA2-LD elements in a single pressure vessel in the 2nd stage to help balance fluxes for reduced fouling.

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► **Pick the design feed pressure and have it calculate an appropriate permeate flow and % recovery:** The designer can pick the Feed Pressure option and the program will make the necessary adjustments to the permeate flow and % recovery that results from the inputted feed pressure. This option has proved useful when the designer is using the software with a design that creates convergence issues due to the selection of too high a recovery and permeate flow. It also provides a way to model an operating system to compate actual and projected performance.

► **Troubleshooting enhancement:** You now have access to one of the best troubleshooting tools where the estimated permeate conductivity of each element is listed next to the projected permeate TDS to show you what you can expect if you were doing an on-site series probe of the pressure vessels with a conductivity monitor. This feature simulates a system in which the permeate in the pressure vessel of each stage flows from the feed-end of the vessel to the concentrate-end of the vessel.

► **Conductivity options:** The program has always reported conductivity compensated to 25°C to match readings of temperature-compensated conductivity meters. The user now has the option to view the conductivities without temperature compensation.

► **The element selection is now even easier:** When the designer has to select an element, he can now sort on a number of choices. He can choose to show all elements or he can filter his search to show 4" or 8" elements only, or display elements of a specific membrane family such as CPA, ESPA, ESNA, SWC or LFC.

► **The Design Guidelines have been updated:** The wastewater feed category has been expanded to include municipal waste and industrial waste for design purposes and alarms.

► **HYDRAcapMAX has been updated:** For HYDRAcapMAX, the guidelines have been updated for ground water, surface water, seawater, and municipal wastewater. The print layout has changed to reduce number of pages and align more with the IMSDesign printout. The report shows recovery cleaning wastewater. There are now more options for design volume unit selection.

Key Benefits of Upgrading to IMSDesign Cloud

► **User-friendly Interface:** A user friendly interface, similar to previous version, with minimum learning time.

► **Backward Compatibility:** Run projection files created in previous software versions (from 2008 onwards) and save them on the cloud. Once saved, they will remain on the cloud, thus offering easy access.

► **Cross-Platform:** Access your projections from various devices which run on either Windows, macOS or Android operating systems.

► **Auto Update:** IMSDesign Cloud is always auto updated and thus enables you to do more, faster.

► **Integrated Simulator:** Integrate RO, NF and UF (HYDRAcapMAX) technologies in your projections.

► **Feed Pressure Input:** Accurately predict performance by entering feed pressure as input.

► **Simulate Custom Organics:** Include organic chemicals and BOD, COD, TOC to predict performance accurately.

► **Go Hybrid:** Apply the "hybrid" feature for all 6 stages in both passes.

► **Sending & Forwarding Projections:** Share your projections with your colleagues or regional technical team member and seek their expert views and guidance.

► **Multi-lingual:** Supports 7 languages – English, French, Spanish, Portuguese, Chinese, Japanese and Russian.

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Other enhancements in IMSDesign Cloud

▶ **New ESNA4-LD:** The new, nanofiltration membrane, ESNA4-LD, is now available. This is our highest rejecting NF element with 400 ft^2 of membrane area, 34 mil feed spacer, and is rated for 8,000 gpd and 99.0% NaCl rejection at standard test conditions of 75 psi and 500 ppm NaCl.

▶ **Improved Accuracy in IMSDesign for all RO elements based on lab and field testing over the years:**

  ▶ All CPA7 membranes will project Silica passage 20% lower than the previous permeate levels

  ▶ All CPA, ESPA (except for ESPA4 which had been updated in 2018), and LFC brackish water RO elements will project Total Hardness (Ca and Mg ions only) passage 90% lower than the previous permeate levels

  ▶ All CPA, ESPA (except for ESPA4), and LFC RO elements will project Sodium (Na) passage at 10% higher than previous permeate levels

  ▶ All SWC Seawater RO elements will project Boron (B) passage at 10% higher than previous permeate levels

▶ **Performance improvements for lower energy requirements and feed pressure with equivalent permeate quality have been made to the ESNA1-LF and ESNA1-LF2 NF elements:**

  ▶ The ESNA1-LF-LD-4040 4-inch element is now rated at 1,900 gpd and 93% CaCl$_2$ rejection (it was 1,600 gpd and 92%).

  ▶ The ESNA1-LF-LD 8-inch element is now rated at 9,500 gpd and 93% CaCl$_2$ rejection (it was 8,400 gpd and 92%).

  ▶ The ESNA1-LF2-LD-4040 4-inch element is now rated at 2,400 gpd and 91% CaCl$_2$ rejection (it was 2,000 gpd and 89.5%).

  ▶ The ESNA1-LF2-LD 8-inch element is now rated at 12,000 gpd and 91% CaCl$_2$ rejection (it was 10,500 gpd and 90%).

▶ **Ammonia Gas:** Ammonia gas (NH_3) is now calculated in all streams. This can be important to any system which has NH_4^+ ion present. When one enters the cation ammonium NH_4^+ ion the mg/l NH_3 gas level is calculated based on NH_4^+ ion level, temperature and pH. NH_3 gas also contributes conductivity and this is added to all conductivity calculations which is important in projecting a more accurate estimate of µS and in troubleshooting with a conductivity monitor on site.

▶ **Arsenic (As-V) and Mercury (Hg-2) have been added to Custom Ions along with the following existing cations:**

  ▶ Cadmium (Cd), Copper (Cu), Chromium (Cr), Iron (Fe), Cobalt (Co), Nickel (Ni), Molybdenum (Mo), Silver (Ag), Aluminum (Al), Lead (Pb), Zinc (Zn), Radium (Ra), Uranium (U), and Manganese (Mn)

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► **Improved Fluoride (F) rejection accuracy which more accurately projects higher fluoride passage as feed pH decreases from 7.6.**

pH Effect on Fluoride % Rejection in IMSdesign
(based on CPA7-LD, 25C, 13 gfd, mixed ion feed of 700 ppm)
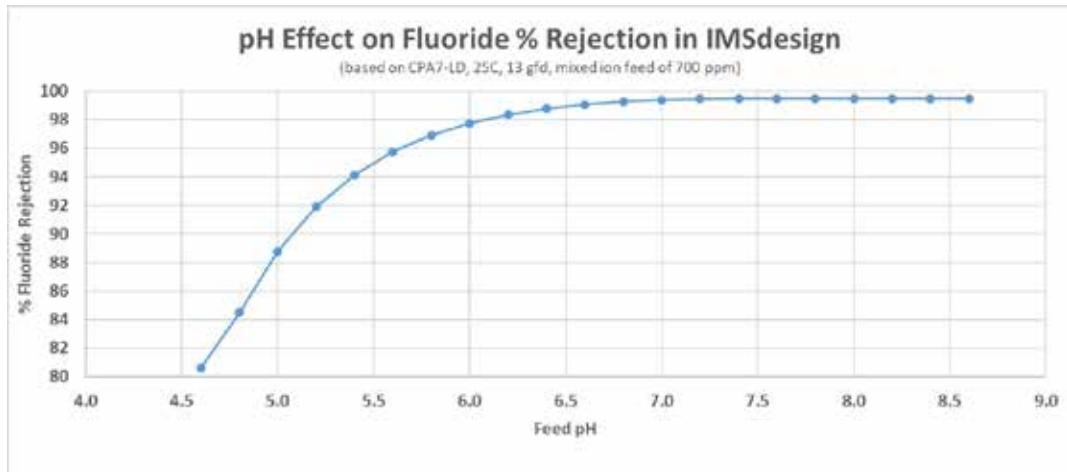
Many additional features are already in development for this projection software. Please follow these developments to take complete advantage of this powerful tool.

If you have any issues installing or running this software, please send an e-mail to support@imsdesign.com

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