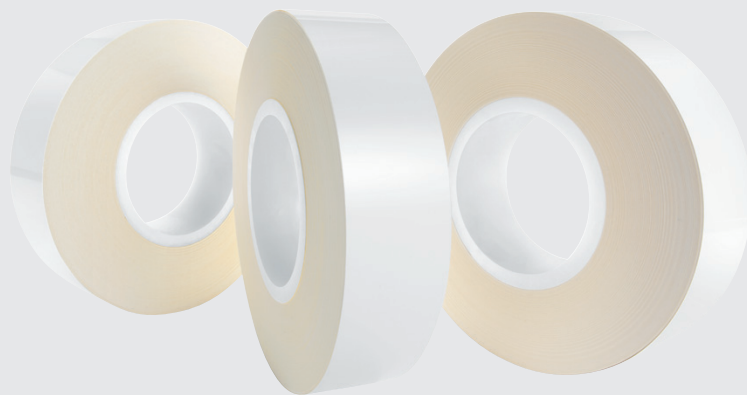


Unisart® CN 180 DX Membrane



Introduction

The Unisart® CN 180 DX membrane is the newest lateral flow membrane in our portfolio. It combines high protein binding capacity with superior sensitivity for critical applications such as HIV and malaria tests. All raw materials are REACH compliant.

Unisart® CN 140 is the gold standard in our portfolio. This membrane is suitable for a broad range of applications, as it offers a good balance between protein binding, sensitivity, and capillary speed.

For critical applications, such as infectious diseases (e.g., HIV and malaria), very high protein binding and sensitivity is needed. Therefore, Unisart® CN 180 DX was developed. The new membrane has a nominal pore size of 5 µm, which is the smallest in our product portfolio. As a result, the inner surface area is increased, and more protein can be bound. The combination of increased protein binding and decreased capillary speed, results in enhanced signal intensity.

In the following, we compare our gold standard Unisart® CN 140 with the new Unisart® CN 180 DX in terms of protein binding capacity and sensitivity.

Protein Binding Capacity

The new Unisart® CN 180 DX shows high protein binding capacity, as demonstrated in Figure 1.

The protein binding capacity for Unisart® CN 180 DX is 30 % higher than for Unisart® CN 140.

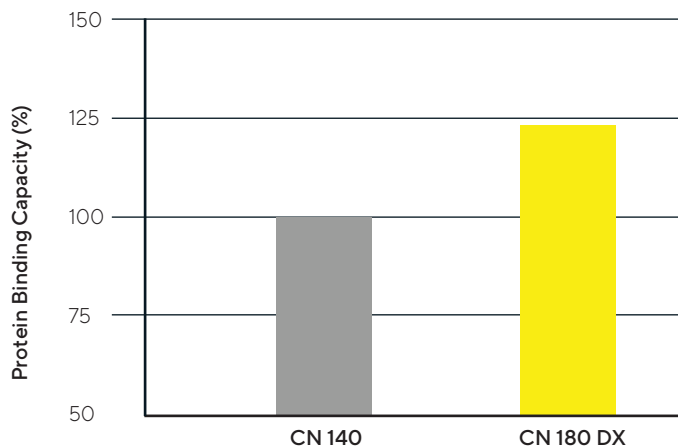


Figure 1. Comparison of protein binding capacity: To identify the protein binding capacity of Unisart® CN 140 and CN 180 DX, a BCA test was performed of five different lots for each Unisart® CN membrane type. The average protein binding capacity was normalized and is depicted as bar diagram in percentage. The protein binding capacity of Unisart® CN 180 DX (in yellow) is shown in relation to Unisart® CN 140 (in gray).

Signal Intensity

The higher binding capacity of the Unisart® CN 180 DX results in superior protein signal intensity.

Figure 2 shows the binding of fluorescent labeled BSA to Unisart® CN 140 and CN 180 DX at four different concentrations.

As illustrated, the protein lines for Unisart® CN 180 DX are sharp in morphology (Figure 2A) and the signal intensity is on average 40 - 50 % higher compared to Unisart® CN 140 (Figure 2B).

This, in combination with the decreased capillary speed, makes Unisart® CN 180 DX the most sensitive lateral flow membrane in our portfolio.

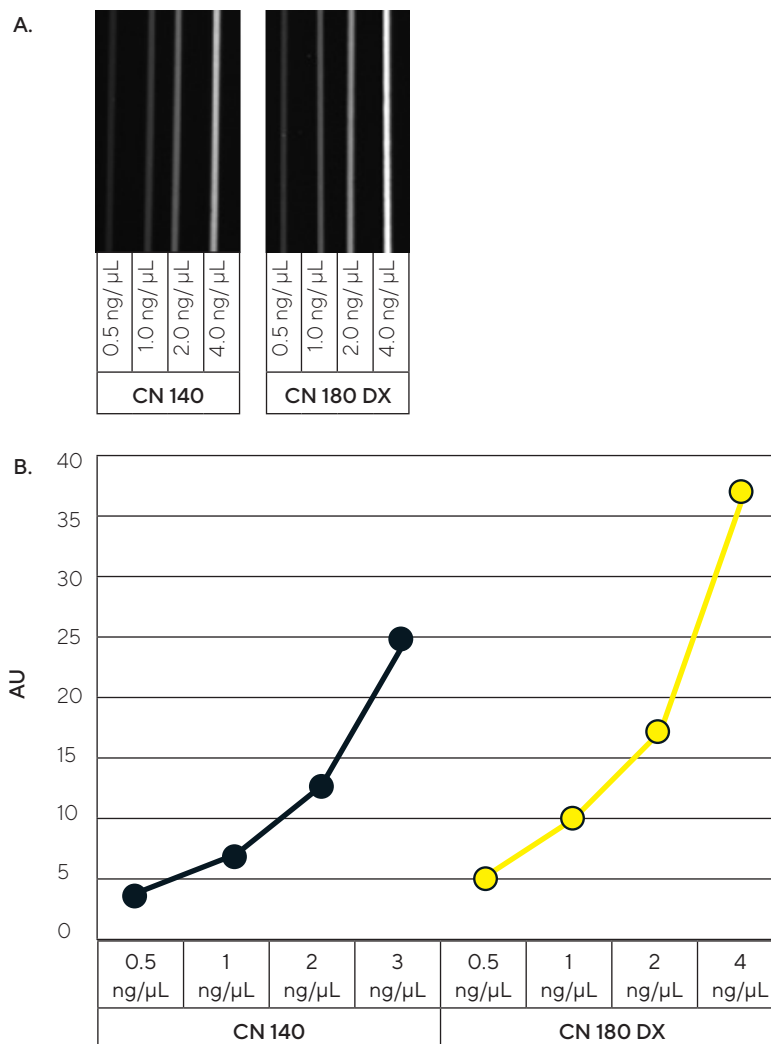


Figure 2. Comparison of protein signal intensity: To analyze protein binding and its corresponding signal intensity, four different protein concentrations of Alexa555-BSA (0.5 ng/µL, 1 ng/µL, 2 ng/µL, 4 ng/µL in phosphate buffer, pH 6.4) were printed on Unisart® CN 140 and Unisart® CN 180 DX with a printing rate of 1 µL/cm. **(A)** Visual demonstration of line quality. **(B)** The fluorescence was quantified with the ChemiDoc MP imaging system (Bio-Rad). With increasing protein concentration, the fluorescence signal intensity (in AU) raises concomitantly.

Test Performance

We performed a flu A test as an example for an infectious disease assay (Figure 3).

The flu A test confirms the high binding capacity and signal intensity of Unisart® CN 180 DX. As shown in Figure 3, the signal intensity is about 25 % higher than for Unisart® CN 140.

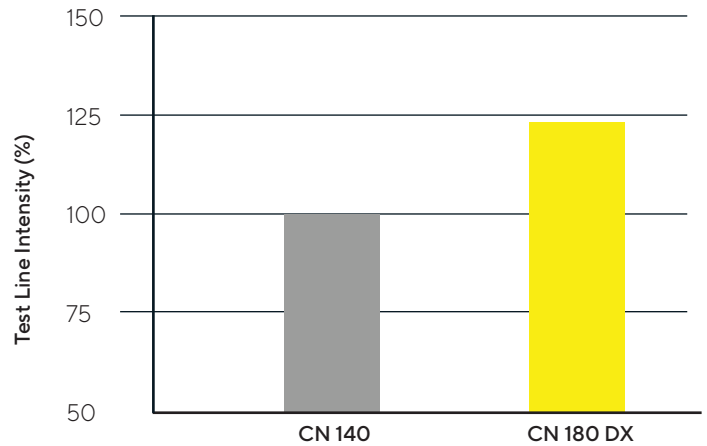


Figure 3. Comparison of test performance: To show the performance of Unisart® CN 140 and Unisart® CN 180 DX, the membranes were used in a flu A test. For this, anti-flu A antibody was printed on the test line (1 mg/mL) and conjugated to latex beads (400 nm). Recombinant flu A nucleoprotein (100 µg/L) was used. Test line intensity was quantified after 10 min. The bar diagram shows the normalized test line intensity in percentage (gray: Unisart® CN 140; yellow: Unisart® CN 180 DX). The test line intensity of Unisart® CN 180 DX is depicted in relation to Unisart® CN 140.

Conclusion

The new Unisart® CN 180 DX, with its high binding capacity and crisp lines, is the membrane of choice for critical applications where sensitivity is crucial. The combination of slower capillary speed and higher binding capacity allows for the detection of smaller and/or lower concentration analytes in your samples.




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