

April 17, 2020

Dear Valued Customer,

Use of Terumo Cardiovascular's CAPIOX® FX25 Oxygenator in Extracorporeal Membrane Oxygenation Therapy

Background

In accordance with FDA's Enforcement Policy for Extracorporeal Membrane Oxygenation and Cardiopulmonary Bypass Devices During the Coronavirus Disease 2019 (COVID-19) Public Health Emergency, Guidance for Industry and Food and Drug Administration Staff, which was issued on April 6, 2020, Terumo Cardiovascular is providing you an update regarding our CAPIOX FX25 oxygenator (see Appendix A for list of applicable devices).

Using CAPIOX FX25 Model Oxygenators for Extracorporeal Membrane Oxygenation (ECMO) Therapy

CAPIOX FX25 oxygenators are currently indicated for up to six (6) hours of continuous use. While Terumo Cardiovascular does not have FDA approval or clearance for continuous usage of the device for longer than six hours or for ECMO therapy, the above-referenced FDA Guidance designates many hollow fiber oxygenators, including the CAPIOX FX25, as technologically capable of being used for ECMO therapy.

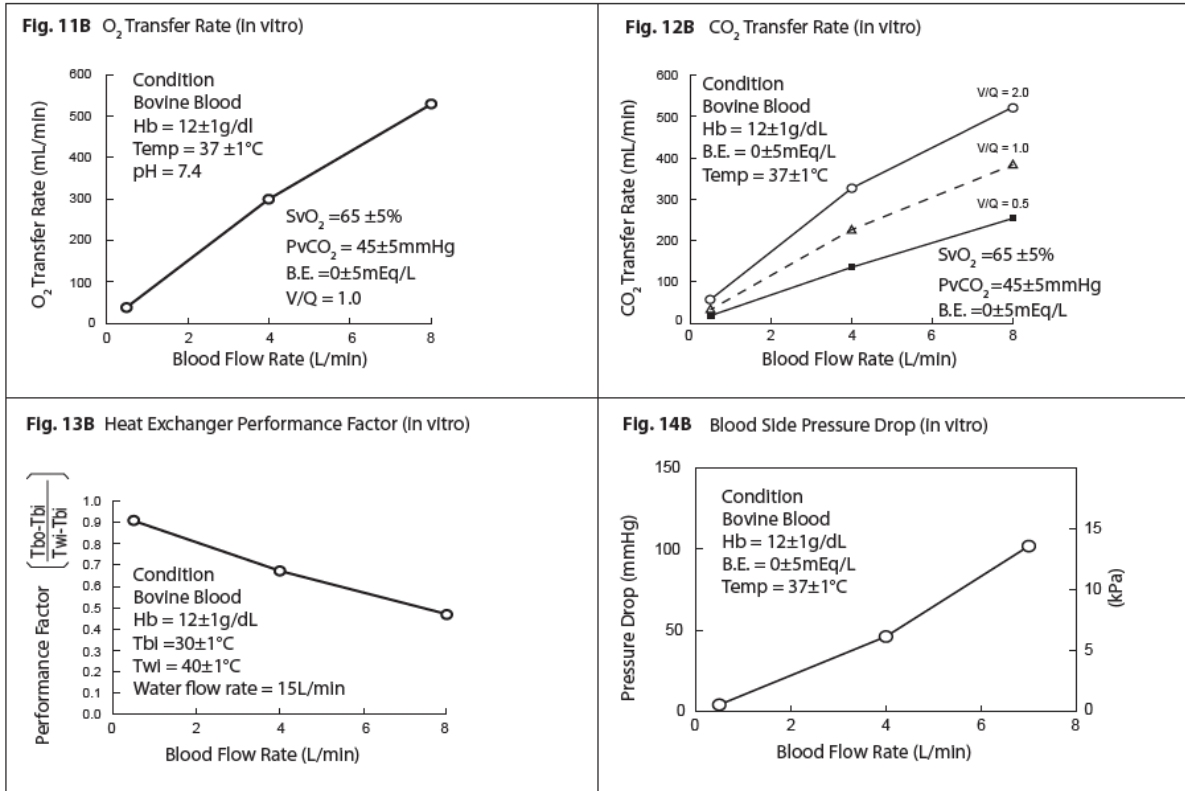
In order to support emergency use of this device for ECMO therapy, we have provided some relevant performance and durability information, an overview of key risks, and a summary of signs indicating that a device change out is necessary.

Performance and Durability

Provided within are the relevant product performance and durability data excerpts from the currently approved and cleared Instructions for Use (IFU) which may be helpful when considering usage of the oxygenators in ECMO therapy.

Shown below is performance data for the 0.5 to 7.0 LPM rated flow range. This includes oxygen transfer rate, carbon dioxide transfer rate, heat exchanger performance factor, and blood side pressure drop data.

FX25 PERFORMANCE DATA



Durability of the device (integrity of the blood and water pathways tested to 1.5 times the rated pressure) as well as the above performance characteristics are stable over the 6-hour indicated use period when adequate heparinization (anticoagulation) is achieved.

Risks Associated with Using a CAPIOX FX25 Oxygenator in ECMO Therapy

The microporous hollow fiber membrane oxygenator will require more frequent change-out during an ECMO procedure than a polymethylpentene (PMP) oxygenator found in a traditional ECMO circuit design.

Potential risks, which are well known to clinicians utilizing these devices, are associated with the replacement process of an underperforming oxygenator. The potential risks to patients during oxygenator change outs are influenced by the skill of the clinician, the stability of the patient at the time oxygenator replacement is required, and the design of the ECMO circuit. A brief interruption in metabolic support may be required to facilitate change out.

Hypoperfusion, hypoxemia, further metabolic compromise, blood loss, air embolism, and infection are potential risks associated with oxygenator change-out. ECMO teams are trained on how to handle oxygenator changeout situations.

Additional risks include the increase of stress on the tubing connections and the stability of the device should the patient be moved or transported while on ECMO. In order to ensure stability of the tubing connections and the overall device, ensure that all connections are securely tie banded and the oxygenator holder is securely attached to the ECMO cart throughout use.

Signs Indicating a Device Change Out May Be Needed

Use beyond six hours may result in some changes to performance and physical characteristics of the device. This may be due to the increased likelihood for plasma to penetrate the oxygenator membrane's microporous surface or for formed elements to deposit on the oxygenator module.

With prolonged use (>6 hrs.) the following performance factors may be impacted:

- Blood gas CO₂ levels continually increasing despite increasing sweep gas rates from the gas blender.
- Arterial pO₂ blood gas values decreasing despite clinician intervention of increasing FiO₂ values to 100% on the gas blender.
- System pressure changes. There is a trend of increasing oxygenator inlet pressure values due to formed components of the blood coating the hollow fiber, effectively reducing the blood flow pathway through the oxygenator. Depending upon the arterial pump method utilized the effects of blockage will be different.
 - The centrifugal pump will experience an increasing need for higher RPM to maintain a prescribed blood flow eventually resulting in the loss of pump flow support altogether.
 - The roller pump will continue to pump against the increasing resistance until the weakest part of the ECMO system separates to relieve the area of high pressure.
- Plasma leak associated with diminishing gas exchange performance as demonstrated by blood gas values.
- Loss of integrity within the blood, water, or gas pathways as evidenced by fluid leaking from the oxygenator module.
- Changes in arterial or venous oxygen saturation values independent of changes in blood flow rate, oxygen carrying capacity, systemic vascular resistance changes, level of consciousness, or metabolic demand.

In an extended use situation, the user should monitor performance closely. If gas transfer, pressure drop, or flow performance is impacted in a manner that cannot meet the needs of the patient or the user's performance expectations, oxygenator replacement should be considered.

In the event of plasma leakage (fluid/foam exiting the gas outlet port/vents), gas transfer functionality should be evaluated. If gas transfer is impacted in a manner that cannot meet the needs of the patient or the user's performance expectations, oxygenator replacement should be considered.

At all times, the oxygenator gas outlet port should be scavenged to a suction source, at a flow rate greater than the supplied gas flow, to protect the care team from the possibility of aerosolization of the COVID-19 virus should a plasma leak occur.

Device Change Out Instructions

Device change out instructions for the CAPIOX FX25 oxygenator are identical to what is listed in the product's Instructions for Use (IFU). As always, the change out procedure will be customized depending upon tubing circuit design and personal preference of the care team. Please maintain awareness of the important safety reminders:

CAUTIONS

- **After replacement, open recirculation and purge line for debubbling.**
- **Band and secure all connections in the circuit.**
- **Close recirculation and purge line prior to reinitiating cardiopulmonary bypass.**
- **While administering drugs within ECMO therapy, monitor the performance of the oxygenator closely, as performance of the oxygenator can be adversely affected.**
- **The method of monitoring blood / patient temperature should be conducted per the hospital protocol.**

If you have questions or would like to place an order for CAPIOX FX25 oxygenators, please contact:

Terumo Cardiovascular Customer Service at **800.521.2818**.
Customer Service Hours: Monday – Friday 8 a.m. – 6 p.m. ET

Terumo Cardiovascular Technical Support at **800.441.3220**
24-hour hot line

APPENDIX A

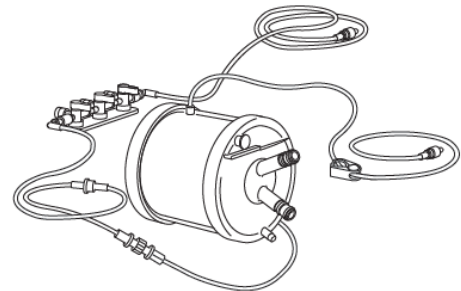
Applicable CAPIOX FX25 Oxygenator Devices:



REF: 3CX*FX25RWC
3ZZ*FX25RWCA



REF: 3CX*FX25REC
3ZZ*FX25RECA



REF: 1CX*FX25W
1CX*FX25E
3ZZ*FX25EA

Applicable CAPIOX FX25 Oxygenator Accessories:

<u>Part Number</u>	<u>Description</u>
801139	Holder for FX25 oxygenators with hardshell reservoir, short arm, gray
801804	Holder for FX25 oxygenators with hardshell reservoir, long arm, gray
1XX*CXH18R	Holder for FX25 oxygenators with hardshell reservoir, long arm
1XX*XH032	Holder for FX25 oxygenators with hardshell reservoir, short arm
1XX*CXH15	Holder for FX25 oxygenators
1XX*CXH18	Holder for FX25 oxygenators when separated from reservoir
1XX*CXH*25F	Holder for FX25 oxygenators when separated from reservoir
1CX*BP021	Thermistor wire, blue
1CX*BP022	Thermistor wire, red