$$\begin{array}{c|c}
\mathbf{C}_1 & \xrightarrow{f_1} & \mathbf{D}_1 \\
\hline
MonCat & & & \\
F \downarrow & \mathbf{MonCat} & & & \\
\mathbf{C}_2 & \xrightarrow{\mathbf{MonCat}} & & & \\
\mathbf{D}_2 & & & & \\
\end{array}$$