

Lemma. Given $\mathbf{d}_1, \mathbf{d}_2 \in \text{Hom}_{\mathbf{DP}}(\mathbf{P}; \mathbf{Q})$ and $\mathbf{e}_1, \mathbf{e}_2 \in \text{Hom}_{\mathbf{DP}}(\mathbf{R}; \mathbf{S})$, one has:

$$\frac{\mathbf{d}_1 \leq_{\mathbf{DP}} \mathbf{d}_2 \quad \mathbf{e}_1 \leq_{\mathbf{DP}} \mathbf{e}_2}{\mathbf{d}_1 \otimes \mathbf{e}_1 \leq_{\mathbf{DP}} \mathbf{d}_2 \otimes \mathbf{e}_2}$$

In other words, the monoidal product preserves order on \mathbf{DP} .