For independent comparison, the following is a notation-adjusted discovery by prof. Kaspar Riesen (h-index: 32) and prof. Horst Bunke (h-index: 96) published in 2009 having 737 citations as of September 2022

$$\rho_{(\text{Riesen, Bunke})}\left(G_1, G_2\right) \coloneqq \min_{f_{\mathrm{v}}:\left[|V_1|+|V_2|-1\right]_0 \leftrightarrow \left[|V_1|+|V_2|-1\right]_0} \sum_{v=0}^{|V_1|+|V_2|-1} c_{\text{vertex}}\left(\overline{\alpha}_1\left(v\right), \overline{\alpha}_2\left(f_{\mathrm{v}}(v)\right)\right) + \left(\min_{\substack{f_{\mathrm{u}}:\left[|V_1|+|V_2|-1\right]_0 \leftrightarrow \left[|V_1|+|V_2|-1\right]_0 \\ f_{\mathrm{u}}(v) \coloneqq f_{\mathrm{v}}(v) \text{ (optimization not specified in paper)}}} \sum_{u=0}^{|V_1|+|V_2|-1} c_{\text{edge}}\left(\overline{\beta}_1\left(v, u\right), \overline{\beta}_2\left(f_{\mathrm{v}}(v), f_{\mathrm{u}}(u)\right)\right) \right).$$

If $c_{\textbf{vertex}}$ and $c_{\textbf{edge}}$ are metric functions, $\rho_{\textbf{(Riesen, Bunke)}}$ becomes a special case of ρ:

$$\rho\left(G_1, G_2, P\right) \geq \rho\left(G_1, G_2, P, \varnothing\right) \geq \rho_{(\text{Riesen, Bunke})}\left(G_1, G_2\right)$$