Fabricable Template Database

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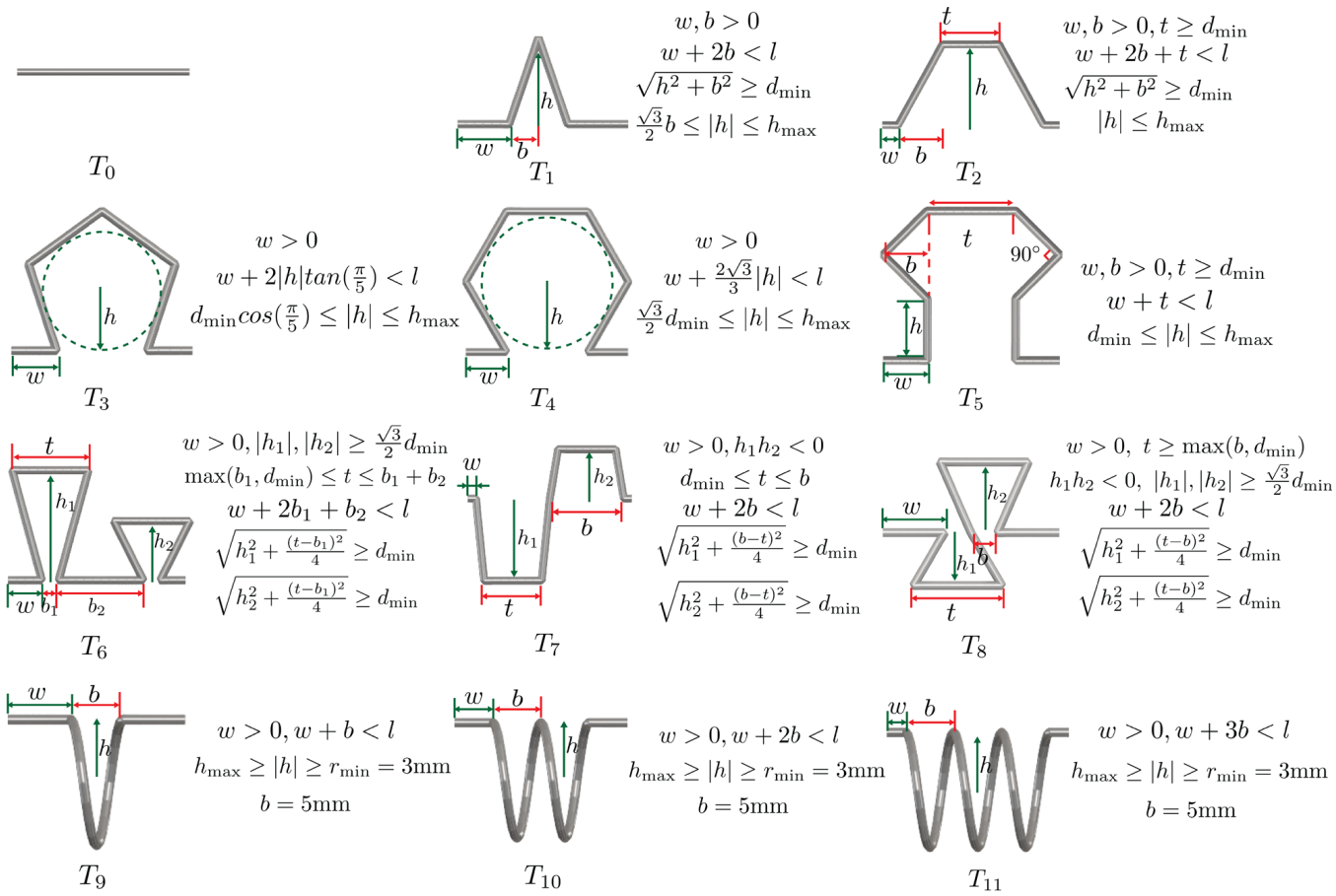

Fig. 1. **Fabrication constraints for fabricable template parameters.**

This document describes in detail the database of fabricable templates, including permissible ranges for the parameters such that fabrication constraints are satisfied.

In Fig. 1, we list the feasible ranges for parameters of our fabricable template. The ranges are defined by the two fabrication constraints: (1) the maximum bending angle $\alpha_{\max} = 120°$ and (2) the minimal feed length $d_{\min}$. All templates can rotate about their axis. We constrain the corresponding rotation parameter θ to the range $[-\pi, \pi]$. All our fabricable templates have constant length l. Parameters l, $h_{\max}$ and $d_{\min}$ are all positive and we list their values in Tab. 1 in the main text for all our demonstrations.

When we build the fabricable template database, we sample parameter domains uniformly, with one exception: we constrain the parameter θ to the two planar configurations $\theta = 0$ and $\theta = \pi$.

When we optimize the fabricable templates (Stage 3), red parameters remain fixed while we fine tune both the rotation parameter θ and the green parameters under the fabrication constraints. The proposed parameterization fulfills our requirements: the number of parameters is small, and simple box constraints are sufficient to keep their values within the feasible ranges.

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