Following is the table of materials that were able to be processed with good quality (no visible burr with the naked eyes) using the Nogamigiken Handheld Electrode Punches ( 4 um clearance).
The values in the table show the minimum to maximum thickness (in $\mu \mathrm{m}$ ) that can be processed for each punching diameter and each material.

| Punching size in diameter (mm) | Body size | Cathode electrode | Anode electrode | $\begin{gathered} \mathrm{Al} \\ (177 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \mathrm{Cu} \\ (443 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \text { SUS304 } \\ (1304 \mathrm{MPa}) \end{gathered}$ | $\underset{(785 \mathrm{MPa})}{\text { SUS316L }}$ | $\begin{gathered} \mathrm{Ni} \\ (685 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \mathrm{Ti} \\ (490 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \mathrm{Mo} \\ (635 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \mathrm{Ag} \\ (255 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \mathrm{Pt} \\ (150 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \mathrm{Au} \\ (130 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \text { PP } \\ (41 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \text { PE } \\ (31 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \mathrm{PI} \\ (247 \mathrm{MPa}) \end{gathered}$ | $\begin{gathered} \text { PET } \\ (178 \mathrm{MPa}) \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | S | 50 to 300 | 50 to 300 | 6 to 200 | 5 to 100 | 8 to 50 | 8 to 90 | 8 to 100 | 5 to 100 | 8 to 100 | 5 to 200 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 200 | 40 to 200 |
| 2 | S | 50 to 300 | 50 to 300 | 6 to 200 | 5 to 100 | 8 to 50 | 8 to 90 | 8 to 100 | 5 to 100 | 8 to 100 | 5 to 200 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 200 | 40 to 200 |
| 3 | S | 50 to 300 | 50 to 300 | 6 to 200 | 5 to 100 | 8 to 50 | 8 to 90 | 8 to 100 | 5 to 100 | 8 to 100 | 5 to 200 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 200 | 40 to 200 |
| 4 | S | 50 to 300 | 50 to 300 | 6 to 200 | 5 to 100 | 8 to 50 | 8 to 90 | 8 to 100 | 5 to 100 | 8 to 100 | 5 to 200 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 200 | 40 to 200 |
| 5 | S | 50 to 300 | 50 to 300 | 6 to 200 | 6 to 100 | 8 to 50 | 8 to 90 | 8 to 100 | 6 to 100 | 8 to 100 | 6 to 200 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 200 | 40 to 200 |
| 6 | M | 50 to 300 | 50 to 300 | 6 to 200 | 6 to 100 | 8 to 40 | 8 to 70 | 8 to 80 | 6 to 100 | 8 to 90 | 6 to 200 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 200 | 40 to 200 |
| 7 | M | 50 to 300 | 50 to 300 | 6 to 200 | 6 to 100 | 8 to 30 | 8 to 60 | 8 to 70 | 6 to 100 | 8 to 80 | 6 to 200 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 200 |
| 8 | M | 50 to 300 | 50 to 300 | 6 to 200 | 6 to 100 | 8 to 30 | 8 to 50 | 8 to 60 | 6 to 90 | 8 to 70 | 6 to 100 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 200 |
| 9 | M | 50 to 300 | 50 to 300 | 6 to 200 | 8 to 90 | 8 to 30 | 8 to 50 | 8 to 50 | 6 to 80 | 8 to 60 | 6 to 100 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 200 |
| 10 | M | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 80 | 8 to 20 | 8 to 40 | 8 to 50 | 8 to 70 | 8 to 50 | 8 to 100 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 200 |
| 11 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 80 | 8 to 20 | 8 to 40 | 8 to 50 | 8 to 70 | 8 to 60 | 8 to 100 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 200 |
| 12 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 80 | 8 to 20 | 8 to 40 | 8 to 50 | 8 to 70 | 8 to 50 | 8 to 100 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 13 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 70 | 8 to 20 | 8 to 40 | 8 to 40 | 8 to 60 | 8 to 50 | 8 to 100 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 14 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 20 | 8 to 30 | 8 to 40 | 8 to 60 | 8 to 40 | 8 to 100 | 6 to 200 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 15 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 20 | 8 to 30 | 8 to 40 | 8 to 50 | 8 to 40 | 8 to 100 | 6 to 100 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 16 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 20 | 8 to 30 | 8 to 30 | 8 to 50 | 8 to 40 | 8 to 100 | 6 to 100 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 17 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 10 | 8 to 30 | 8 to 30 | 8 to 50 | 8 to 30 | 8 to 90 | 6 to 100 | 6 to 100 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 18 | ML | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 10 | 8 to 30 | 8 to 30 | 8 to 40 | 8 to 30 | 8 to 90 | 6 to 100 | 6 to 100 | 40 to 200 | 40 to 200 | 40 to 90 | 40 to 100 |
| 19 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 20 | 8 to 30 | 8 to 40 | 8 to 60 | 8 to 40 | 8 to 100 | 6 to 100 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 20 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 20 | 8 to 30 | 8 to 40 | 8 to 50 | 8 to 40 | 8 to 100 | 6 to 100 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 21 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 60 | 8 to 20 | 8 to 30 | 8 to 30 | 8 to 50 | 8 to 40 | 8 to 100 | 6 to 100 | 6 to 200 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 22 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 50 | 8 to 10 | 8 to 30 | 8 to 30 | 8 to 50 | 8 to 40 | 8 to 100 | 6 to 100 | 6 to 100 | 40 to 200 | 40 to 200 | 40 to 100 | 40 to 100 |
| 23 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 50 | 8 to 10 | 8 to 30 | 8 to 30 | 8 to 50 | 8 to 30 | 8 to 90 | 6 to 100 | 6 to 100 | 40 to 200 | 40 to 200 | 40 to 90 | 40 to 100 |
| 24 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 50 | 8 to 10 | 8 to 30 | 8 to 30 | 8 to 40 | 8 to 30 | 8 to 90 | 6 to 100 | 6 to 100 | 40 to 200 | 40 to 200 | 40 to 90 | 40 to 100 |
| 25 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 50 | 8 to 10 | 8 to 20 | 8 to 30 | 8 to 40 | 8 to 30 | 8 to 80 | 6 to 100 | 6 to 100 | 40 to 200 | 40 to 200 | 40 to 90 | 40 to 100 |
| 26 | L | 50 to 300 | 50 to 300 | 6 to 100 | 8 to 40 | 8 to 10 | 8 to 20 | 8 to 30 | 8 to 40 | 8 to 30 | 8 to 80 | 6 to 100 | 6 to 100 | 40 to 200 | 40 to 200 | 40 to 80 | 40 to 100 |

