



Metal Stamping & CNC Fabrication



Tripar CNC Punch/Laser Capabilities & Design Guide

March, 2018



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1. Introduction

In November 2017 Tripar became the first company in Canada to purchase the brand new Trumpf Trumatic 1000 Punch/Laser combination machine, propelling our CNC capabilities to the forefront of the industry. With close to 70 years' experience, Tripar is the largest stamped metal components manufacturer in the lighting industry, also serving a diverse range of other industries.

Our foundation is based on metal stamping; notably progressive stamping, and drawing & deep drawing, capitalizing on our inventory of over 1,600 dies and over 100 state-of-the-art presses (up to 200 tons). Over the last 15 years Tripar has invested in a range of additional metal fabrication equipment including an Amada CNC laser, CNC press breaks, a multitude of PEM insertion machines, spot welders, and now this state-of-the-art CNC workhorse.

Tripar continually strives to employ the best practices so that we can offer our clients optimal quality, design assistance, manufacturing, and delivery, all at competitive prices to allow OEM's the best chances to succeed in highly competitive markets. As such, this new CNC Punch/Laser combination machine augments Tripar's sophisticated metal stamping and fabrication solutions. Capitalize on either:

- **Metal Stamping:** Using our extensive metal stamping capabilities and existing tooling, or new tooling produced in our toolroom.
- **Fabrication:** Using our various CNC and related equipment, including our new CNC Punch/Laser combination machine, which offers a huge range of design possibilities by using the extensive range of available tooling.

This unique combination allows Tripar to manufacture a range of highly complex components, from prototypes & small quantity runs, to mass production of multimillion pieces per year.

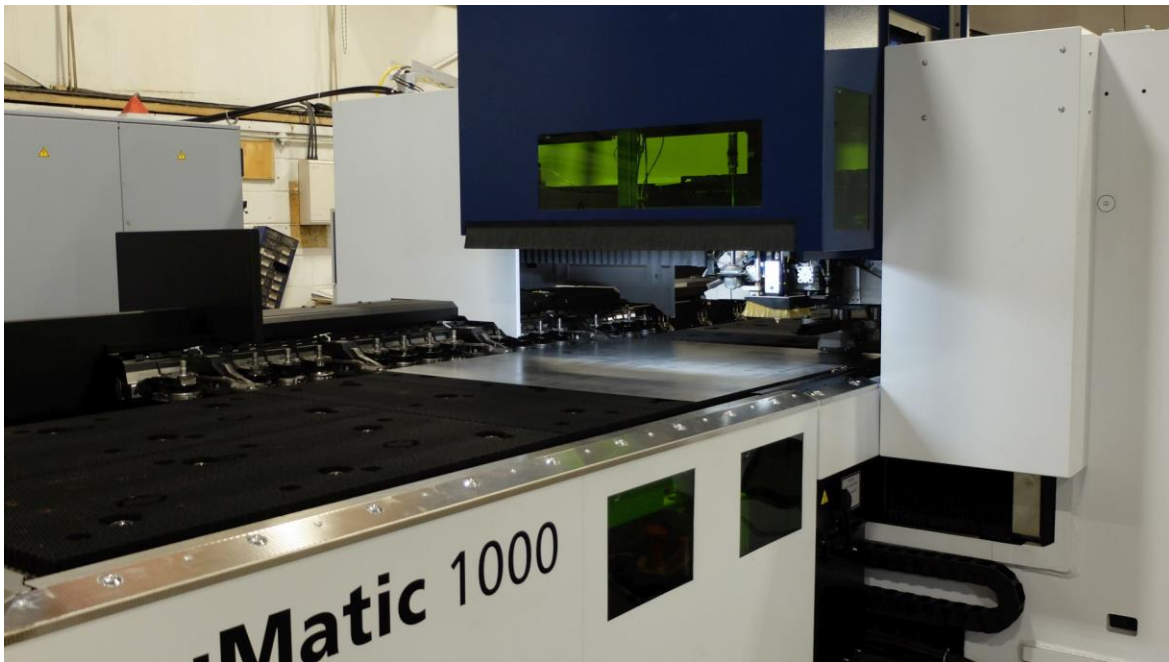
Lastly, and to further reduce costs, we strongly encourage you to contact us for any of the following design features that you are considering incorporating, so that we may tell you the standard sizes available.

2. Welcome to Tripar's CNC Punch/Laser machine

Manufacturing complex parts often requires costly tooling or successive fabrication processes, the combination of which can be very time-consuming & costly. Such components can best be efficiently produced by means of complete processing wherever possible, meaning they are fabricated in one (clamping) operation. This considerably reduces the total processing time & cost.

CNC Punch/Laser combination machines are optimally suited for the complete processing of workpieces, since many features can be achieved in a single operation; punching, laser cutting, tapping, forming, bending, extruding, marking of components, and more!

Discover on the following pages, all the design and manufacturing possibilities of complete processing with punching tools on our CNC Punch/Laser combination machine.



3. CNC Laser Capabilities

The laser cutting head within our CNC Punch/Laser Combination machine offers the ultimate in cutting flexibility.

- **Shape:** Almost any shape can be cut, and with exceptionally fine detail; see Photo 1: < 2" diameter, containing 0.05" wide notches.
- **Tooling:** Intricate & irregular shape with zero tooling required; see Photo 2: < 1 in².
- **Edge Quality:** A finer and burr-free cut edge can be achieved with laser cutting; see Photo 3: 0.075" thick, #4 brush finished stainless steel; laser cut outer edge, interior holes punched.
- **Continuous Cutting:** Eliminates small nodules that come with nibbling from punching; see Photos 1-3.
- **Detail:** Cuts as fine as the laser beam width are possible; as low as 0.012", depending on material thickness; see Photo 4: 0.012" wide laser perf-cut lines to permit hand bending.
- **Marking:** Laser engraving is possible in order to mark the part or apply other graphical information, without punches, and not limited to punch size.



Photo 1



Photo 2



Photo 3

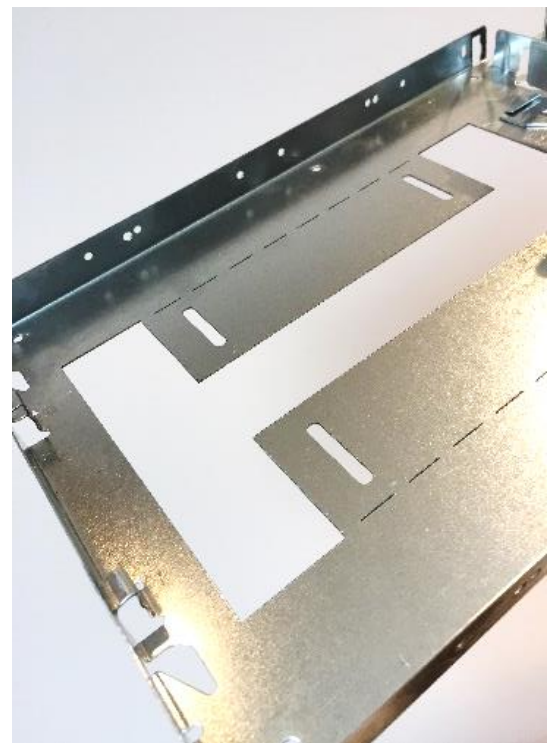


Photo 4

When a feature can either be punched or laser cut, generally speaking, punching will cost less, However, this is dependent on whether the punching tool is available, and if not, if the purchase of the tool (albeit often low), can be justified given the lot sizes required

4. CNC Punch Capabilities

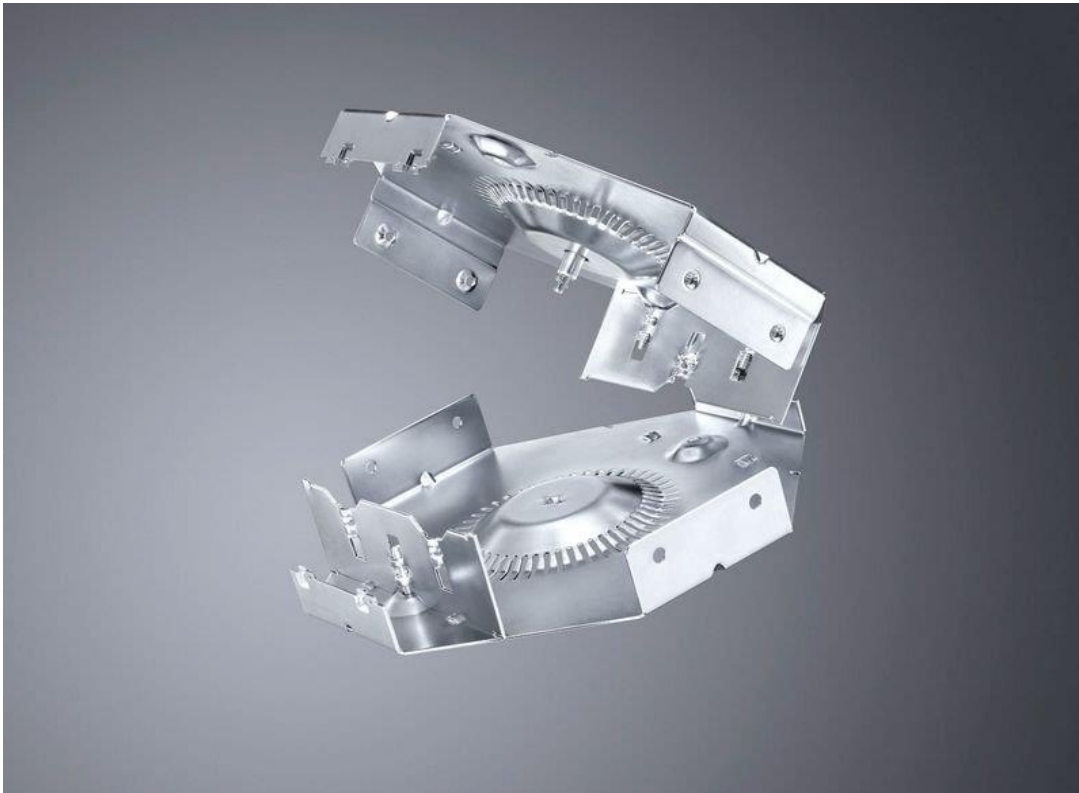
The punching head within our CNC Punch/Laser Combination machine offers extensive possibilities. These not only include classic hole punching and blanking, but also tapping, forming, bending, extruding, marking of components, and more. Some of these techniques require tooling, but many can be realized using standard CNC punch tooling, not only on bare metal, but often using many prefinished materials, such as pre-painted and pre-plated.

The punching techniques that follow offer a wealth of design ideas, all of which can be performed on our machine.

5. Joining techniques

In many cases, components consist of several sheet metal parts, which only completely fulfill their function together. To join sheet metal parts together, there are various joining processes available, where, in addition to quality, economic aspects also play an important role.

Mechanical joining processes are less expensive than thermal processes while still providing the same strength – therefore, screw joints are often the top choice. If these are realized with punching tools, entire working steps might even be able to be eliminated. For example, you can replace rivets with simple clip connections and weld nuts with extrusions, which contain formed threads. On the next pages you will find suitable joining techniques for your application.



Sample sheet, joining techniques

1. Flange, locking	2. Flange w/ weld dimple	3. Flange and locking tab	4. Flange, multiple
			
5. Thread bridge, self tapping	6. Thread bridge, sheet-metal screw	7. Bridge, lance & form	8. Bridge, lance & form locking
			
9. Half-hinge	10. Hinge	11. Extrusion with tapping	12. Sheet-metal screw thread
			

Contact us for any technique(s) you are considering, so we can advise you of the standard sizes available

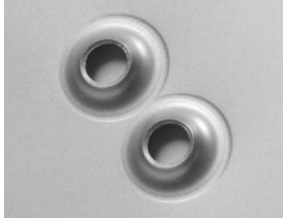

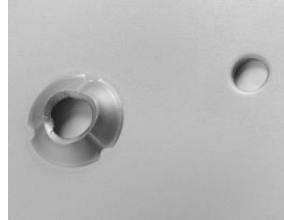
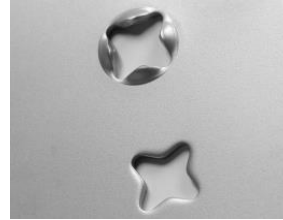




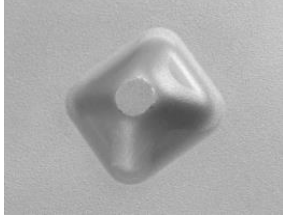

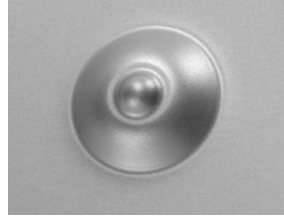
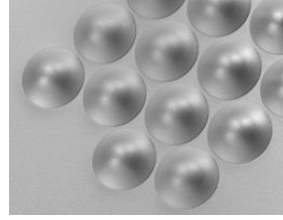
6. Tread plates

This punching form is mainly used when the goal is to make surfaces, which were nearly smooth originally, slip-proof with a modified surface structure. Tread plates have an anti-slip effect and are therefore an indispensable element, especially in vehicle and machine construction. Thanks to the versatile options with regard to form and size, tread plates are also used as a decorative component in room furnishings.

In order to meet the different requirements of the respective areas of application, we offer a variety of solutions – from simple, prepunched contours, which might be used in water regulation, to complex special formed sections, which have a dirt-repelling effect thanks to their jagged structure. Below, you will find an overview of the most commonly used tread plate applications.



Tread plate with serrated countersink

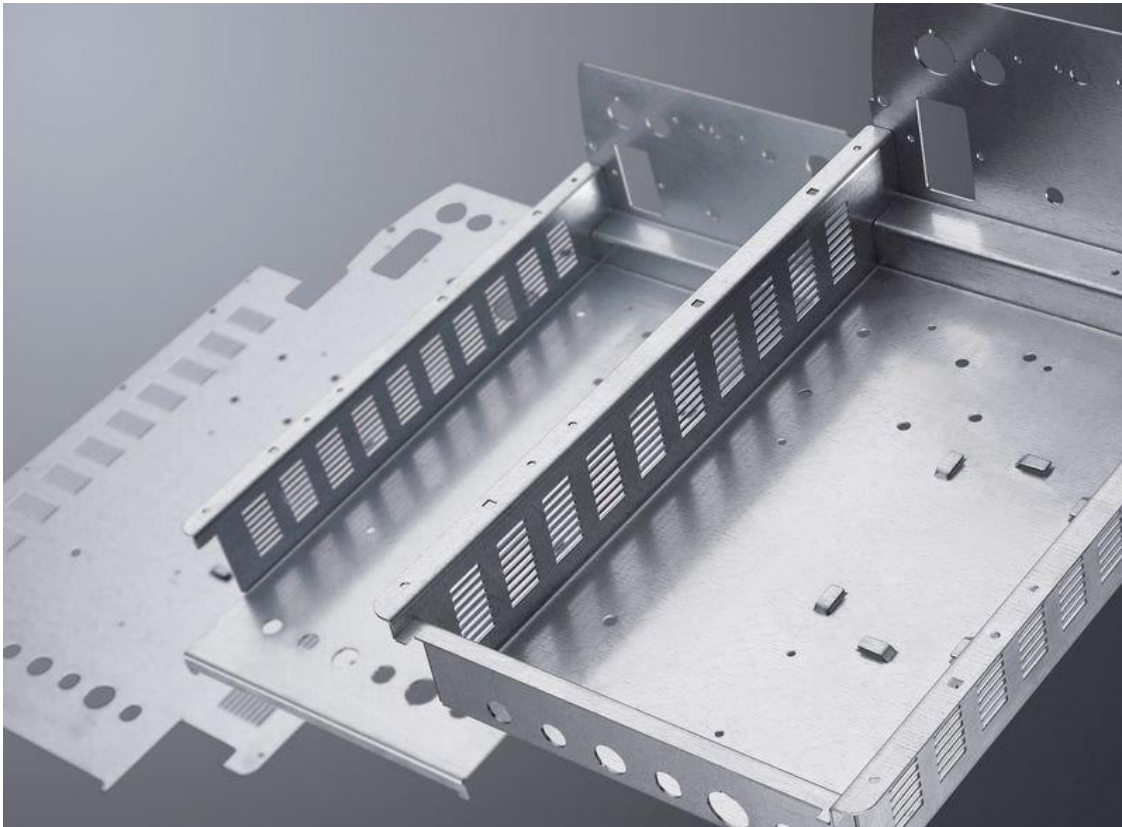
1. Emboss, round	2. Emboss, shaped	3. Emboss, reinforced	4. Emboss, serrated
			
5. Forming, serrated	6. Extrusion	7. Shear Tab, teardrop1	8. Tread form, emboss
			
9. Emboss, square	10. Dimple with shear tab	11. Emboss with dimple	12. Dimple, multiple
			

Contact us for any technique(s) you are considering, so we can advise you of the standard sizes available

7. Housings

In industrial surroundings, housings are used, for example, to protect sensitive electric and electronic components from dirt, water or pressure. Housings not only safeguard the functionality of all components inside, however, but also play an important role as a structural part, since they are often further installed.

With punching tools, you can manufacture sturdy housings, which both ensure optimal protection of your components as well as provide attachment points for the installation of cables and other components. On the following pages, you will certainly find the right punching tool which can be used to realize a housing which meets your specifications.



Electronics housing

1. Bridge, double	2. Card guide	3. Extrusion, eyelit	4. Multiple punching
			
5. Knock-out, form	6. Knock-out, double	7. Flange, contact	8. Flange, ventilation
			
9. Emboss with extrusion upward	10. Louver	11. Beading	12. Embossing, symbol
			

Contact us for any technique(s) you are considering, so we can advise you of the standard sizes available


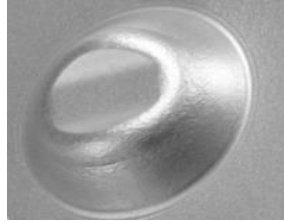

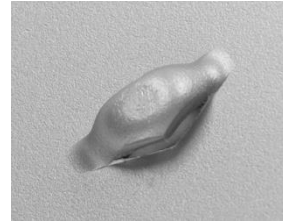

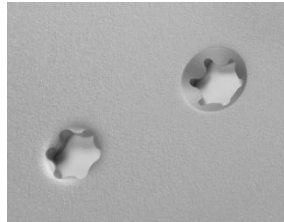
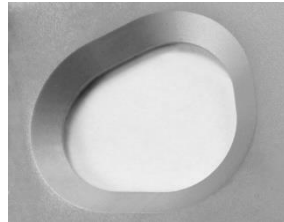
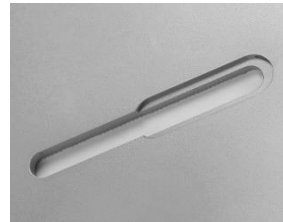
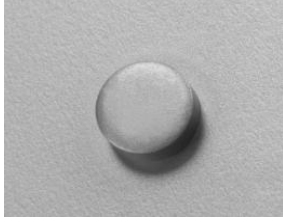
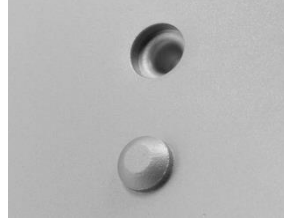
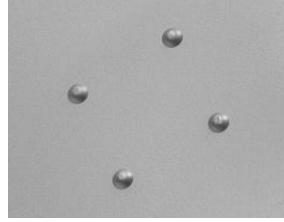
8. Fittings

Building fittings mainly serve for the introduction and transfer of forces, for example as window handles or in door-locking systems. Depending on the application, different types of fittings can be distinguished: turn and tilt fittings and shutter fittings. Furthermore, fittings can lend pieces of furniture a specific character as an ornamental element in the form of a flange, a key plate or a drawer guide.

The versatile applications of fittings are also reflected in our punching tools. Here, you will find both tools which can be used to join your components with one another, as well as tools with which you can bring forms, such as attachment points or spacers, into the sheet.



Door fitting

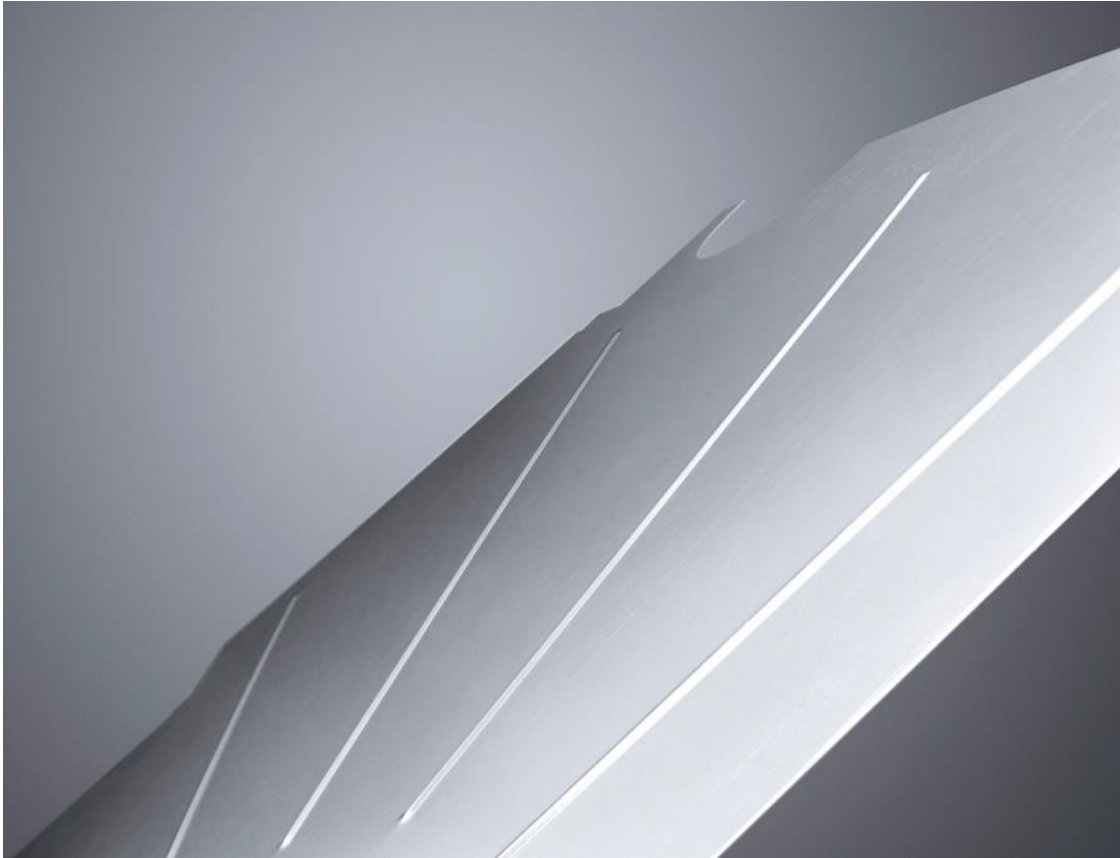
1. Emboss	2. Emboss, special	3. Bridge, arched	4. Bridge, shaped
			
5. Extrusion with thread	6. Countersink, with shape	7. Countersink, shape	8. Counter bore, flat
			
9. Shear tab	10. Center boss upward & downward	11. Weld dimple	12. Flange
			

Contact us for any technique(s) you are considering, so we can advise you of the standard sizes available


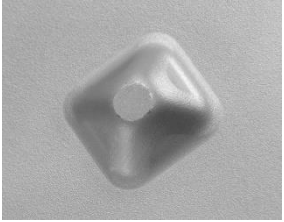
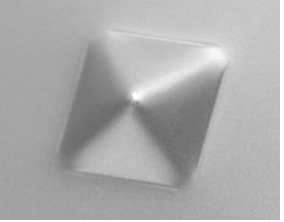
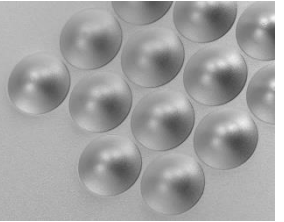
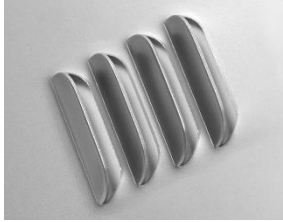
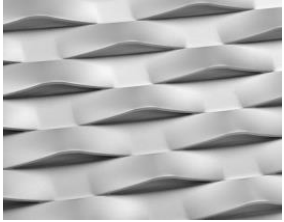
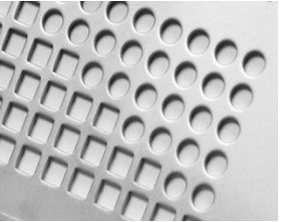
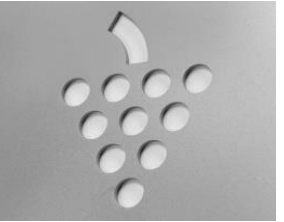
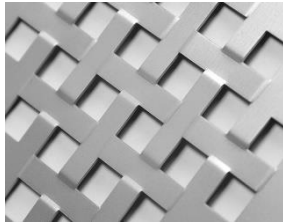
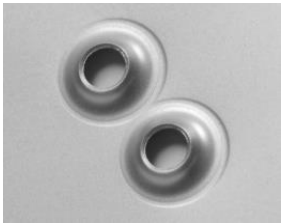

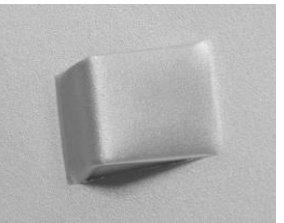
9. Trim panels

Trim panels are mainly used in the building industry. Here, they mainly fulfill important functions, such as energy regulation. Often, special trim panels are also used, however, to turn buildings into real eyecatchers. Complex forms and contours are also found as design elements on external facades.

There are a variety of punching tools available for implementing such applications. We would also be happy to help you realize your individual ideas and conceptions – so that your trim panel meets all requirements with regard to function and design.



Facade element

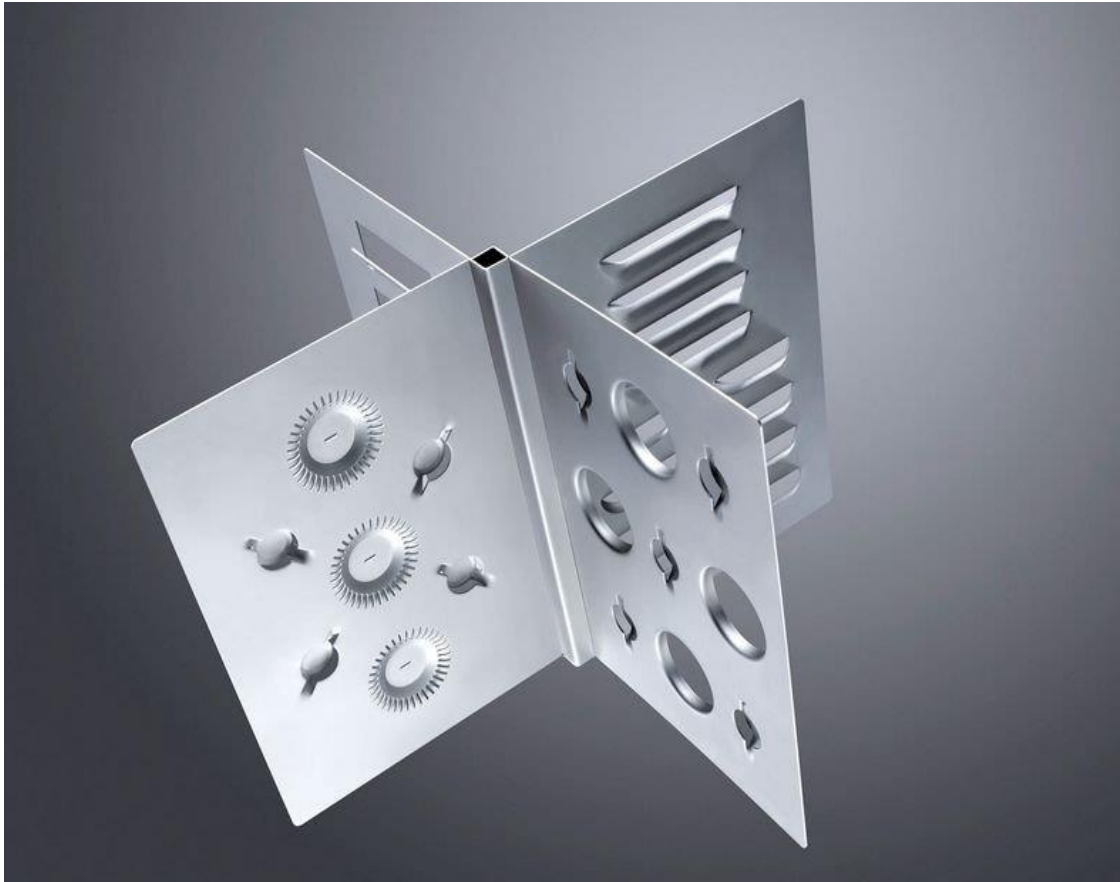
1. Emboss, round	2. Emboss, shape	3. Emboss, shape	4. Dimple, multiple
			
5. Louver	6. Louver	7. Perforation, multiple	8. Perforation, multiple
			
9. Lattice/ Weave form	10. Countersink emboss	11. Bridge form	12. Lance form shape
			

Contact us for any technique(s) you are considering, so we can advise you of the standard sizes available

10. Other special forms

Independent of the actual application, punching technology offers countless processing options, even for very special requirements. The louvers shown in this chapter, for example, are used both in ventilation technology and as design elements. Likewise, the embosses listed here not only function as step protection, but can also act as spacers.

This chapter offers some interesting insights into the nearly endless possibilities of form design with punching technology. The shown special forms should inspire you to develop your own solutions for specific applications.






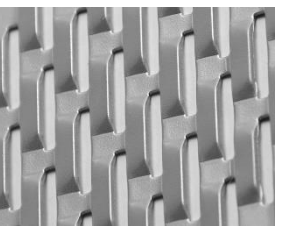
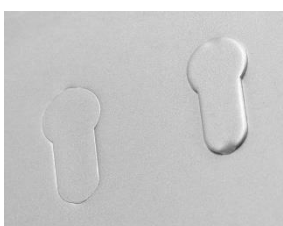



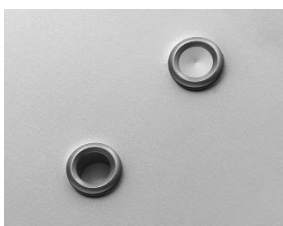

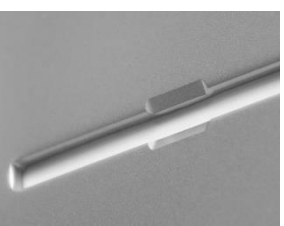
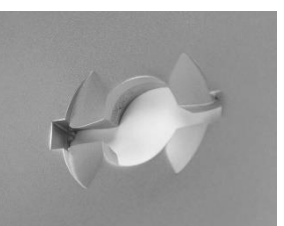
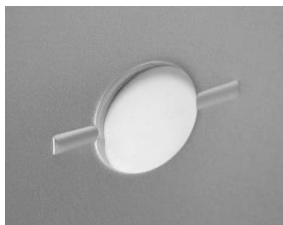
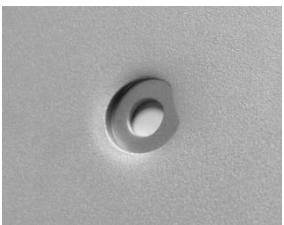
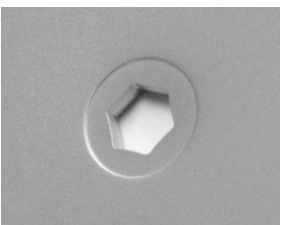
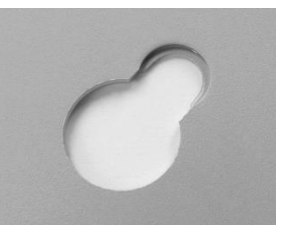
Sample sheet, tools size 5

1. Flange	2. Offset, form	3. Offset, form	4. Lance & Form, shape
			
5. Flange, offset	6. Flange, shape	7. Coined, flange	8. Lance, contact
			
9. Coined, contact	10. Offset, wave	11. Clip, rigid	12. Clip, rigid
			
13. Flange, curved	14. Flange with emboss	15. Flange with lance	16. Flange with offsets
			


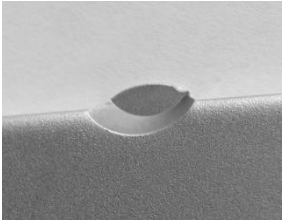
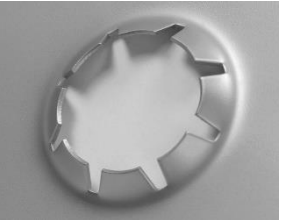
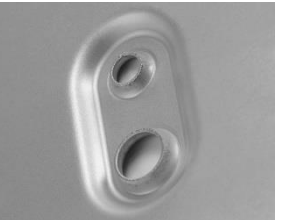
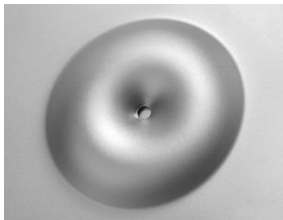
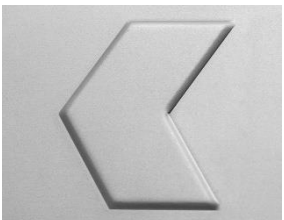

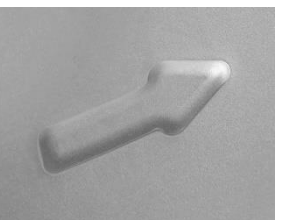






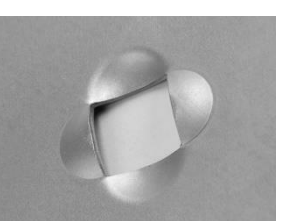
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17. Flange, fan with emboss	18. Flange, double	19. Clip, shaped	20. Offset, double
			
21. Offset, double	22. Offsets, multiple	23. Lance, multiple	24. Clip, multiple
			
25. Flange, multiple	26. Flange, multiple	27. Lance, multiple	28. Flange, multiple
			
29. Louver	30. Emboss, precut	31. Louver	32. Bridge, form
			

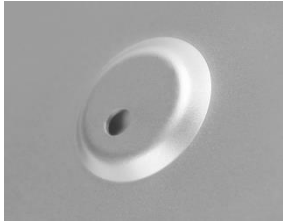
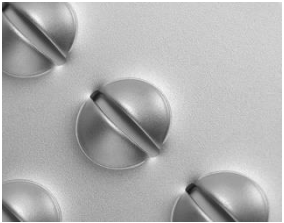



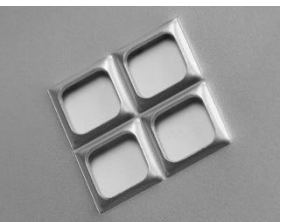
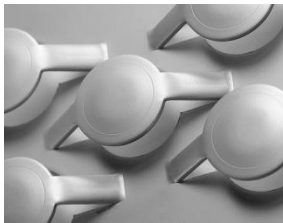
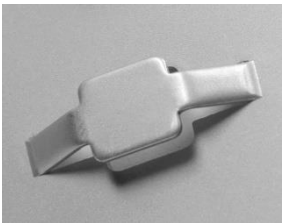
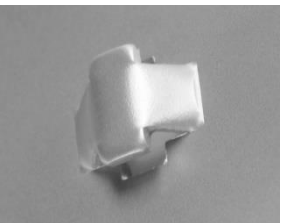

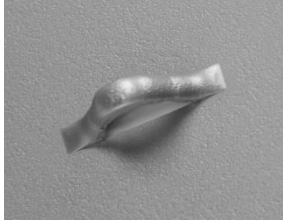
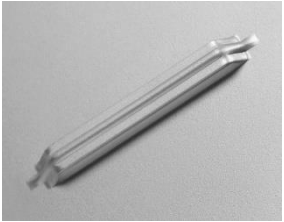

Contact us for any technique(s) you are considering, so we can advise you of the standard sizes available

33. Louver with bridge	34. Small part with louvers	35. Louver, continuous	36. Louver, multiple
			
37. Knock-out, shaped	38. Knock-out, square	39. Knock-out, double	40. Shear tab, square
			
41. Center boss with post punching	42. Emboss, shaped	43. Coining, chamfer	44. Coining, shaped
			
45. Coin, shape	46. Coin, emboss	47. Coin, flat	48. Coin, shape
			

Turn page to continue viewing this section....

49. Counter bore, flat	50. Countersink, flat	51. Emboss, slotted	52. Emboss with extrusion
			
53. Emboss, shaped	54. Emboss, shape	55. Emboss, shaped	56. Emboss, shaped
			
57. Emboss, shape	58. Emboss, shape	59. Emboss, shape	60. Emboss, shape
			
61. Emboss, multi-hit	62. Emboss, with lance	63. Emboss, rib	64. Emboss, shape
			

Contact us for any technique(s) you are considering, so we can advise you of the standard sizes available

65. Emboss, with post-punch	66. Emboss , with pre-punch	67. Emboss with extrusion upward	68. Emboss with countersink
			
69. Emboss with shape	70. Emboss, double	71. Emboss, multiple	72. Small part with emboss
			
73. Bridge, lance	74. Bridge, lance	75. Bridge, lance	76. Bridge form
			
77. Bridge, lance	78. Bridge, lance with reinforcing	79. Bridge with sheet metal thread	80. Bridge with dimple
			

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81. Bridge, upward and downward	82. Bridge, upward and downward	83. Bridge, double	84. Bridge, multiple
			
85. Bridge, multiple	86. Beading, shape	87. Beading, corner	88. Beading, cross
			
89. Offset, multi-hit	90. Offset, progressive	91. Stamping, scale	92. Embossing, special
			
93. Small part with stamping	94. Extrusion, shape	95. Extrusion, shape	96. Folding, eyelet
			

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12. Contact Details

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