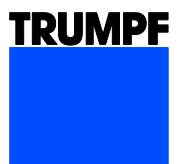


TruServices  
Punching Tools

Application  
Catalog

Know-how for every application

Machine Tools/Power Tools  
Laser Technology/Electronics  
Medical Technology





---

## Preface

Particularly sophisticated machining problems can often no longer be solved with standard tools. Rather, the manufacturing of highly complex components in shorter and shorter amounts of time require special tools.

Together with our customers, we here at TRUMPF face this challenge every day.

Here, you will profit from over 40 years of punching know-how, the widest range of tools on the market worldwide and our aspiration to also find intelligent solutions for new challenges.

We have compiled the most common applications for special punching tools for you in this catalog. From components which are completely machined on punching or punching and laser cutting machines and universally applicable joining techniques to special individual applications, such as tread plates or housings. Discover the variety of punching applications.

And if there should not be a solution for your problem, we will individually develop tailor-made special tools exactly according to your specifications. Regardless of whether or not your application can be realized with conventional steel, stainless steel or aluminum, our experts have the right experience in the area of non-metallic materials.

Thanks to our own in-house production and intensive tool testing on TRUMPF machines, we meet the toughest quality demands. Thanks to the availability of all necessary tool data, we also make sure that your tools are quickly ready to use.

We offer you the optimum conditions for the development and production of your own special tools.  
Let yourself be inspired by this application catalog!

**TruServices Punching Tools: Know-how for every application**



---

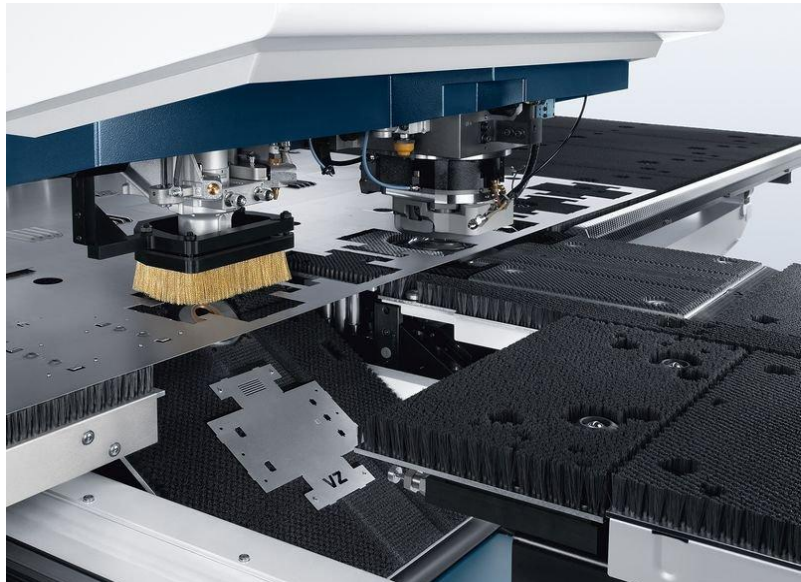
# Table of contents

Preface .....	3
1 Complete processing.....	5
2 Joining techniques .....	8
3 Tread plates.....	10
4 Housings .....	12
5 Fittings .....	14
6 Trim panels .....	16
7 Other special forms .....	18
Order form.....	26

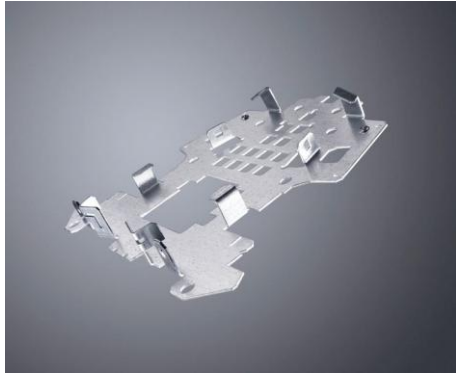
## 1 Complete processing

In order to manufacture complex workpieces, often different, successive machining processes are required, which can be very time-consuming. Such components can therefore usually only be efficiently realized by means of complete processing, which means they are machined in one clamping operation. This considerably reduces the total processing time.

Punching or punching and laser cutting machines are optimally suited for the complete processing of workpieces, since several applications can be linked together: punching, tapping, forming, bending and marking of components. On the following pages, discover the possibilities of complete processing with punching tools on punching and punching and laser cutting machines.



TruMatic 6000 in action



**Component of an automatic machine**

Manufactured on a TruPunch 1000 with the "MultiBend" machine option

Used tools:

- Extrusion tool upward
- Cluster tool
- MultiBend
- Special punching tool



**Technological component, tools size 5**

Manufactured on a TruPunch 5000 with the "active die" and the "roller technology" machine options

Used tools:

- Extrusion tool size 5
- Card guide tool size 5
- Louver tool size 5
- Roller offsetting tool
- Countersink form, oblong



**Housing component**

Manufactured on a TruMatic 7000 with the "active die", the "MultiBend" and the "roller technology" machine options

Used tools:

- Extrusion tool downward
- Cluster tool
- MultiBend
- Roller offsetting tool
- Roller beading tool
- Countersink form, round



**Lamp holder**

Manufactured on a TruPunch 5000 with the "roller technology" machine option

Used tools:

- Extrusion tool size 5
- MultiBend
- Roller offsetting tool



#### Technological component, embossing forming tools

Manufactured on a TruPunch 5000 with the "roller technology" machine option

Used tools:

- Bridge tool size 5
- Extrusion tool downward
- Cluster tool
- Cup tool
- Embossing tool – symbol (upper side of the sheet)
- Roller offsetting tool

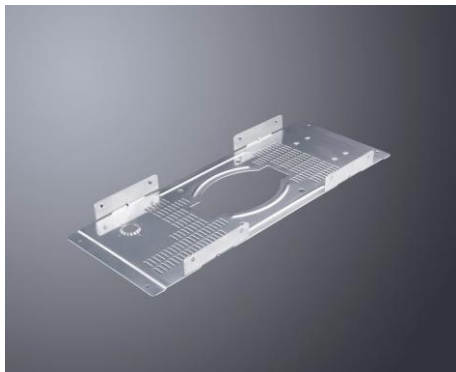


#### Component in machine construction

Manufactured on a TruMatic 6000 with the "tapping" and the "roller technology" machine options

Used tools:

- Tapping tool
- Cup tool, rectangle
- Cup tool, round
- Special stepping tool

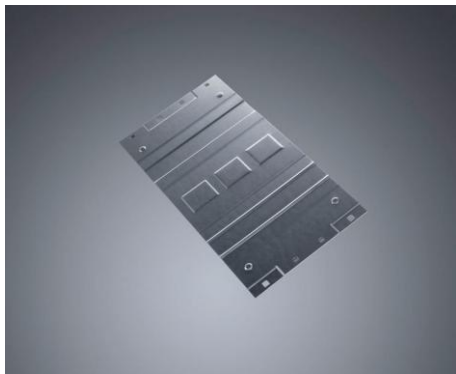


#### Cover sheet

Manufactured on a TruMatic 3000 with "tapping", "MultiBend" and "roller technology" options

Used tools:

- Stepping tool
- Extrusion tool upward
- Tapping tool
- Cluster tool
- MultiBend with reinforcing bead
- Roller beading tool
- Countersink form, round



#### Technological component, roller tools

Manufactured on a TruPunch 1000 with the "roller technology" machine option

Used tools:

- Stepping tool
- Bracket tool
- Cup tool, rectangle
- Cup tool, round
- Roller offsetting tool
- Roller pinching tool

---

## 2 Joining techniques

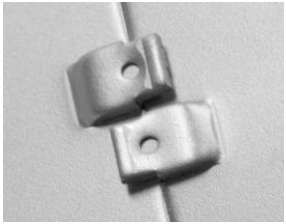
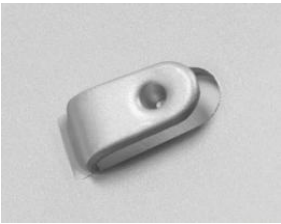





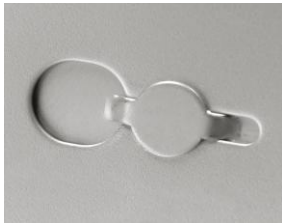


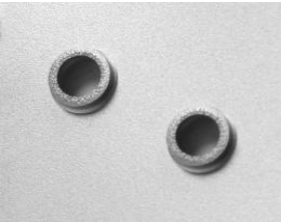

In many cases, components consist of several sheet metal parts, which only completely fulfill their function together. To join sheet metal parts together, there are various joining processes available, where, in addition to quality, economic aspects also play an important role.

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



<p><b>1. Flange, perforated</b></p>	<p><b>2. Flange with weld boss</b></p>	<p><b>3. Flange and louver</b></p>	<p><b>4. Flange, multiple</b></p>
			
<p><b>5. Thread bridge, metric</b></p>	<p><b>6. Thread bridge, sheet-metal screw</b></p>	<p><b>7. Bridge, form</b></p>	<p><b>8. Bridge, form</b></p>
			
<p><b>9. Half-hinge</b></p>	<p><b>10. Hinge</b></p>	<p><b>11. Extrusion with tapping</b></p>	<p><b>12. Sheet-metal thread</b></p>
			

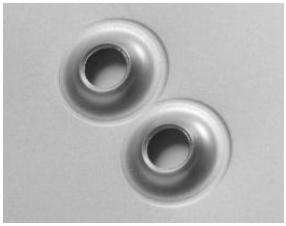

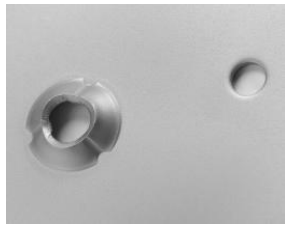
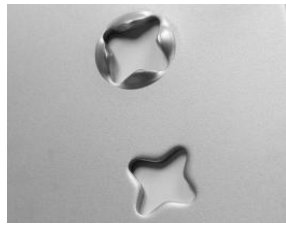


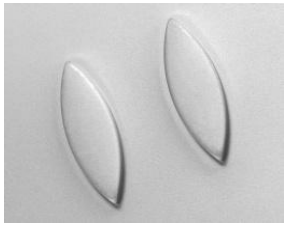

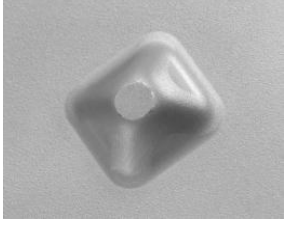

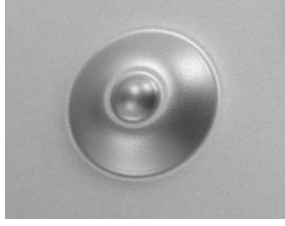

### 3 Tread plates

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, pre-punched 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

<b>1. Countersink</b>	<b>2. Countersink, hexagonal</b>	<b>3. Countersink, reinforced</b>	<b>4. Countersink, serrated</b>
			
<b>5. Countersink, serrated</b>	<b>6. Extrusion</b>	<b>7. Center boss, teardrop<sup>1</sup></b>	<b>8. Beading</b>
			
<b>9. Cup, square</b>	<b>10. Cup with center boss</b>	<b>11. Cup with weld boss</b>	<b>12. Cup, multiple</b>
			

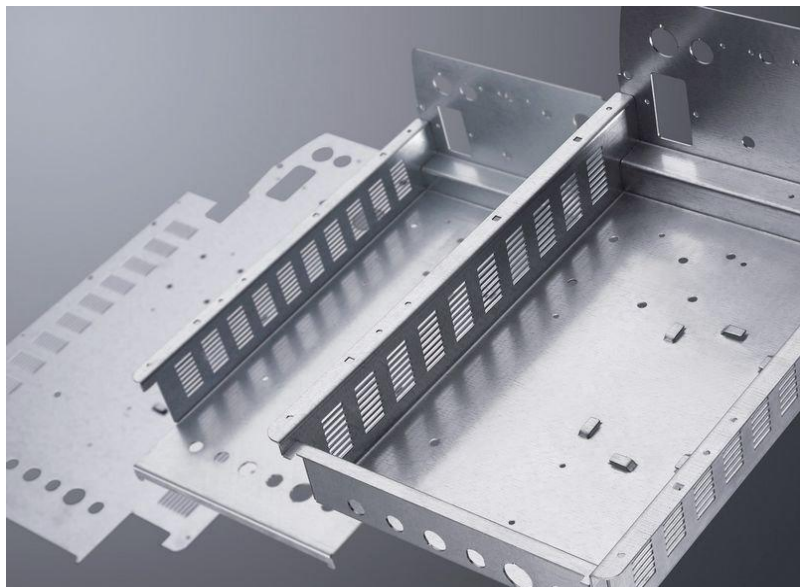
<sup>1</sup> Patented in acc. with DE102008048991B4

---

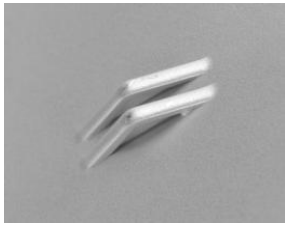
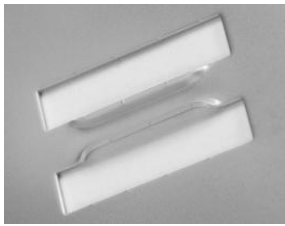










## 4 Housings

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

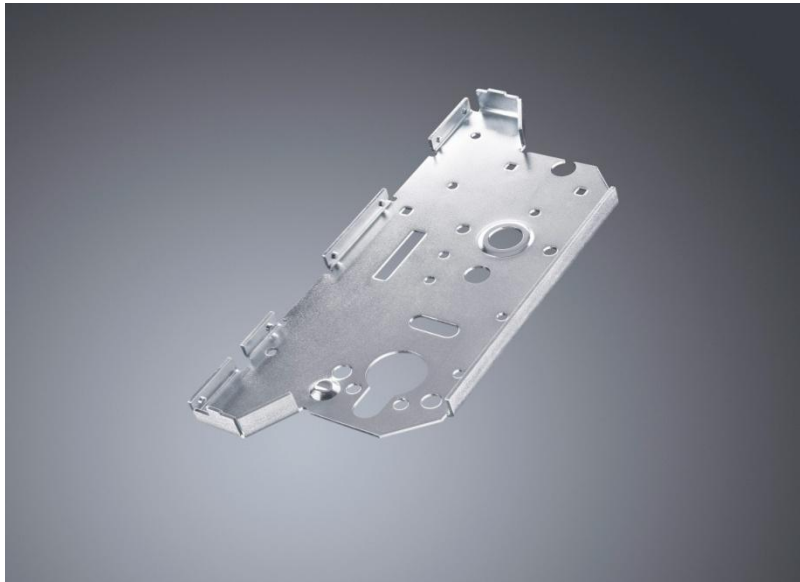
<p><b>1. Bridge, double</b></p>	<p><b>2. Card guide</b></p>	<p><b>3. Extrusion, folded</b></p>	<p><b>4. Multiple punching</b></p>
			
<p><b>5. Knock-out, form</b></p>	<p><b>6. Knock-out, double</b></p>	<p><b>7. Flange, contact</b></p>	<p><b>8. Flange, ventilation</b></p>
			
<p><b>9. Cup with extrusion upward</b></p>	<p><b>10. Louver</b></p>	<p><b>11. Beading</b></p>	<p><b>12. Embossing, symbol</b></p>
			

---


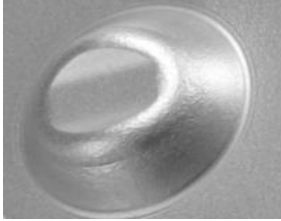


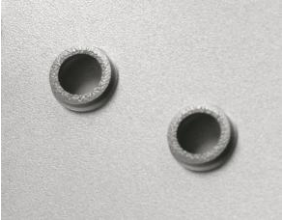

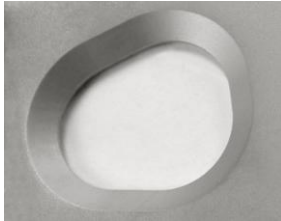
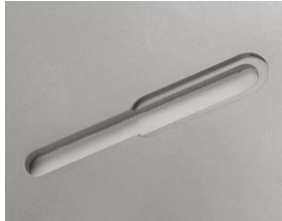
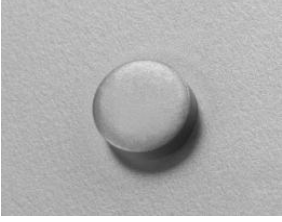
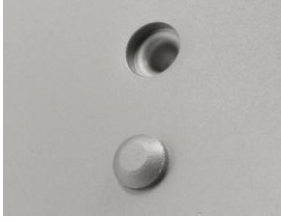
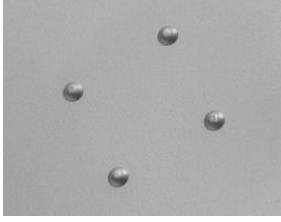

## 5 Fittings

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 flap, 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

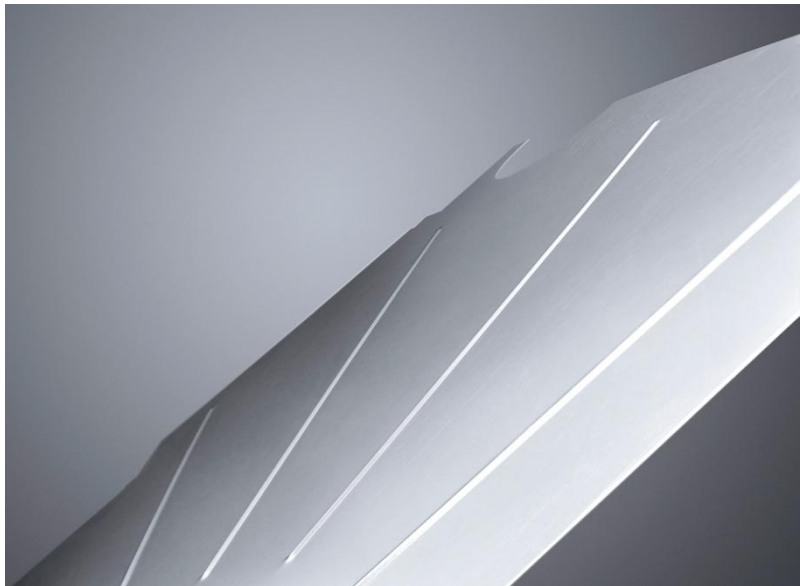
<p><b>1. Cup</b></p>	<p><b>2. Cup, form</b></p>	<p><b>3. Bridge, round</b></p>	<p><b>4. Bridge, form</b></p>
			
<p><b>5. Extrusion with thread</b></p>	<p><b>6. Countersink, form</b></p>	<p><b>7. Countersink, form</b></p>	<p><b>8. Countersink, flat</b></p>
			
<p><b>9. Center boss</b></p>	<p><b>10. Center boss upward and downward</b></p>	<p><b>11. Weld boss</b></p>	<p><b>12. Flange</b></p>
			

---

## 6 Trim panels


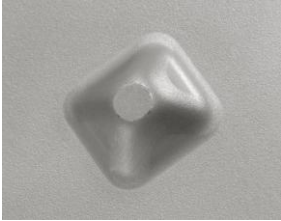
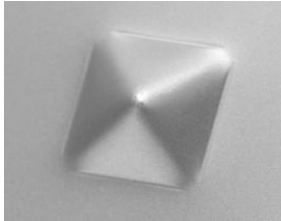
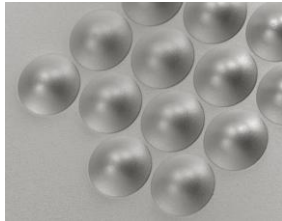

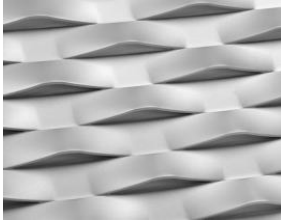
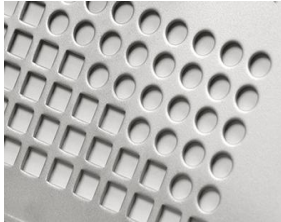

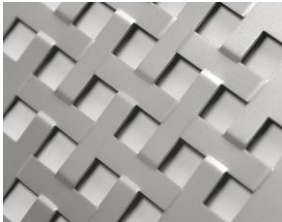
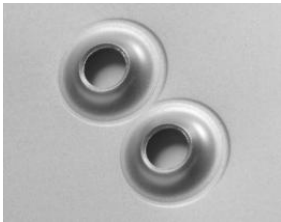

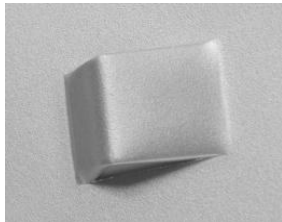
Trim panels are mainly used in the building industry. Here, they mainly fulfill important functions, such as energy regulation. Often, special trim panels are also used, however, to turn buildings into real eyecatchers. Complex forms and contours are also found as design elements on external facades.

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

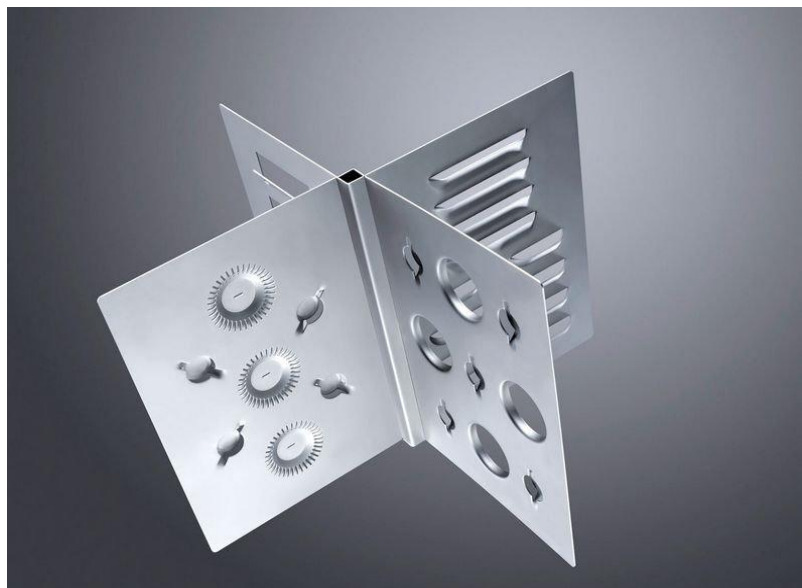


<p>1. Cup, form</p>	<p>2. Cup, form</p>	<p>3. Cup, form</p>	<p>4. Cup, multiple</p>
			
<p>5. Louver</p>	<p>6. Louver</p>	<p>7. Perforation, multiple</p>	<p>8. Perforation, multiple</p>
			
<p>9. Latticework</p>	<p>10. Countersink</p>	<p>11. Bridge</p>	<p>12. Bridge</p>
			





## 7 Other special forms

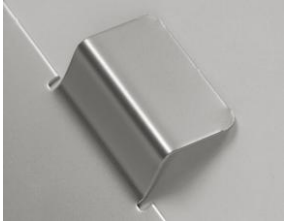
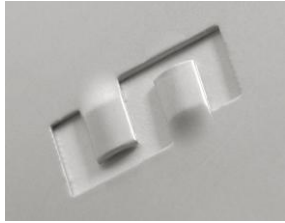
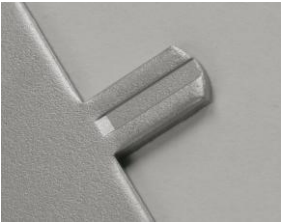
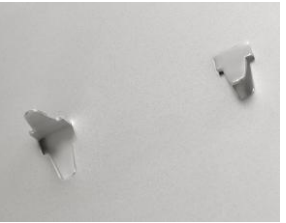
Independent of the actual application, punching technology offers countless processing options, even for very special requirements. The louvers shown in this chapter, for example, are used both in ventilation technology and as design elements. Likewise, the cups listed here not only function as step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

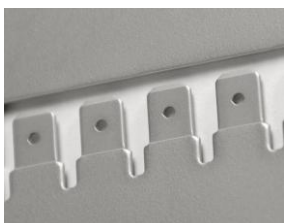



This chapter offers some interesting insights into the nearly endless possibilities of form design with punching technology. The shown special forms should inspire you to develop your own solutions for specific applications.










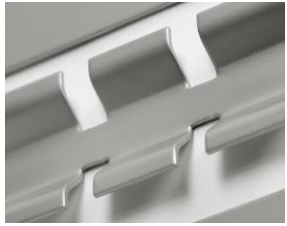
Sample sheet, tools size 5

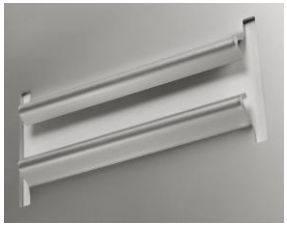
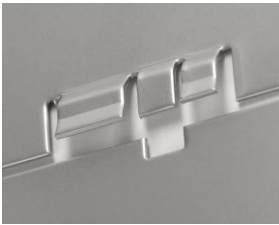
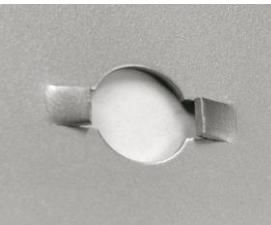

1. Flange	2. Flange	3. Flange, form	4. Flange, form
			


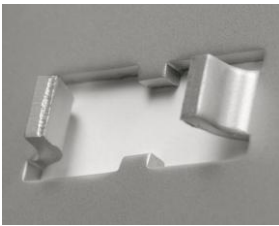
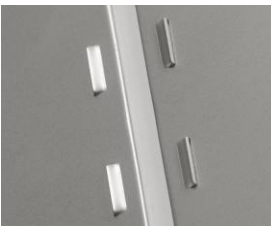
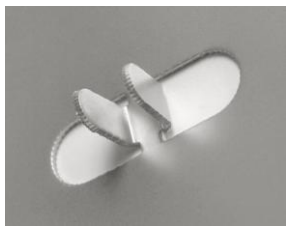
5. Flange, form	6. Flange, form	7. Flange, form	8. Flange, contact
			



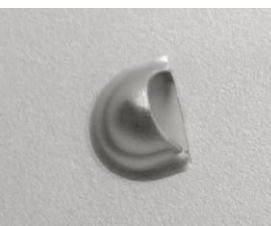

9. Flange, contact	10. Flange, wave	11. Flange, rigid	12. Flange, rigid
			




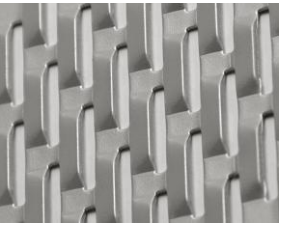
13. Flange, curved	14. Flange with imprinting	15. Flange with louver	16. Flange with stepping
			

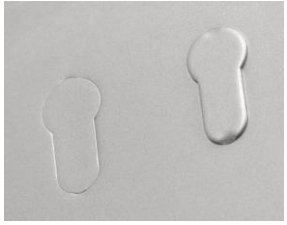



<p><b>17. Flange, form with countersink</b></p>	<p><b>18. Flange, double</b></p>	<p><b>19. Flange, double</b></p>	<p><b>20. Flange, double</b></p>
			



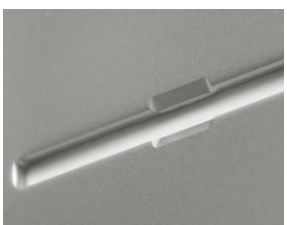
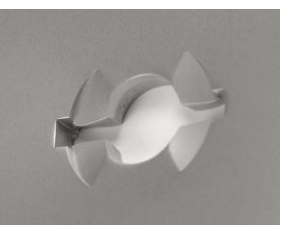
<p><b>21. Flange, double</b></p>	<p><b>22. Flange, multiple</b></p>	<p><b>23. Flange, multiple</b></p>	<p><b>24. Flange, multiple</b></p>
			

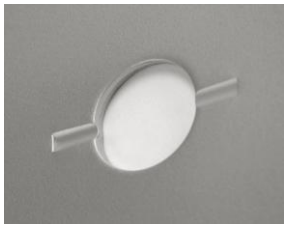
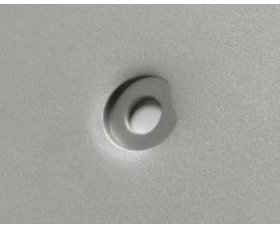
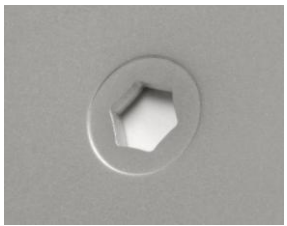
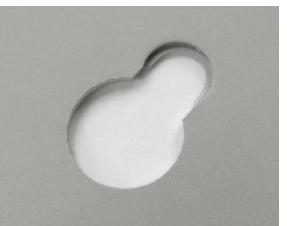
<p><b>25. Flange, multiple</b></p>	<p><b>26. Flange, multiple</b></p>	<p><b>27. Flange, multiple</b></p>	<p><b>28. Flange, multiple</b></p>
			

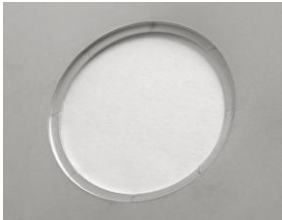
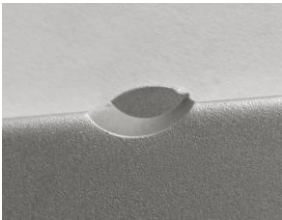
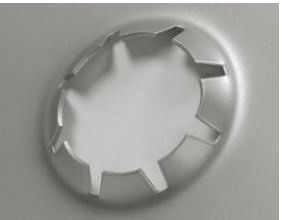
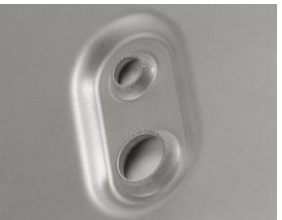
<p><b>29. Louver</b></p>	<p><b>30. Louver</b></p>	<p><b>31. Louver</b></p>	<p><b>32. Louver</b></p>
			




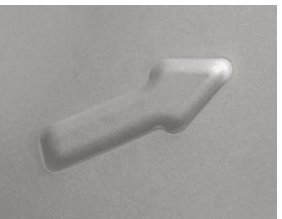
33. Louver with bridge	34. Small part with louvers	35. Louver, multiple	36. Louver, multiple
			





37. Knock-out, form	38. Knock-out, form	39. Knock-out, double	40. Center boss, square
			




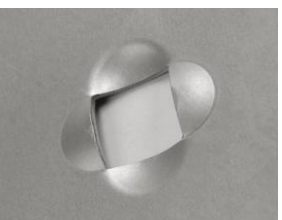
41. Center boss with punching	42. Countersink, form	43. Countersink, form	44. Countersink, form
			

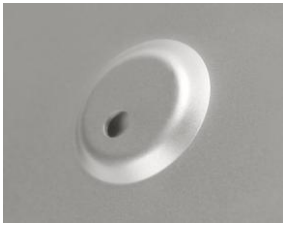
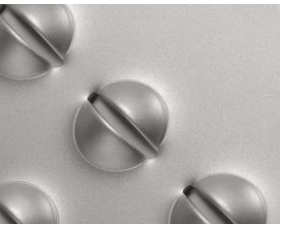

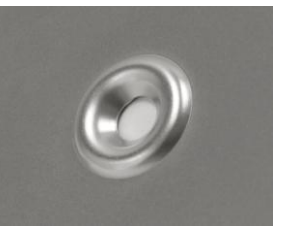
45. Countersink, form	46. Countersink, flat	47. Countersink, flat	48. Countersink, flat
			



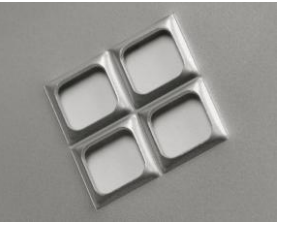

49. Countersink, flat	50. Countersink, flat	51. Countersink, slotted	52. Countersink in cup
			


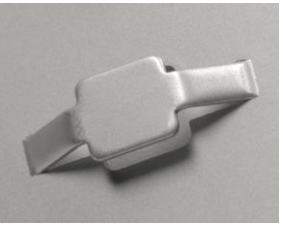
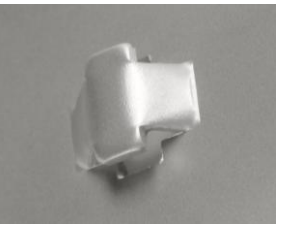
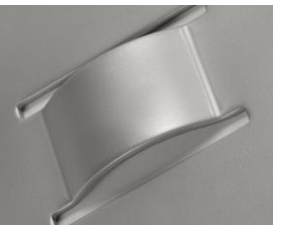
53. Cup, form	54. Cup, form	55. Cup, form	56. Cup, form
			

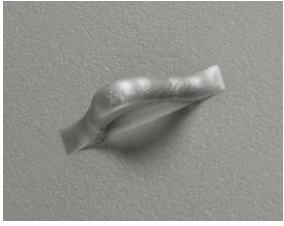
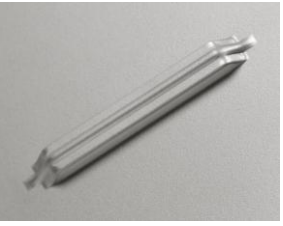


57. Cup, form	58. Cup, form	59. Cup, form	60. Cup, form
			

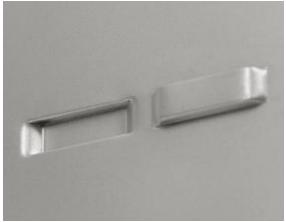
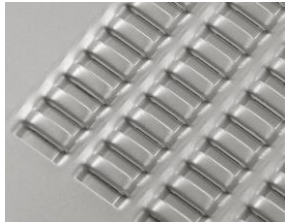

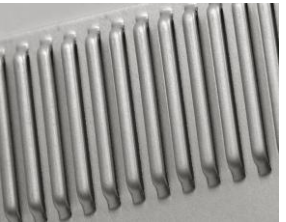
61. Cup, form	62. Cup, form	63. Cup, form	64. Cup, form
			



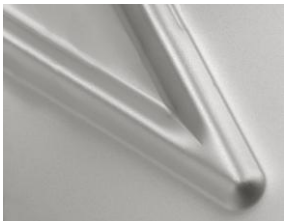

65. Cup, perforated	66. Cup, ball with punching	67. Cup with extrusion upward	68. Cup with countersink
			


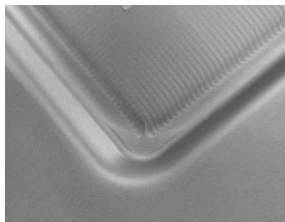


69. Cup with special form	70. Cup, double	71. Cup, multiple	72. Small part with cup
			





73. Bridge, form	74. Bridge, form	75. Bridge, form	76. Bridge
			

77. Bridge	78. Bridge, reinforcing bead	79. Bridge with sheet metal thread	80. Bridge with weld boss
			

81. Bridge, upward and downward	82. Bridge, upward and downward	83. Bridge, double	84. Bridge, multiple
			

85. Bridge, multiple	86. Beading, form	87. Beading, corner	88. Beading, cross
			

89. Stepping	90. Stepping	91. Embossing, scale	92. Embossing forms
			

93. Small part with embossing	94. Extrusion, form	95. Extrusion, form	96. Fold
			





# Order form

TRUMPF Werkzeugmaschinen GmbH + Co. KG  
**Fax: +49 7156 303-30310**

Order  Request

Company:	
Customer number:	Machine type:
Contact person:	Material:
Phone:	Sheet thickness s in mm:
Fax:	Delivery date:

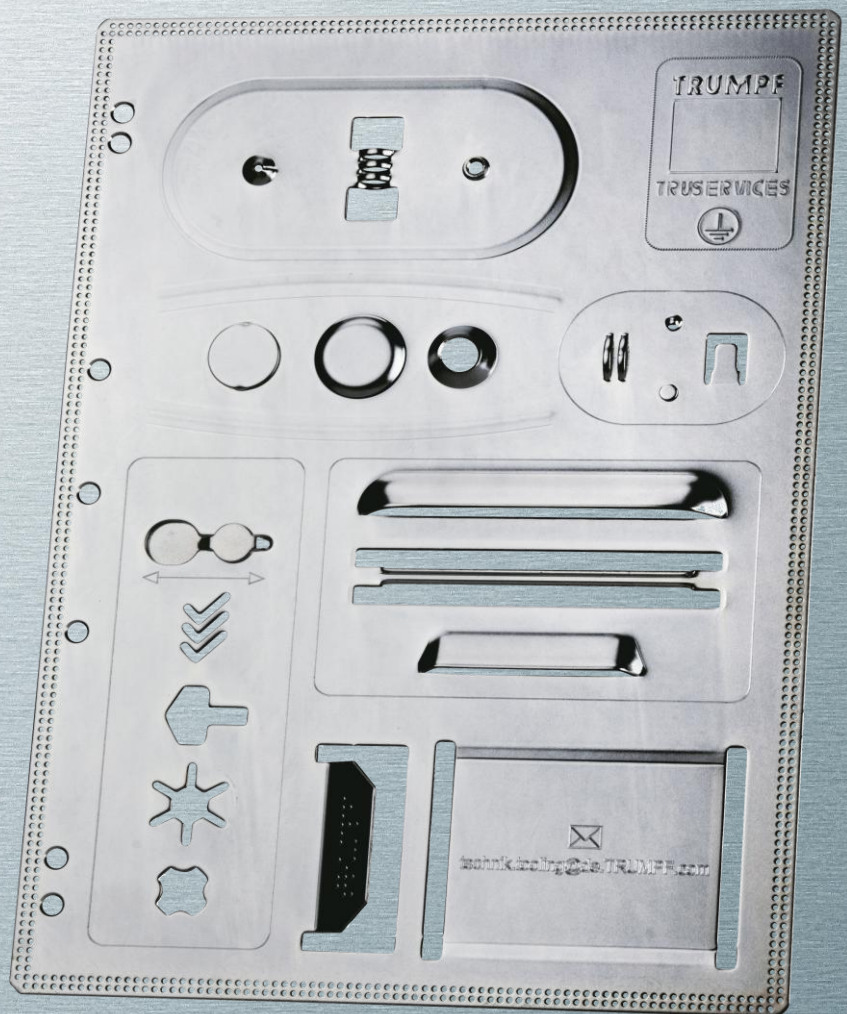
Chapter	Application Number	Designation	Dimensions (mm)	Quantity

Comments

---

---

Your ideas  
know no  
boundaries.



You can obtain these and other sample sheets from  
your local TRUMPF contact.

TRUMPF is certified according to ISO 9001: 2008

(for additional information see [www.trumpf.com/en/company/quality](http://www.trumpf.com/en/company/quality))

Ident. no. 1890267\_EN\_201407 - Specifications subject to change without notice