

RVMATE

Washen

2025 Edition

# SPR RIVETING SOLUTION

Simple, Reliable and Rapid installation

Automotive Lightweight  
Riveting Solution



[www.worldrivet.com](http://www.worldrivet.com)

Please contact us upon your riveting requirements!

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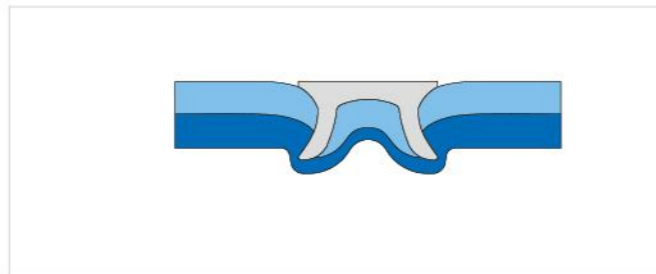
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# WHAT IS SPR CONNECTION?

SPR riveting is a new connection process specially designed for the connection issue of lightweight vehicles. With an external force, the SPR rivet can pierce through the first layer and middle layer of materials and flow and extend in the base materials, forming a mutually embedded deformed rivet connection process, which is called as SPR connection.

This riveting point has a high tensile strength and shear strength, called as self-piercing riveting point.

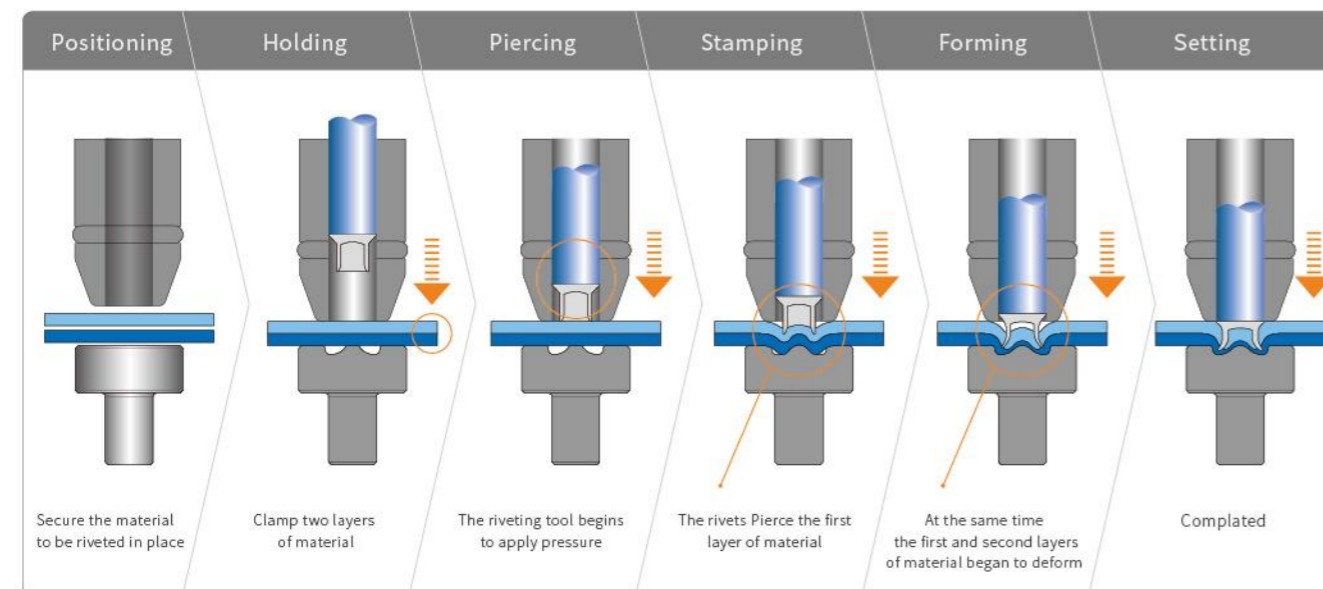
The lock riveting connection is a new type of connection process which is specially designed to solve the problem of lightweight automobile connection process.



\* The figure shows the profile of two layers of materials after self-piercing riveting.

## Self-Piercing Riveting -An Easy and Rapid Riveting Process

The process of SPR connection is different with that of welding. It includes positioning, clamping and automatic feeding of rivet. Then the rivet will pierce through the upper material and form plastic deformation in the bottom material, and finish shaping. This is an easy and rapid process.



# WHY CHOOSE SPR CONNECTION?

- 1 Multilayer and multi-type materials connecting.
- 2 Up to 14mm aluminum alloy and 8mm steel.
- 3 Up to 1200Mpa high strength steel plate.
- 4 No pre-drilling is required, improving the performance of anti-corrosion.
- 5 Glue can be applied between material plate, with little influence.
- 6 High connection strength and fatigue resistance.
- 7 Rapid completion of process and low energy consumption.
- 8 High accuracy of repeated connection.
- 9 Visual inspection of quality.
- 10 Meet the demand of full automation.
- 11 Free of smoke, steam and spark, low noise.

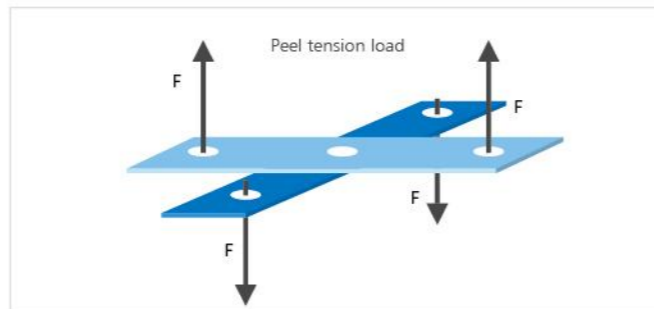
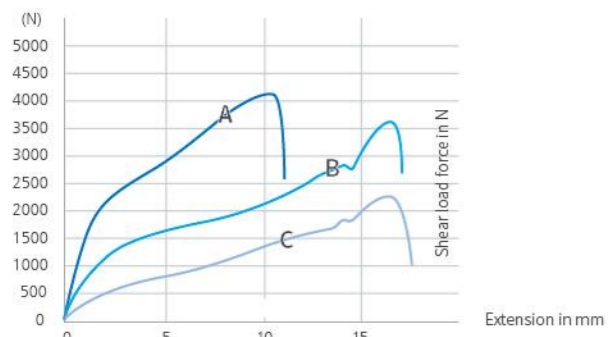
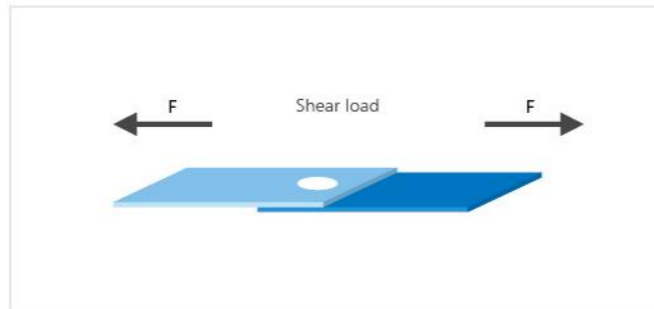
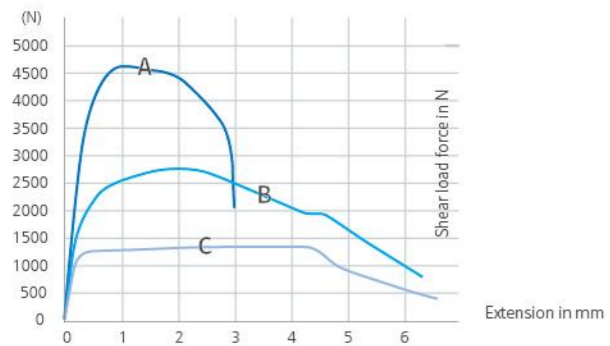
\* The figure illustrates the connection of three layers of materials



Scan to View Test Video  
In Youtube



Strength Test of self-piercing Connection Point



Joint A      Joint B      Joint C

Data source: Europe VAW Laboratory



Joint A

AlMg3 1.2 mm  
AlMg3 1.2 mm

Rivet type: C5×5SKR-H2



Joint B

H320 1.2 mm  
AlMg3 2.0 mm

Rivet type: C5×5SKR-H4



Joint C

H320 1.2 mm  
DC01 2.0 mm

Rivet type: C5×6SK-H4

SPR Connecting-Rules for the riveted products

Avoid closed profiles.



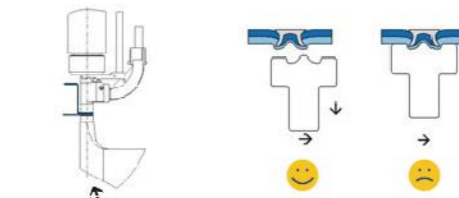
1

Enable accessibility for setting tool.  
Avoid vertical flanges.



2

Leave enough free space for the die and the C-frame.  
The C-frame must be lowered before the tool can be removed from the component.



3

For different individual sheet thicknesses observe the direction of the rivet.

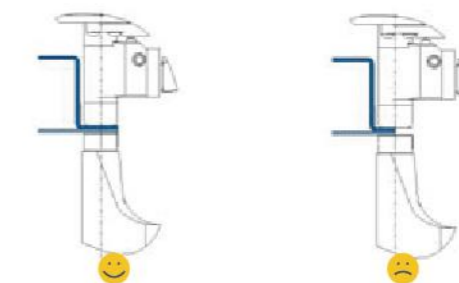
Preferably:

- Thin sheet into thick sheet
- Hard Sheet into Soft Sheet
- Non-Metal into the Metal Material



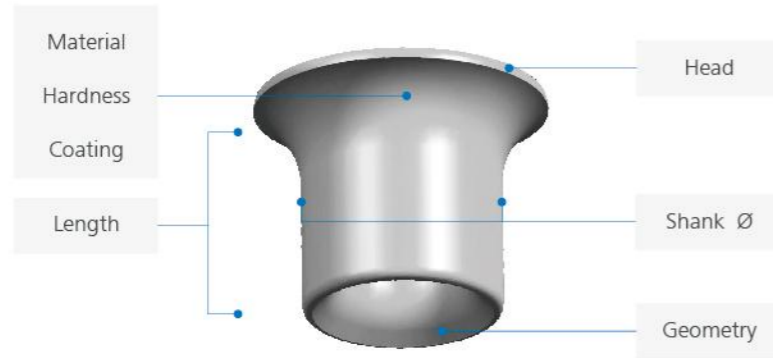
4

Provide sufficient flange width for rivet with 3mm 16mm  
for rivet with 5mm 18mm  
(without bending radii)

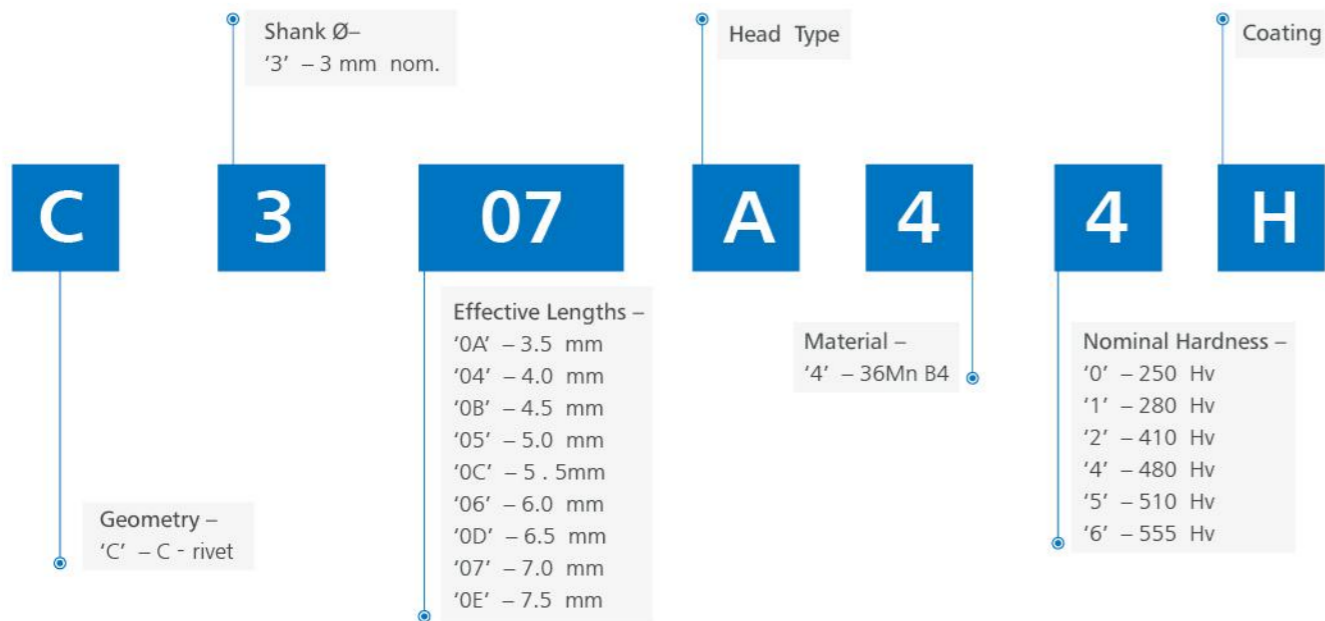


5

Rivmate Rivet Catalog



Part number build up



Rivet material

Code	Material
4	Boron steel 36MnB4

Rivet Coating

Code	Base Coating
H	Mechanical Zinc & Tin plating (70% Zinc/30% Tin) Mixed Coating
M	Electroplated Zinc Nickel
G	Zinc-Nickel Plating with MAGNI coating

Rivet hardness level

Code	Nominal Hardness (Hv)
0	230-280
1	255-305
2	380-440
4	450-510
5	480-540
6	530-580

Rivet length

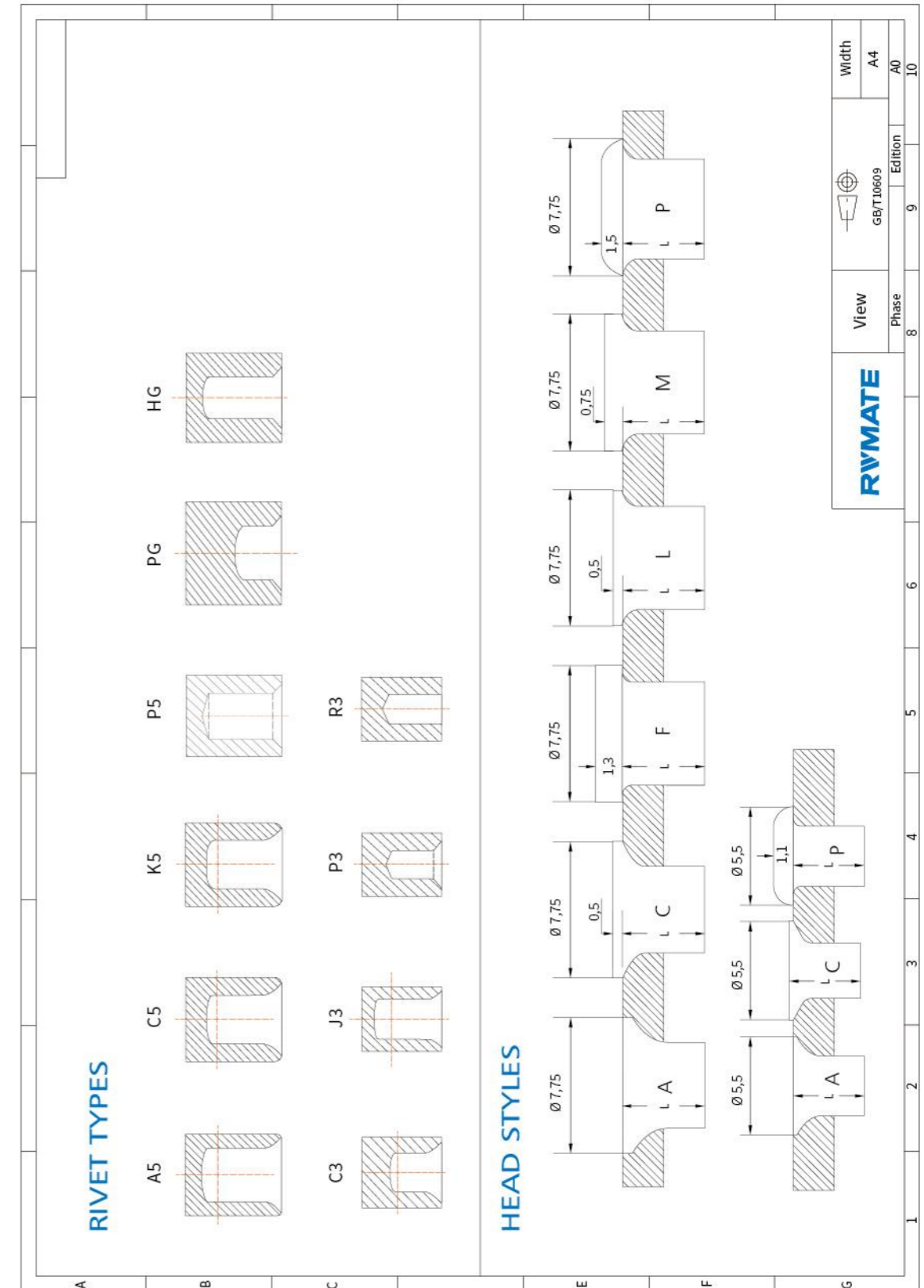
Code	Length, L (mm)
0A	3.5
04	4.0
0B	4.5
05	5.0
0C	5.5
06	6.0
0D	6.5
07	7.0
0E	7.5
08	8.0
0F	8.5
09	9.0
0G	9.5
10	10.0
0H	10.5
11	11.0
12	12.0

### Tape Type

Specification	Type 1	Type 2	Type 3
Ø 3.3 10000PCS /SPOOL			
Ø 5.3 5000PCS /SPOOL			

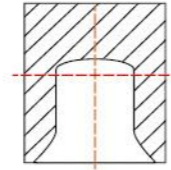
### Package Type

<b>Package 1</b> Carton Size 340*345*120	1 Spool / Carton		<b>Spool Size</b> 
<b>Package 2</b> Carton Size 340*345*230	2 Spools / Carton		
<b>Package 3</b> Carton Size 330*330*125	Loose Box Package	 	<b>Box Size</b> 



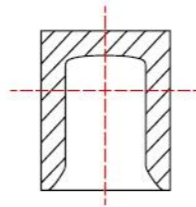
## Rivmate Rivet Catalog

C3xxxxxx



Applications	Automotive; Thinner Al. alloys and mild steel sheets
Diameters	3.3mm
Lengths	3.5 and 4 mm
Materials	Steel type"4" only
Hardnesses	Hardness Levels : H1, H2, H4, H6
Head Styles	"A" and "P" head

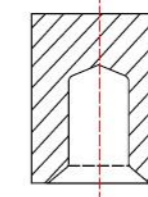
J3xxxxxx



Applications	Automotive/Transport/General Industry; All - aluminum and mixed material joints including milder steels up to some grades of higher strength steels
Diameters	3.3mm
Lengths	5 and 6 mm
Materials	Steel type"4" only
Hardnesses	Hardness Levels : H1, H2, H4, H6
Head Styles	"A" and "P" head

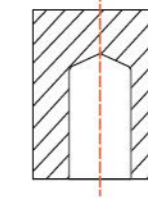
## Rivmate Rivet Catalog

P3xxxxxx



Applications	Automotive/Transport/General Industry; All - steel and mixed material joints including milder steels up to some grades of higher strength steels
Diameters	3.2mm
Lengths	4,5,6,7 mm
Materials	Steel type"4" only
Hardnesses	Hardness Levels : H1, H2, H4, H6
Head Styles	"C" and "P" head

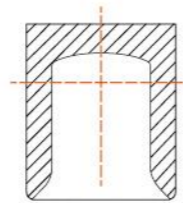
R3xxxxxx



Applications	General Industry; All - steel and mixed material joints including milder steels up to some gauges of HSS
Diameters	3.2mm
Lengths	4,5,6,7 mm
Materials	Steel type"4" only
Hardnesses	Hardness Levels : H2, H4, H6
Head Styles	"C" and "P" head

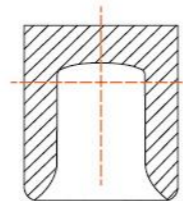
## Rivmate Rivet Catalog

A5xxxxxx



Applications	Automotive; Thinner Al. alloys and mild steel sheets
Diameters	5.3mm
Lengths	4, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 12mm
Materials	Steel type "4" only
Hardnesses	Hardness Levels : H0, H1, H2, H4, H5, H6
Head Styles	"A" head

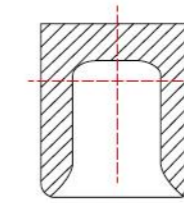
C5xxxxxx



Applications	Automotive/Transport/General Industry; All - aluminum and mixed material joints including milder steels up to some grades of higher strength steels
Diameters	5.3mm
Lengths	4,5,5.5,6,6.5mm
Materials	Steel type "4" only
Hardnesses	Hardness Level : "A" :H0, H1, H2, H4, H5, H6 "P" :H1, H2, H4, H6
Head Styles	"A" and "P" head

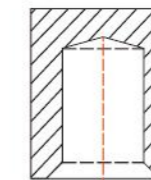
## Rivmate Rivet Catalog

K5xxxxxx



Applications	Automotive/Transport/General Industry; All - aluminum and mixed material joints including milder steels up to some grades of higher strength steels
Diameters	5.3mm
Lengths	7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 12mm
Materials	Steel type "4" only
Hardnesses	Hardness Level : "A" :H0, H1, H2, H4, H5, H6 "F" and "P":H1, H2, H4, H6
Head Styles	"A", "F" and "P" head

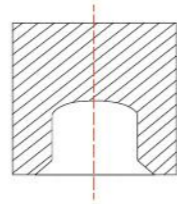
P5xxxxxx



Applications	Automotive/Transport/General Industry; All-steel and mixed material joints including milder steels up to some grades of higher strength steels
Diameters	5.2mm
Lengths	5,6,7,8,9,10,11,12 mm
Materials	Steel type "4" only
Hardnesses	Hardness Levels : H1, H2, H4, H6
Head Styles	"C" and "P" head

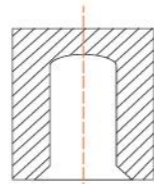
## Rivmate Rivet Catalog

PGxxxxx



Applications	General Industry; All - steel and mixed material joints including milder steels up to some grades of HSS
Diameters	5.5mm
Lengths	5,6,7,8mm
Materials	Steel type "4" only
Hardnesses	Hardness Levels : H4, H6
Head Styles	"F" "L" and "P" head

HGxxxxx



Applications	General Industry; All - steel and mixed material joints including milder steels up to some grades of higher strength steels
Diameters	5.5mm
Lengths	5, 5.5, 6.0, 6.5, 7.0,7.5 , 8.0mm
Materials	Steel type "4" only
Hardnesses	Hardness Levels : H4, H6
Head Styles	"M" head