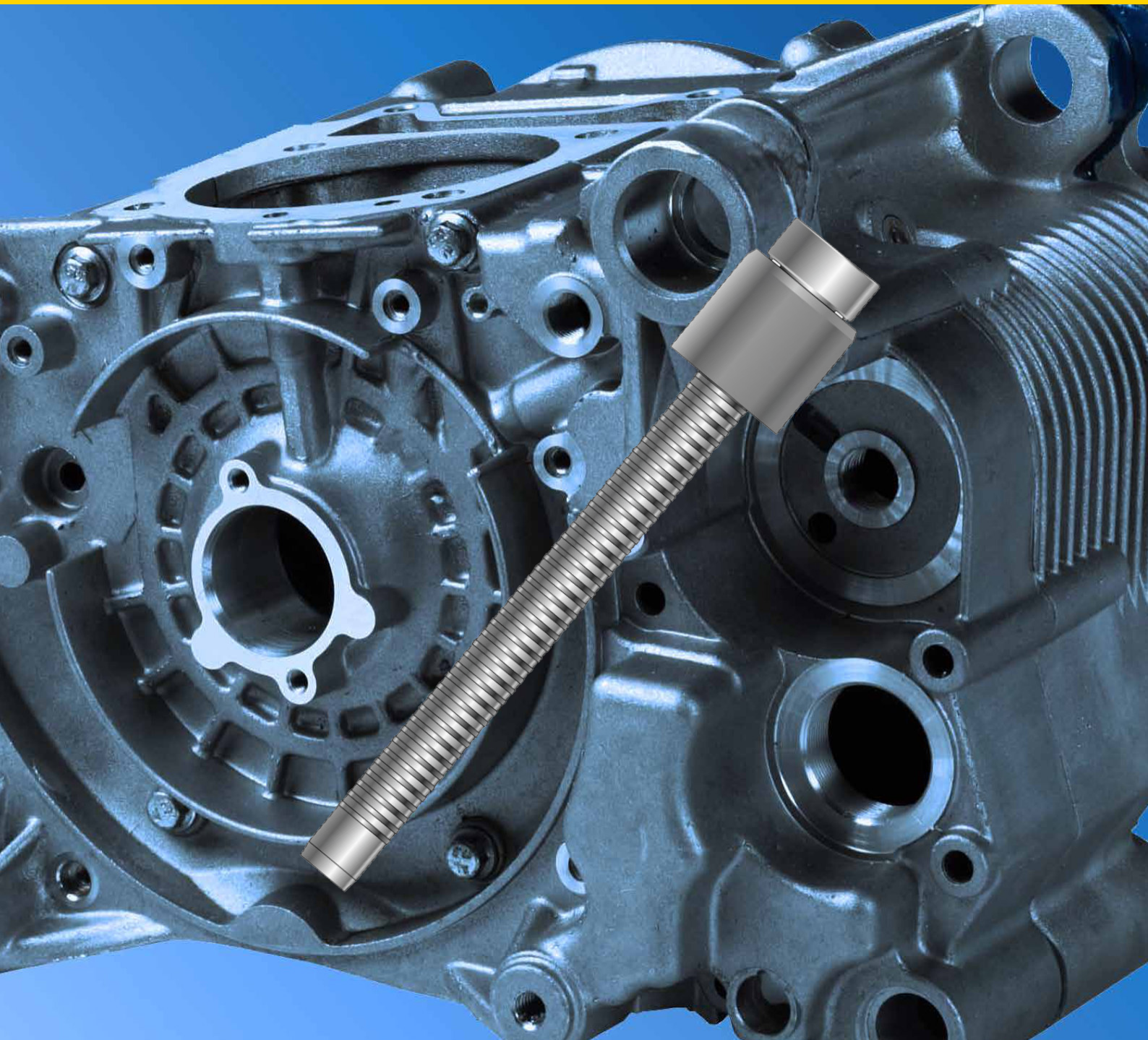


**STANLEY**<sup>®</sup>  
Engineered Fastening

**Rivetwise**



**Avseal**<sup>®</sup>  
Blind Sealing Plug

**POP**<sup>®</sup>  **Avdel**<sup>®</sup>

# Avseal®

The range of Avseal blind sealing plugs is unique in the efficient sealing performance provided in low- and high-pressure hole sealing applications. The rapidly installed two-piece plug offers technical characteristics that:

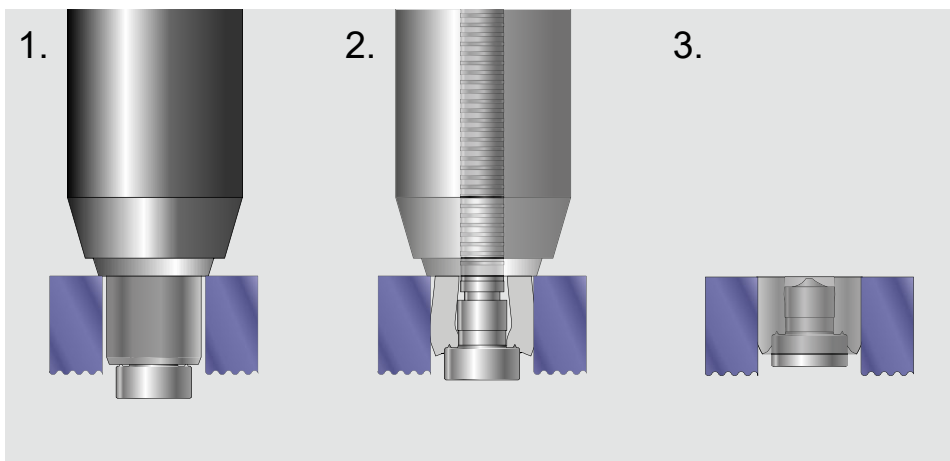
- Greatly improve quality and safety in demanding applications
- Simplify hole preparation and the installation process
- Offer an increased number of potential applications
- Lower assembly costs



## Key features and benefits

- Fully annealed sleeve for high performance sealing
- Hole fill capacity for improved seal and wider hole tolerance
- Larger hole tolerance simplifies hole alignment when automated placing is required
- Seal by compression of the sleeve improves sealing with great hole fill capability over a wider hole tolerance
- Internal lock – flat nose tip and ease of use
- Improved stem retention increases vibration resistance
- Low force special version can be used in thin wall applications
- Tapered sleeve and stem ease entry into application and nose tips, making Avseal suitable for automated systems
- Shorter placed length, reduced blind side protrusion for use in restricted space or thin wall applications
- Can be modified to suit specific applications
- Use of standard tooling – quality of seal is not operator-dependant

## Typical placing sequence



- 1) The Avseal sealing plug is located on the tool nose tip and inserted in the hole.
- 2) On activating the tool, axial compression of the sleeve between the stem head and the nose tip of the tool creates the radial expansion of the sleeve.
- 3) Once placed to a pre-determined load the pintail of the stem will break away leaving the Avseal sealing plug in the application.

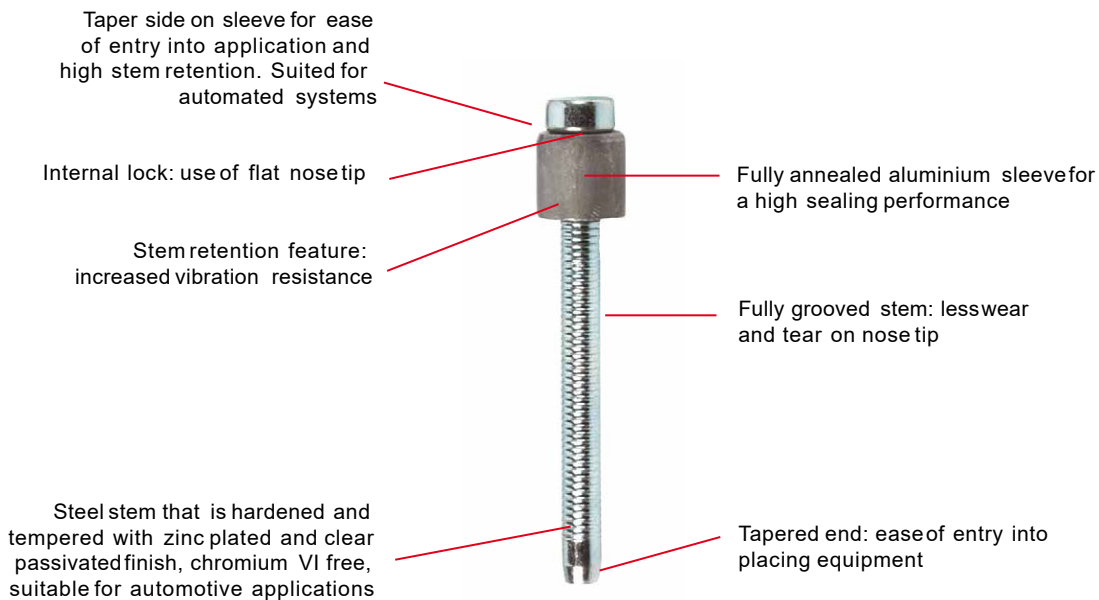
# Blind Sealing Plug

## Range

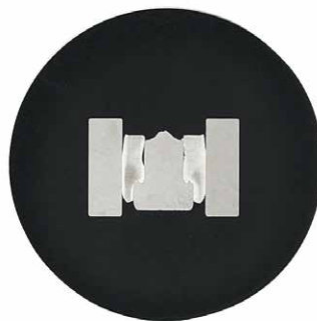
- Aluminium sleeve and steel stem
- Series 2961:  $\varnothing$  4 - 12 mm for high pressure applications ( > 300 bar )
- Series 2964:  $\varnothing$  9 - 16 mm with reduced radial expansion force for low pressure applications ( < 300 bar )



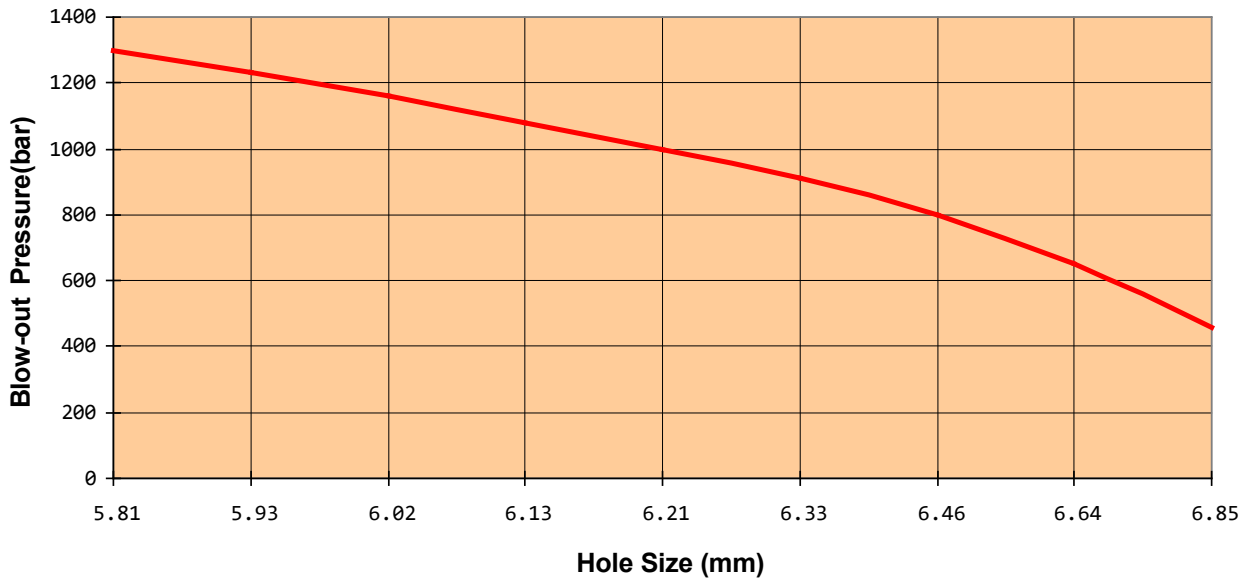
## Product details



- Designed for both low-pressure and high-pressure blind hole sealing applications
- High leak resistance
- Exceptional hole fill
- Efficient stem locking device
- Wide choice of installation tools



## Performance



### Average blow-out pressure at different hole sizes using the example of 6 mm Avseal series 2961

Tested in steel M257 (BS970 230 M 07), hole roughness 2 µm

Performance data of other diameters available on request.

Performance data are reference data only. Applied tests are required in every case. Contact your local representative for assistance.

## Ideal Applications

### High versatility

- Thin wall applications
- Restricted space
- Shorter hole length
- High pressure applications
- Holes with large tolerance

### Automotive

- Engine blocks
- Transmissions
- Cylinders
- Brakes
- Clutch
- Gear box

### Industrial

- Fluid handling
- Pneumatic systems
- Hydraulic blocks
- Compressors
- Refrigeration
- Pumps
- Gear box



Cylinder heads



Gear boxes



Valves



Pumps



Hydraulic components



Counterbalance cover

# Blind Sealing Plug

## Recommendations

For more detailed information please contact your STANLEYEngineeredFastening representative.

### 1. Hole size

- (i) When increasing the hole size, there is less contact with the hole area. Ultimate pressure capacity reduces and the placed length decreases.
- (ii) When an Avseal plug is used in a minimum or middle hole, standard or extended flat nose tips are suitable.
- (iii) When an Avseal sealing plug is used in a middle to maximum hole diameter, use only an extended nose tip.

### 2. Hole roughness

Recommended hole roughness is 1.3 to 6.3  $\mu\text{m R}_a$  (50 to 250  $\mu\text{inch R}_a$ ).  
Hole roughness below these values will reduce ultimate pressure capability.

### 3. Depth in hole: specific nose tips

According to required depth in hole, different nose tips can be used:

- Flush: flat nose tip
- 1 mm step
- 2 mm step
- 8 mm step

When depth in hole is below 1.5 x hole diameter, it is recommended to use an Avseal sealing plug with short sleeve option.



### 4. Wall thickness and hole distance

Depends on the application material. Detailed information on hole spacing calculation is available on request.

### 5. Sealing pressure versus material specification

Avseal plugs perform differently according to material of application. Tests must be performed on each material. The chart is an example of performance according to different materials with an Avseal plug  $\varnothing$  10 mm, high pressure version in 10.2 mm hole size.



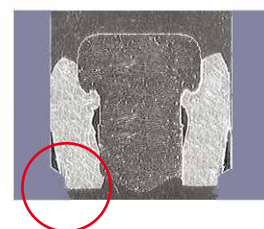
### 6. Removal procedure

Avseal sealing plugs can be removed from the work piece by using a Genesis®nG3 tool and an Avseal removal kit.  
Another Avseal plug can be placed in the same hole.

### 7. Increased pressure resistance: stepped hole

In case of requirement for improved pressure resistance, a stepped hole is necessary:

- Up to 2070 bar (30,000 lb/in<sup>2</sup>) for a 10 mm, high pressure version
- 3x pressure push out performance



## High pressure version - 2961 Series

### Material

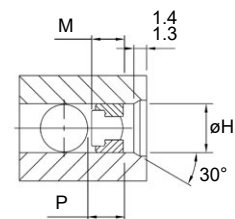
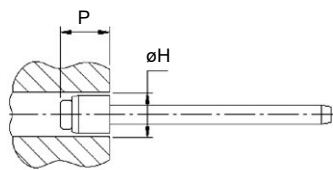
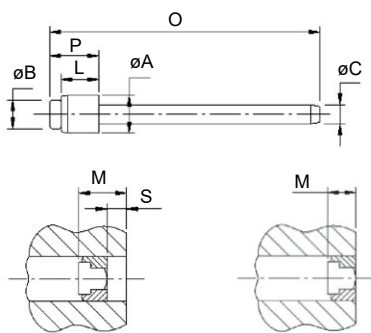
Sleeve: Aluminium alloy

(BS1473/4/5-6061/AA6061 EN573-3 AlMg1SiCu Werkstoff 3.3211)

Stem: Carbon steel, hardened and tempered,

Zinc plated, clear trivalent passivated with top seal

(BS3111 type 10 DIN 1654 35B2)



Taper hole entry only required for automated assembly.

ø	O max.	øB ref.	øA max.	L max.	øC ref.	øH			P <sup>1)</sup> req.	M <sup>1)</sup>		Part No
						min.	max.	rec.		min.	max.	
4.0	41.4	3.0	3.9	4.1	1.9	3.9	4.3	4.1	6.50	2.81	4.32	02961-00405
5.0	42.2	3.8	4.9	5.0	2.2	5.0	5.4	5.0	7.14	3.95	5.70	02961-00506
6.0	50.1	4.5	5.9	6.0	2.6	6.0	6.4	6.0	8.53	4.30	8.23	02961-00607
7.0	51.1	5.4	6.8	6.9	3.0	7.0	7.4	7.0	9.78	5.15	9.17	02961-00708
8.0	51.9	6.1	7.8	7.9	3.6	7.8	8.4	8.0	11.05	7.18	9.41	02961-00810
9.0	53.0	6.9	8.8	8.5	3.9	8.8	9.8	9.0	12.70	7.64	9.84	02961-00911
10.0	53.4	7.8	9.8	10.0	4.4	9.8	10.8	10.0	14.00	8.77	13.00	02961-01012
11.0	61.5	8.6	10.8	11.9	4.8	10.8	11.8	11.0	15.07	TBA <sup>2)</sup>	14.00	02961-01113
12.0	62.8	9.4	11.8	11.5	5.3	11.8	12.8	12.0	15.75	10.66	14.55	02961-01215

all dimensions in mm

1) Values for use with a flat nose tip (except for 4.0 & 5.0 mm where only stepped nose tips are available):

- Add „S“ = 1 mm / 2 mm / 8 mm to „P“ and „M“ values when a 1 mm / 2 mm / 8 mm extended nose tip is used

2) To be announced

# Technical Data

## Low pressure version - 2964 Series

### Material

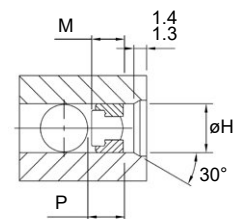
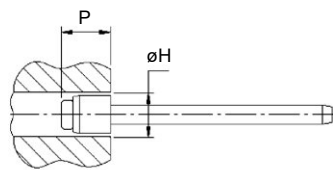
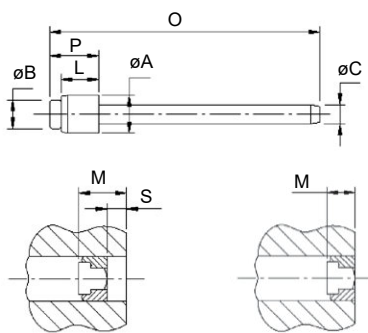
Sleeve: Aluminium alloy

(BS1473/4/5- 6061/AA6061 EN 573-3 AlMg1SiCu Werkstoff 3.3211)

Stem: Carbon steel, hardened and tempered,

Zinc plated, clear trivalent passivated with top seal

(BS3111 type 10 DIN 1654 35B2)



Taper hole entry only required for automated assembly.

ø	O max.	øB ref.	øA max.	L max.	øC ref.	øH			P <sup>1)</sup> req.	M <sup>1)</sup>		Part No
						min.	max.	rec.		min.	max.	
9.0	51.8	6.1	8.8	8.5	3.58	9.0	9.4	9.0	11.71	7.19	10.57	02964-00911
10.0	52.6	7.0	9.8	9.5	3.90	10.0	10.4	10.2	13.05	8.81	11.46	02964-01012
11.0	53.4	7.8	10.8	9.8	4.40	11.0	11.4	11.2	13.66	9.41	12.11	02964-01113
12.0	53.4	7.8	11.8	9.5	4.40	12.0	12.4	12.2	13.43	9.45	11.96	02964-01215
13.0	62.0	8.6	12.8	10.3	4.80	13.0	13.4	13.2	14.74	10.04	12.51	02964-01315
14.0	62.8	9.4	13.8	11.0	5.30	14.0	14.4	14.2	15.65	11.70	13.87	02964-01415
16.0	64.8	11.0	15.8	12.6	6.00	16.0	16.4	16.2	18.04	13.88	16.00	02964-01620

all dimensions in mm

1) Values for use with a flat nose tip:

- Add „S“ = 1 mm / 2 mm / 8 mm to „P“ and „M“ values when a 1 mm / 2 mm / 8 mm extended nose tip is used

# Avseal®

The Avseal range of blind sealing plugs can be installed with the current selection of structural hand tools and automated placing equipment.

The tapered end of the plug's stem ensures it is easy to feed into the tooling equipment, while the taper on the sleeve allows ease of entry into an application.

## Hand Tools



Range of Genesis®nG models

73200 model

734 AV™ model

### Placing Matrix

Diameter	Recommended Hand Tools				
	nG2/nG2-S	nG3	nG4	73200	734 AV
4 mm	2961				
5 mm	2961				
6 mm	2961	2961			
7 mm	2961	2961	2961		
8 mm		2961	2961		
9 mm		2964	2961, 2964		
10 mm			2961, 2964		
11 mm			2964	2961	
12 mm			2964	2961	
13 mm				2964	
14 mm				2964	
16 mm					2964

2961 series (High pressure version) 2964 series (Low pressure version)  
Other tools available, please ask your STANLEY Engineered Fastening contact.



# Installation tools

## Multi-head Workstations & Automated Systems



### Multi-head workstations

Multi-head systems, low cost solutions, manual feeding. Designed according to customer's specifications.



### Automated systems

Fully automated Viking® system can be robot mounted and integrated into unmanned production cells.

#### Customer example

Application consists of sealing redundant oil galleries on cylinder heads and blocks in order to improve the total quality of the engines. Oil leaks are undesirable for the engines and lead to a negative impact on quality image.

An automated Viking placing system is integrated into unmanned production cells and three Avseal plugs are placed in 22 seconds.

### Placing Matrix

Diameter	Recommended Automated Viking		
	Module 1	Module 2	Module 3
4 mm	2961		
5 mm	2961		
6 mm	2961		
7 mm	2961		
8 mm	2961		
9 mm	2964	2961	
10 mm		2964	
11 mm		2964	
12 mm		2964	
13 mm		2964	
14 mm		2964	
16 mm			2964

2961 series (High pressure version)

2964 series (Low pressure version)

Other tools available, please ask your STANLEY Engineered Fastening contact.

# Notes

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# Powerful Brands. Breakthrough Solutions.

At STANLEYEngineeredFastening we believe in seeking ways to serve our customers better. We create the future by anticipating our customers needs. Through diversifying our product lines, creating unique assembly technologies and offering a breadth of service to meet the demands of industry worldwide, STANLEYEngineeredFastening provides technological solutions to over 100 different industries.



## Avdel®

Avdel has been producing assembly systems since 1936 and offers a comprehensive range of fasteners and tooling.



## POP®

From 2mm micro rivets to 1/4" structural rivets, POP blind rivets meet the needs of multiple markets.



## Dodge®

With a focus on high-quality threaded inserts for plastics products, Dodge has been a leader in the fastening market since the 1950s.



## Spiralock®

Spiralock is a technologically superior fastening system ideally suited for threaded joint applications subjected to heavy shock and vibration.



## Gripco®

Gripco has been providing quality nut and threaded assembled products since 1904.



## STANLEY Assembly Technologies

STANLEY Assembly Technologies supplies production solutions to the global assembly market.



## Heli-Coil®

Based on a long history that began in the aerospace industry, Heli-Coil offers a vast range of high-quality thread inserts. Heli-Coil products available through Authorized Distributors or Licensed Global Partners.



## Tucker®

A one-sided drawn-arc welding process is the foundation of the Tucker No-Hole assembly solution.



## iForm®

iForm continues a proud heritage since 1969 and represents over 40 years of creative threaded fastener application engineering.

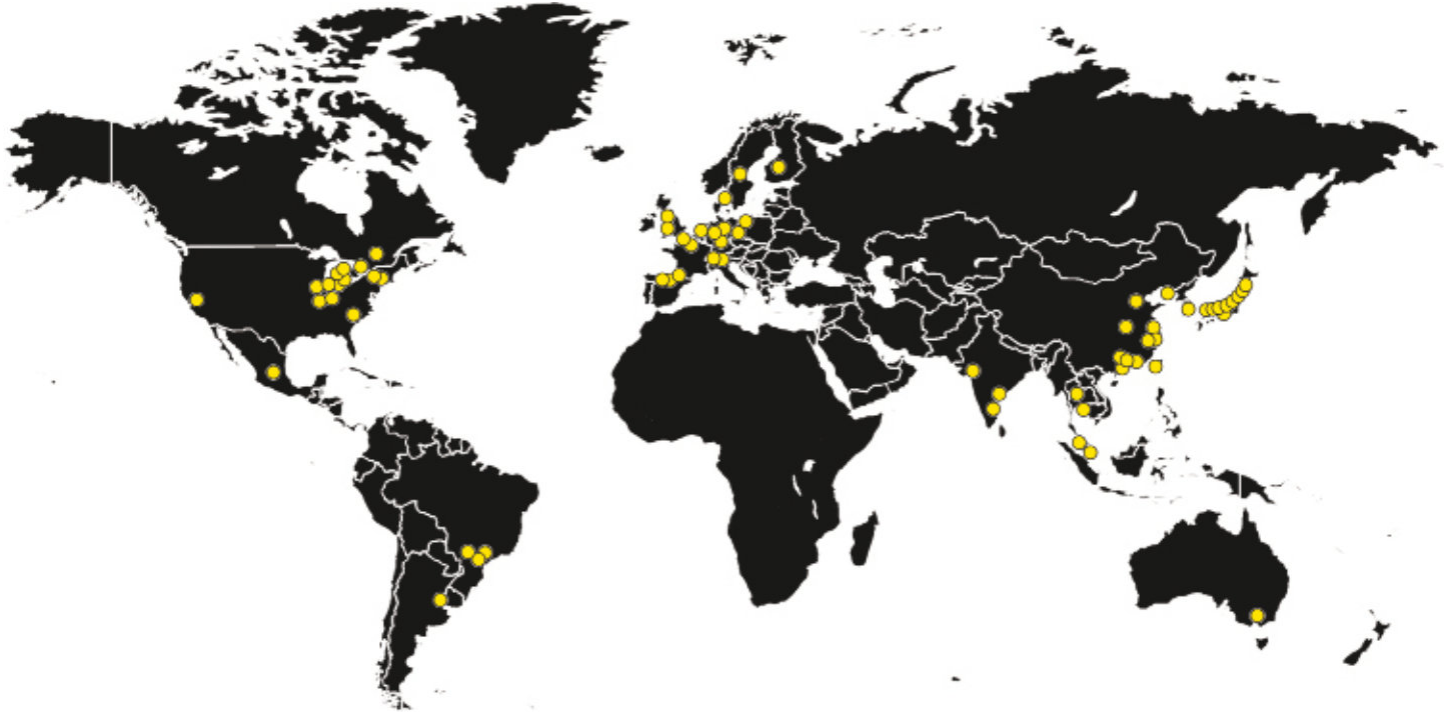


## Warren®

Whether it's plastic, metal, or a combination of the two, Warren can design a product that will suit your environment.

# STANLEY®

Engineered Fastening



STANLEY Engineered Fastening, a Stanley Black & Decker Inc. Company has been revolutionizing fastening and assembly technologies for a variety of industries for more than 40 years.

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