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2018/08/09

世鎧精密股份有限公司
SHEH KAI PRECISION CO.,LTD.

300 Series Austenitic Stainless Steel

Bi-Metal Self-Drilling Screws

Company Profile

SHEH KAI PRECISION CO., LTD. was established in 1992 in Kaohsiung, Taiwan. Our main plant is located at the center of KangSang industrial park. Specialized in manufacturing premium stainless steel Bi-metal self-drilling screws, Bi-Meal self-tapping screws, and Bi-Metal concrete screws, and SDS plus hammer drill bits with material of tungsten carbide. As a global leader of manufacture of Bi-Metal fastener, in these twenty years, we have developed a superior and unique production process such as dissimilar metal welding and induction heat treatment which are suitable for producing premium Bi-Metal products that meet the highest end requirements world-wise. With dedicated supports from our own stainless steel wire drawing factory, the stainless steel raw materials of the fasteners can be easily planned and acquired for mass production.
As a forerunner of the bi-metal fastener industry, we constantly strive to provide our customers with unique innovative solutions, high quality products as well as professional service along.

Quality Control

ISO 9001:2015 Certified

ISO 9001:2015 Certified

ISO 14001:2015 Certified

SHEH KAI
PRECISION CO.,LTD.

Contents

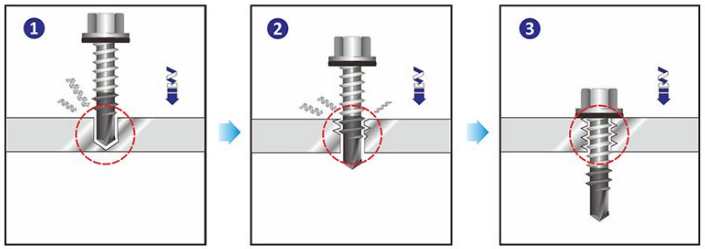
Longer Life time in outdoor environment

300 series Austenitic stainless steel
(Cold Forging,Nor Magnetic, Corrosion Resistance)

Alloy steel with induction heat treatment
(Superior Drilling Performance)

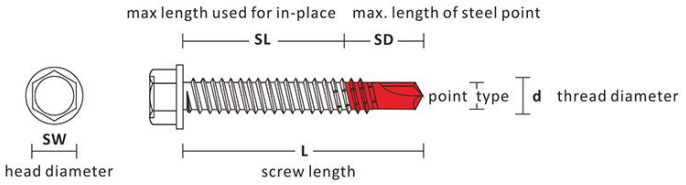
3 Fastening 2 Tapping 1 Drilling

One Working Process



1.Drilling 2.Tapping 3.Fastening

Choose The Right Screw From Dimensional Viewpoint



Ø5.5 x 25 Drill Point

- (thickness of application)
  - drilling point No.1 (SD<1+1mm)
  - drilling point No.2 (SD<3mm)
  - drilling point No.3 (SD<6mm)
  - drilling point No.5 (SD<12mm)
- **L** screw length (mm)
- **d** body diameter (mm)

Pull-Out Tests

Steel Thickness (mm)	Tensile Strength kgf (min)			
	#12 (Ø5.5)		#14 (Ø6.3)	
	NO.3 Point	NO.5 Point	NO.3 Point	NO.5 Point
2	300	–	310	–
3	530	–	580	–
4	780	–	800	–
6	810	–	900	–
10	–	920	–	1050
12	–	920	–	1050

- Note : For the length below 50mm,it can not apply the pull-out test for tensile.Therefore,length below 50mm will be tested per standard of torque.
- Steel Plate for Testing : According To DIN 7504, HV110~125 (HRB62.3~69.0).
- Tighten& Pull Test : According To ASTM F606-06 standard.

Mechanical Properties Tests

Drill Point	Size	Torque Strength kgf-cm(min)		Tensile Strength kgf(min)	Shear Strength kgf(min)
		SUS304 SUS316	SUS302		
NO.3 Point	#8 (Ø4.2)	45	36	–	–
	#10 (Ø4.8)	52	42	–	–
	#12 (Ø5.5)	84	68	810	620
	#14 (Ø6.3)	132	–	900	710
NO.5 Point	#12 (Ø5.5)	84	68	920	650
	#14 (Ø6.3)	132	–	1050	745

- Note : For the length below 50mm,it can not apply the pull-out test for tensile.Therefore,length below 50mm will be tested per standard of torque.

Screws Chemical Compositions ： %

Steel	C	Si	Mn	P	S	Ni	Cr	Mo	Cu
SUS XM7 (302 HQ)	Max 0.03	Max 1.00	Max 2.00	Max 0.045	Max 0.030	8.00~ 10.00	17.00~ 19.00	—	3.00~ 4.00
SUS 304 (304 M)	Max 0.08	Max 1.00	Max 2.00	Max 0.045	Max 0.030	8.00~ 10.00	18.00~ 20.00	—	—
SUS 316 (316CU)	Max 0.03	Max 1.00	Max 2.00	Max 0.045	Max 0.030	10.00~ 14.00	16.00~ 18.00	2.00~ 3.00	3.00~ 4.00

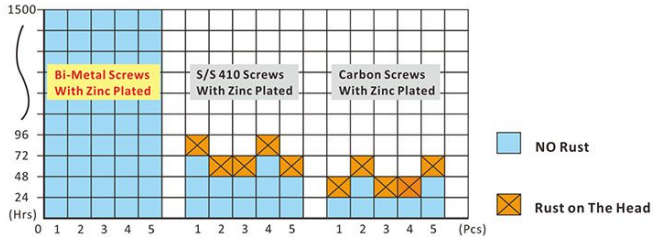
- Note : According to DIN ISO 3506, stainless steel chemical composition requirement of Cu contain can accept 4% and below.

Corrosion of Resistance

Corrosion of Fastener

From the past experience about the failure modes of the metal building, "Corrosion" is one major failure of the metal construction industries. Inside the interface-connection component of the Metal Building construction system, Corrosion of the screw always play a major reason for the failure.Therefore, choosing a right material for screw has been a very important issue to the designer. According to the America Uniform Building Code, the proposed product time limit of the public safety is required for at least 30-50 years. The material in which can reach its requirement is the Austenitic Stainless Steel Fastener of the SUS 300 series. It can prevent the corrosion process happened inside the panel & cladding. Not only to ensure the safety of the building and also to avoid the huge amount of the repair cost !

Salt Spray Test Comparision According to ASTM B117



Coating of Bi-Metal Fastener

Coating	Zinc W/WAX		Ruspert		Tufcote (Ruspert)	
Salt Spray Test	24 hrs (2 μ)	72 hrs(8 μ)	500 hrs	1000 hrs	1500 hrs	2000 hrs
Kesternich Test	NO	NO	5 cycle	15 cycle	25 cycle	25 cycle
Australian Standard	NO	Class 1	Class 2	Class 3	Class 4	Class 4
Basic Characteristic	Zinc Coating Consists of 1 Layer : 1 1st layer is metallic zinc protecting the metal.		Ruspert Coating Consists of 2 Layers : 1 1st layer is metallic zinc protecting the metal. 2 2nd layer is the baked ceramic coating.		Tufcote Coating Consists of 3 Layers : 1 1st layer is metallic zinc protecting the metal. 2 2nd layer is a Ceramic Surface Coating. 3 3rd layer is a PU modified Epoxy	
Recommend	General use in internal application.		External use in mild moderate industrial or marine environments.		External use in severe marine environment.	

Self-Drilling Screws for the building and construction industries

Corrosion Resistance Class Requirements (Australian Standard AS 3566.2-2002)

Corrosion Resistance Class	Atmosphere of Intended Use
Class 1	General use in internal application. AS 2331.3.1 (Salt Spray Test) for 72 h.
Class 2	General use in other than external applications but where significant levels of condensation occurs. AS 2331.3.1 (Salt Spray Test) for 240 h , DIN50018 (Kesternich Test) for 5 Cycles.
Class 3	External use in mild moderate industrial or marine environments.Corrosivity categories C2 and C3 classified accordance with ISO 9223. AS 2331.3.1 (Salt Spray Test) for 1000 h , DIN50018 (Kesternich Test) for 15 Cycles.
Class 4	External use in severe marine environment. Corrosivity C4 classified in accordance with ISO 9223. AS 2331.3.1 (Salt Spray Test) for 1500 h , DIN50018 (Kesternich Test) for 25 Cycles.

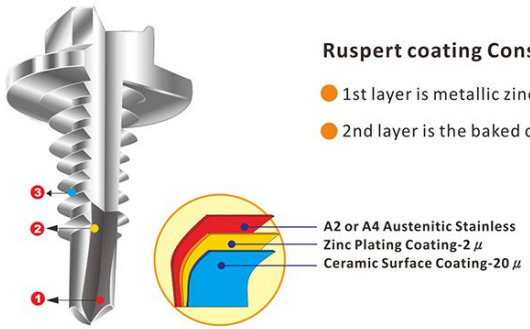
■ Originated as AS 3566-1988 Revised and redesignated in part as AS3566.2-2002

Fastener Coating

Bi-Metal Screw Applied With Ruspert Coating :

AS-3566 Class 3 AS 2331.3.1 for 1000h standard.

Ruspert metal finish is a high-grade metal surface processing technology that prevents corrosion. It is the tight joining of the baked ceramic surface coating and metallic zinc protection.These layers are bonded together through chemical reactions,and this unique method of combining layers results in a rigid combination of the coating films. Ruspert treatment does not attribute its anti-corrosion properties to merely a single material,but the synergy of these two layers,which combined have superb rustproof qualities. Corrosion resistance against scratches, gas,weathering and other kinds of corrosive factors including salt water. Low processing temperature,as the drying temperature below 220°C protects the products from metallographic changes. It strengthens the product by prevent embrittment & hole corrosion after the heating treatment. Electrolytic corrosion resistance as it is less contact corrosion with other metals.

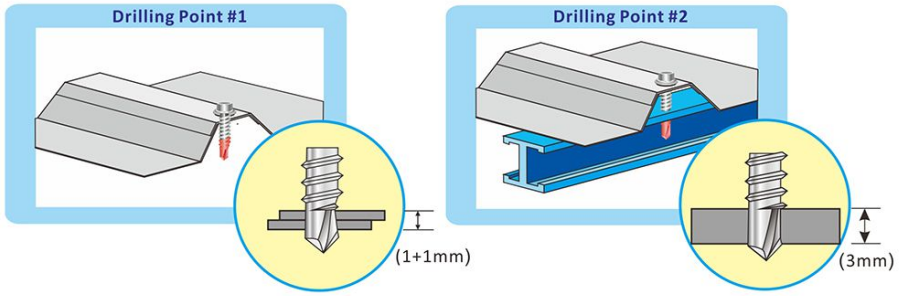


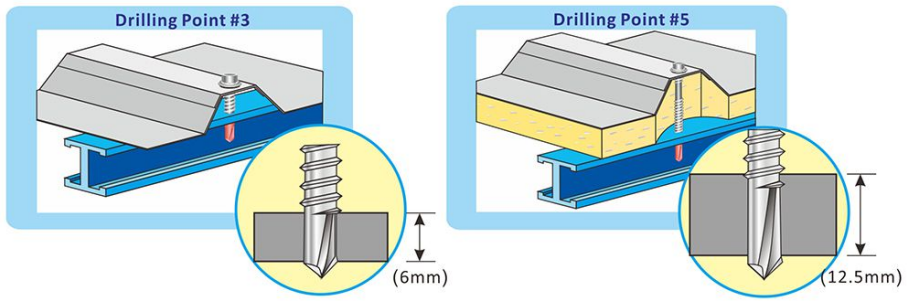
Ruspert coating Consists of 2 Layers:

- 1st layer is metallic zinc protecting the metal.
- 2nd layer is the baked ceramic coating.

Industrial Lightweight Construction

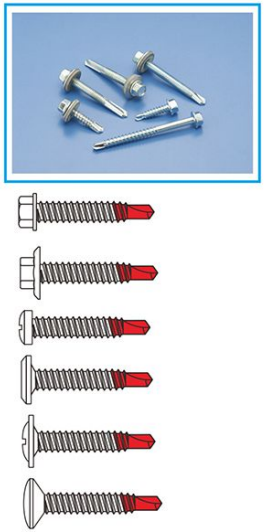
Austenitic Stainless Steel SUS A2-302 / A2-304 / A4-316





Industrial Lightweight Construction

Austenitic Stainless Steel SUS A2-302 / A2-304 / A4-316

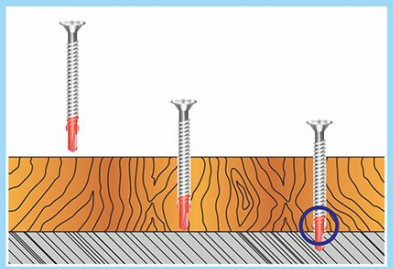


Diameter Size	Length(mm)		Point Size	Max Drilling capacity(mm)	Drive Speed (R.P.M)
	min	max			
Ø4.2	16	45	#1	1+1	1800-2500
Ø4.8	19	180	#1	1+1	1800-2500
Ø5.5	22	300	#1	1+1	1800-2500
Ø6.3	22	300	#1	1+1	1800-2500
Ø4.2	16	45	#2	2	1800-2500
Ø4.8	19	180	#2	3	1800-2500
Ø5.5	22	300	#2	3	1800-2500
Ø6.3	22	300	#2	3	1800-2500
Ø4.2	16	45	#3	3	1800-2500
Ø4.8	19	180	#3	4	1800-2500
Ø5.5	25	300	#3	6	1800-2500
Ø6.3	25	300	#3	6	1000-1800
Ø5.5	38	300	#5	12.5	1000-1800
Ø6.3	38	300	#5	12.5	1000-1800

Diameter Size	Length(mm)		Point Size	Max Drilling capacity(mm)	Drive Speed (R.P.M)
	min	max			
Ø5.5/4.8	50	300	#1	1+1	1800-2500
Ø6.3/5.5	50	300	#1	1+1	1800-2500
Ø7.0/6.5	50	300	#1	1+1	1800-2500
Ø5.5/4.8	50	300	#2	3	1800-2500
Ø6.3/5.5	50	300	#2	3	1800-2500
Ø7.0/6.3	50	300	#2	3	1800-2500
Ø5.5/4.8	50	300	#3	6	1800-2500
Ø6.3/5.5	50	300	#3	6	1800-2500
Ø7.0/6.3	50	300	#3	6	1000-1800
Ø6.3/5.5	63	300	#5	12.5	1000-1800
Ø7.0/6.3	63	300	#5	12.5	1000-1800

Countersunk Head Wing Screw
Austenitic Stainless Steel SUS A2-302 / A4-316

Application Example



Wing screws for fastening timber to steel rails and purlins from 6-12mm. The screw wings ream a hole through the timber, and break away before drilling into steel.

Flat Head

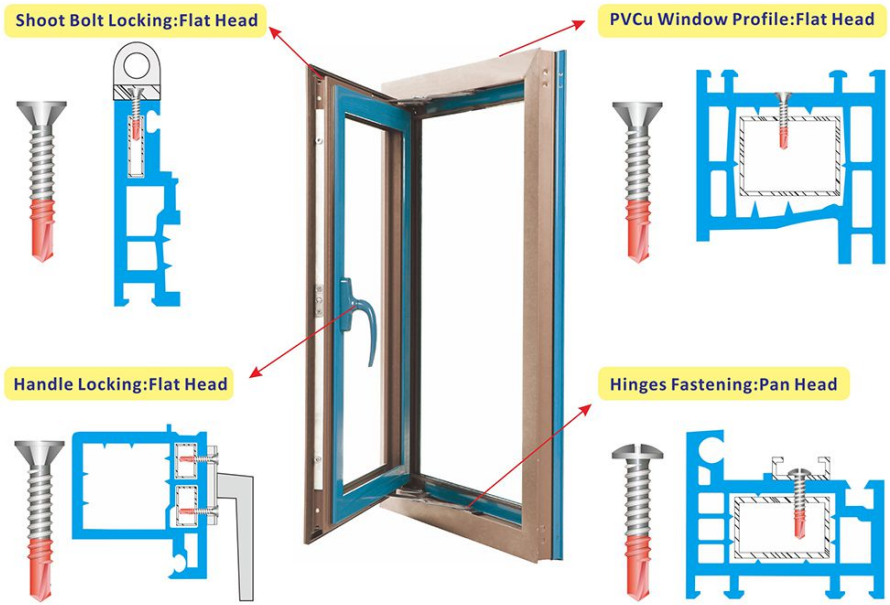
Diameter Size	Length(mm)		Point Size	Max Drilling capacity(mm)	Drive Speed (R.P.M)
	min	max			
Ø4.2	25	40	#3	3	1800-2500
Ø4.8	25	75	#3	4	1800-2500
Ø5.5	32	200	#3	6	1800-2500
Ø5.5	55	130	#5	6-12	1000-1800
Ø6.3	55	300	#5	6-12	1000-1800

Bi-Metal Self-Drilling Screw Austenitic Stainless Steel
Flat Head Screw SUS A2-302 / A4-316

Flat Head

Diameter Size	Length(mm)		Point Size	Max Drilling capacity(mm)	Drive Speed (R.P.M)
	min	max			
Ø4.2	19	45	#2	3	1800-2500
Ø4.5	19	180	#2	3	1800-2500
Ø5.5	25	300	#2	3	1800-2500
Ø4.2	19	45	#3	3	1800-2500
Ø4.8	25	180	#3	4	1800-2500
Ø5.5	25	300	#3	6	1800-2500
Ø6.3	30	300	#3	6	1000-1800
Ø5.5	38	300	#5	12	1000-1800
Ø6.3	38	300	#5	12	1000-1800

Bi-Metal Window Screw
Austenitic Stainless Steel SUS A2-302



Flat Head

Diameter Size	Length(mm)		Point Size	Max Drilling capacity(mm)	Drive Speed (R.P.M)
	min	max			
Ø4.2	19	45	#3	3	1800-2500
Ø4.5	19	45	#3	3	1800-2500

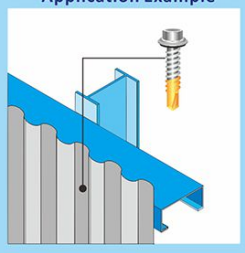
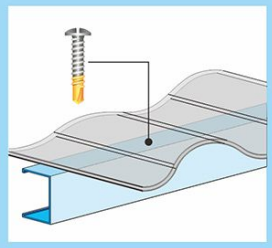
Pan Head

Diameter Size	Length(mm)		Point Size	Max Drilling capacity(mm)	Drive Speed (R.P.M)
	min	max			
Ø4.2	16	29	#3	3	1800-2500
Ø4.5	16	29	#3	3	1800-2500

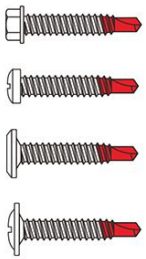
Bi-Metal Self-Drilling Screw Austenitic Stainless Steel

- Direct application on stainless steel plate.
  (maximum 2mm-Bi-Metal technology)

Application Example

Hex Washer/Pan/Wafer/Truss Head



Diameter Size	Length(mm)		Point Size	Max Drilling capacity (mm) on S.S.plate	Max Drilling capacity (mm) on Steel plate	Drive Speed (R.P.M)
	min	max				
Ø4.2	16	25	#3	2	3	Max. 2500
Ø4.8	19	25	#3	2	4	Max. 2500
Ø5.5	19	32	#3	2	6	Max. 2500
Ø6.3	25	38	#3	2	6	Max. 2500

Flat Head

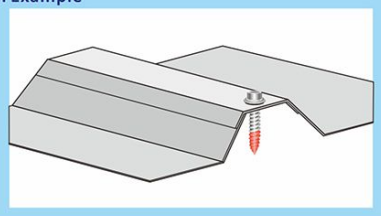
Diameter Size	Length(mm)		Point Size	Max Drilling capacity (mm) on S.S.plate	Max Drilling capacity (mm) on Steel plate	Drive Speed (R.P.M)
	min	max				
Ø4.2	16	25	#3	2	3	Max. 2500
Ø4.8	19	25	#3	2	4	Max. 2500

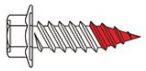
Side Lap Screw (Special Thread, Pre-drilled unnecessary)

Austenitic Stainless Steel SUS A2-304

- Designed to attach the Steel Plate or Aluminium.

Application Example

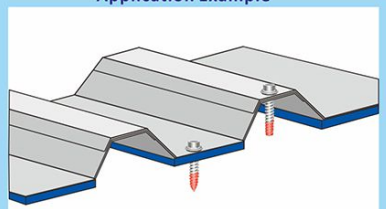


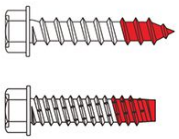
Diameter Size	Length(mm)		Point Size	Max Drilling capacity (mm) on Steel plate	Drive Speed (R.P.M)
	min	max			
Ø4.8	19	25	sharp point	0.8+0.8	Max. 1800
Ø5.5	19	25	sharp point	0.8+0.8	Max. 1800
Ø6.3	22	25	sharp point	0.8+0.8	Max. 1800

Bi-Metal Self-Tapping Screw Austenitic Stainless Steel

- Self-Tapping Screw, stainless steel(A2), type B for fastening steel sheet to steel framing profiles with or without intermediate insulation material.
- Sharp Point Drilling Capacity :
  1.00+2.00mm (Pre-drilled hole 5.00mm)
  0.63+0.63mm (Pre-drilled hole 3.50mm)
- Blunt Point Drilling Capacity :
  1.5mm (Pre-drilled hole 4.9mm)
  3.0mm (Pre-drilled hole 5.05mm)
  4.0mm (Pre-drilled hole 5.35mm)
  5.0mm (Pre-drilled hole 5.65mm)
  6.0mm (Pre-drilled hole 5.8mm)
  10 mm (Pre-drilled hole 5.85mm)

Application Example





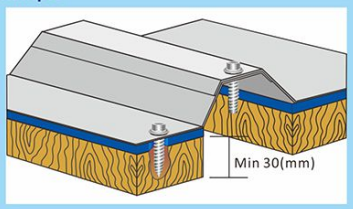
Diameter Size	Length(mm)		Point Size	Drive Speed (R.P.M)
	min	max		
Ø6.5	19 - 300		sharp / blunt	Max. 1800

High Strength A2 Stainless Steel Tapping Screw

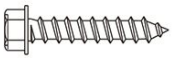
Austenitic Stainless Steel SUS A2-304

- "8-18" Stainless Steel with special treatment to improve strength characteristics.
- Easier to tapping, thread wear resistance.
- Higher torsion strength characteristics (20% improve).
- Higher pull-out strength.

Application Example



(A2-304) Modify Self-Tapping Screw Sharp / Blunt point

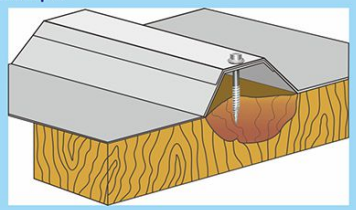


Diameter Size	Length(mm)		Point Size	Drive Speed (R.P.M)
	min	max		
Ø6.3	19	300	sharp/blunt	Max. 800

- Self-Tapping Screw, stainless steel(A2), type B for fastening steel sheet to steel framing profiles with or without intermediate insulation material.
- Sharp Point Drilling Capacity :
  1.00mm+2.00mm(Pre-drilled hole 5.00mm)
  0.63+0.63mm(Pre-drilled hole 3.50mm)
- Blunt Point Drilling Capacity :
  1.0mm(Pre-drilled hole 4.35mm) / 1.5mm(Pre-drilled hole 4.9mm).
  3.0mm(Pre-drilled hole 5.05mm) / 4.0mm(Pre-drilled hole 5.35mm)
  5.0mm(Pre-drilled hole 5.65mm) / 6.0mm(Pre-drilled hole 5.8mm)
  10mm(Pre-drilled hole 5.85mm)

Stainless Steel Screw Type 17 (Hex Washer Flange Head)

Application Example



Diameter Size	Length(mm)		Point Size	Drive Speed (R.P.M)
	min	max		
Ø6.3	19	300	sharp	Max. 800

- Drilling Capacity : 1.00mm+2.00mm (Pre-drilled hole 5mm)
  0.63mm+0.63mm (Pre-drilled hole 3.5mm)

Metric Thread Bolts / Screws

Size

Diameter Size		Length(mm)		Material
min	max	min	max	
M4	M36	20	300	Carbon Steel/Alloy Steel/Stainless Steel (302/304-A2/316-A4)

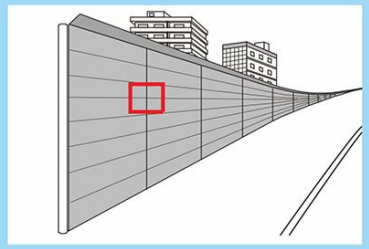
Standard

IFI, DIN931, DIN933, DIN603, DIN912, DIN7984, DIN 7380, DIN7991..etc.

Finish

Zinc Plated(White/ Yellow/ Blue/ Green/ Black), Nickel Plated, Zinc-Iron Alloy Plated, Geomet, Dacromet, Ruspert, Hot Dip Galvanized, Mechanical Plated, Nylon Patch, Passivation..etc.

Application Example



Application

Industry, Construction and Machinery.
Metric Thread Bolts can be in widespread use such as fastening wood and steel, mechanical equipments, outdoor facility and other construction materials, the docks, bridges, highway structures and buildings.

Double Ends Hanger Bolts (Dowel Screw)

Size

Diameter Size		Length(mm)		Material
min	max	min	max	
M4	M36	50	300	Carbon Steel/Alloy Steel/Stainless Steel (302/304-A2/316-A4)

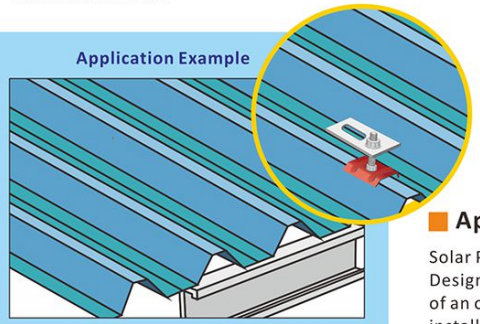
Standard

DIN88149

Finish

Zinc Plated (White/ Yellow/ Blue/ Green/ Black), Nickel Plated, Zinc-Iron Alloy Plated, Geomet, Dacromet, Ruspert, Hot Dip Galvanized, Mechanical Plated, Nylon Patch, Passivation..etc.

Application Example



Application

Solar Panel Fastening and Overhead Installation. Designed for insertion into the pre-drilled hole of an outdoor solar panel facility or overhead installation.

Special Bolts/ Screw

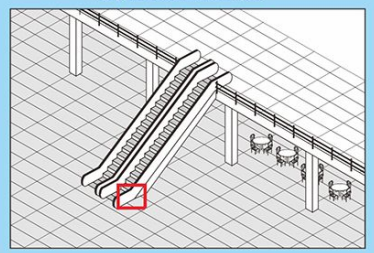
Size

Diameter Size		Length(mm)		Material
min	max	min	max	
M4	M36	20	300	Carbon Steel/Alloy Steel/Stainless Steel (302/304-A2/316-A4)

Finish

Zinc Plated (White/ Yellow/ Blue/ Green/ Black), Nickel Plated, Zinc-Iron Alloy Plated, Geomet, Dacromet, Ruspert, Hot Dip Galvanized, Mechanical Plated, Nylon Patch, Passivation..etc.

Application Example



Application

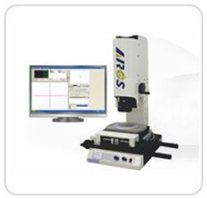
Customized Design and Drawing Mostly.
Special Bolts/ Screws can be used in a wide range of configurations or a specific projects such as escalator, elevator, T-extrusion track and all kinds machinery.

Quality Control

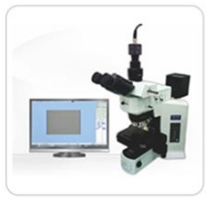
Based on the customer guidelines and continuous improvement, our company has formulated the innovative, professional, efficient and impeccable service as our quality policies. Quality control during each production process, with computerized testing and knowledgeable personnel, ensures that the highest standard is upheld. The quality of our manufacturing processes ensures us that we can meet and surpass the level of standard our customer expected.

Coating thickness testing machine

Vickers hardness testing machine



Non contact visual measuring microscope



Metallographic analysis microscop

Computerized drill through testing machine

Computerized pullout testing machine

Kesternich testing machine

Salt spray testing machine

Project

Taiwan construction projects that use Bi-Metal Screw from SHEH KAI

- Taiwan High Speed Rail Platform Construction Project.
- Kaohsiung Mass Rapid Transit Project.
- Formosa Petrochemical Corp Mailiao Refinery Project.
- Taipei NeHu Mass Rapid Transit Platform Project.
- Xindian Light Weight-Steel Housing Construction Project.
- FPCC MAILIAO IEM Plant Circular Salt Storage Dome Engineering.
- Taiwan TaiChong Dragon Steel Expansion Project.
- China Steel Mill Renovation Project.
- Taipei Farglory Dome.
- Kaohsiung Wei-Wu-Ying Center for the Arts Roof Project.
- Changhua District Court Relocation Office of New Project.
- Taipei World Universiade Games Village Turnkey Project.