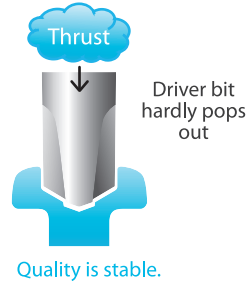


The Totsupura[®] can be tightened with a smaller thrust

NEW Totsupura[®]

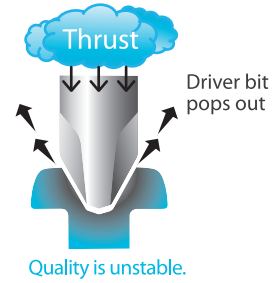
With the straight design screw, the upward component of force is not generated when the screw is rotated, and that won't cause cam out. Stable tightening is offered with smaller thrust.



Reduces fatigue of the operator

Conventional cross-recessed head screw

With the tapered design screw, the upward component of force is generated when the screw is rotated, and that causes cam out. To prevent cam out, the thrust needs to be applied from above when tightening the screw.

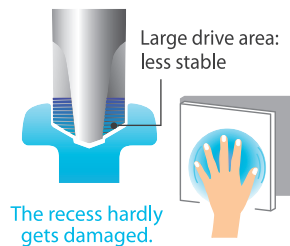


Increases fatigue of the operator

The Totsupura[®] prevents cam out.

NEW Totsupura[®]

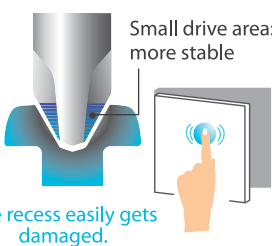
Because the drive area of a Totsupura screw is larger (twice that of a conventional screw), less force is applied per unit area. This causes less load to the screw and prevents stripping of thread and cam out.



Reduces operator stress

Conventional cross-recessed head screw

Because the drive area of a conventional cross-head screw is small, more force is applied per unit area. This causes more load to be applied to the screw and ultimately cam out due to stripped thread.

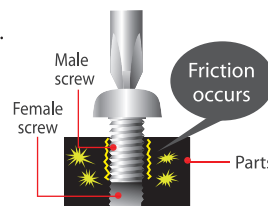


Increases operator stress

For example Pushing a door with 1 finger requires a lot of force and is unstable. However, pushing a door with an entire hand does not require so much force and the door can be pushed stably.

! Problems caused by too much thrust from above.

If the thrust from above is too strong, friction is caused in the contact points between male and female screws. This leads to screw tightening torque loss. In such condition, tightening torque becomes barely even, and by applying more thrust, the parts become contorted-this affects the accuracy of the finished product.



! Cam out line

Once cam out has occurred, a cam out line is left on the driver bit. If the damaged driver bit is continuously used, it will be deformed and worn further and cause cam out more often. This greatly compromises screw tightening quality and stability.

●Totsupura specifications

Screw standard	Precision Totsupura® JCIS standards (precision cross-recessed head screws)	Standard Totsupura® JIS standards (cross-recessed head screws)								
Application	Palm-size digital products	A wide range of assemblies from digital electrical appliances to automobiles								
Features of the screws	Ideal for product exterior: with a super-flat screw head, the surface after screw tightening becomes almost flat-with a smoother look and feel. There is less chance of damaging the screw head.	Ideal for product exterior: there is less chance of damaging the screw head.								
Examples of main applications	Precision equipment, single reflex cameras, replaceable lenses, digital cameras, MD and radio-cassette players, portable MD/CD, digital video cameras, DVD players, DVD recorders, electronic dictionaries, MO drives, CD-R/RW drives, mobile phones, FDD, HDD, watches, measuring instruments, optical pickups, etc.	Liquid crystal television, plasma television, video decks, fridges, washing machines, air conditioners, microwave ovens, cordless telephones, FAX, complex equipment, TV games, desk top PCs, notebook PCs, PC audio, printers, scanners, hard disks, car navigation systems, automotive components								
Kind of screws and appearance	<div><div>PAN Head Screw</div><div>BIND Head Screw</div><div>TRUSS Head Screw</div><div>FLAT Head Screw</div><div>OVAL Head Screw</div><div>Brazier Head Screw</div><div>SQUARE Head Screw</div><div>ULTRAT HIN Head Screw</div></div>	<table><tr><td>Material</td><td>Iron, Brass, Stainless</td></tr><tr><td>Shape</td><td>Small Screw Tapping Screw,Forming Screw</td></tr><tr><td>Cross hole No.</td><td>According to the ISO std. Camera std.</td></tr><tr><td>Size</td><td>M1.6-M6.0 Camera std,ISO STD</td></tr></table>	Material	Iron, Brass, Stainless	Shape	Small Screw Tapping Screw,Forming Screw	Cross hole No.	According to the ISO std. Camera std.	Size	M1.6-M6.0 Camera std,ISO STD
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Catalog No. EK-F001 10A

●Specifications and design are subject to change without notice. ●Catalog details current as of October, 2010.

HIOS[®]

HIOS PAT. Screw



TOTSUPURA[®] PAT.

A newly designed cross-recessed head screw
The Totsupura[®] screws prevent screw tightening errors, and stabilize quality, improve productivity, and reduce your production costs.



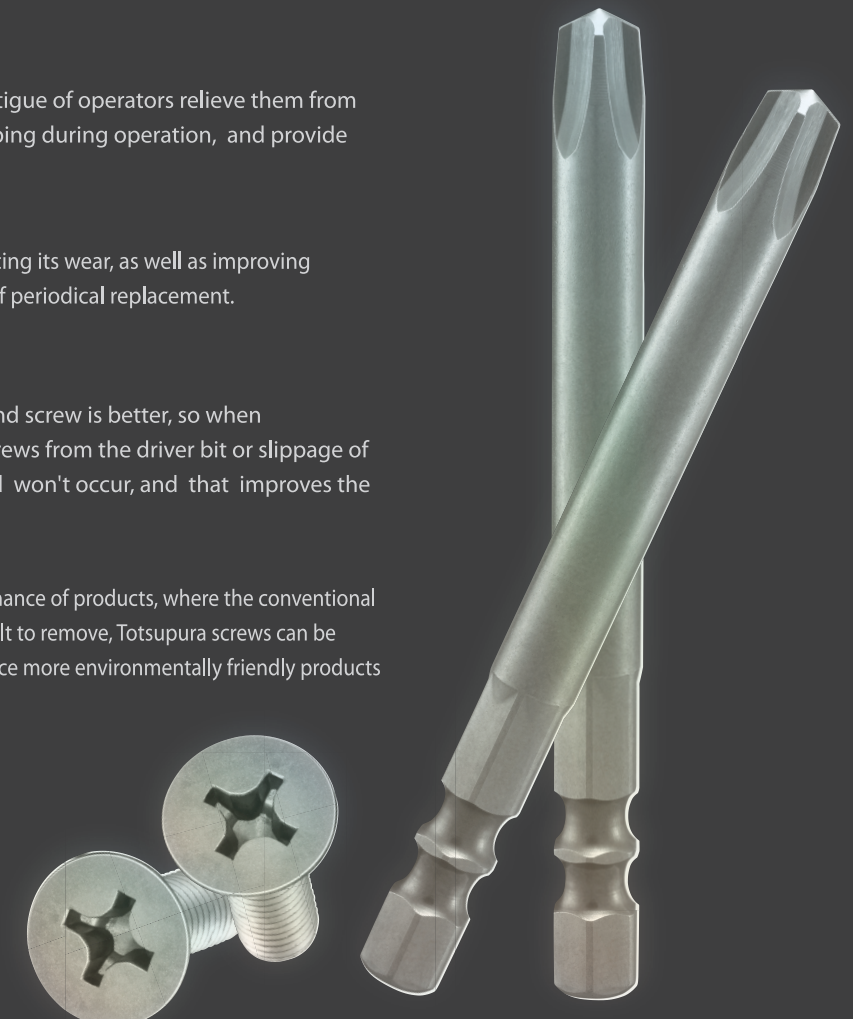
While ensuring compatibility with conventional cross-recessed head screws, Totsupura screws improve torque transmission efficiency and offer more stable screw tightening with smaller force.

Prevent cam out and reduce fatigue of operators relieve them from the concern about thread stripping during operation, and provide better working environment.

Extend life of a driver bit by reducing its wear, as well as improving productivity by standardization of periodical replacement.

The fit between the driver bit and screw is better, so when unexpected dropping of the screws from the driver bit or slippage of the driver bit off the screw head won't occur, and that improves the work efficiency.

In the recycling process or maintenance of products, where the conventional cross-recessed head screw is difficult to remove, Totsupura screws can be easily removed this helps to produce more environmentally friendly products



Comparison of shape of the recess and the driver bit

Is stable Quality Control possible with conventional ideas and concepts?

Screw is one of the most fundamental components that controls quality of products. Totsupura® screws, with a little improvement in the recess of conventional cross-recessed screws, offer highly reliable fastening and "stable quality control".



Figure1		New Totsupura® Screw	Conventional cross-recessed head screw
Center of the recess Figure1	Shape	No change in the shape of the center	
	Effect	Ensures compatibility	
Angle of the 4 wings Figure1	Angle	88°	92°
	Effect	<div><div>1</div><div>The width of the tip of the 4 wings is large.</div></div> <div><div>2</div><div>An inward force acts, so the fastening force increases and becomes stable.</div></div> <div><div>→</div><div>The contact area between the driver bits and screws approximately doubles, and force transmission efficiency is improved.</div></div> <div><div>→</div><div>Tightening torque becomes even, and the quality becomes stable.</div></div> <div><div>→</div><div>The fit between driver bits and screws is better, so wear of the bit is reduced.</div></div>	<div><div>1</div><div>The width of the tip of the 4 wings (n) is narrow.</div></div> <div><div>2</div><div>An outward force acts, so the fastening force decreases and becomes unstable.</div></div> <div><div>→</div><div>The contact area between the driver bits and screws is small, and force transmission is inefficient.</div></div> <div><div>→</div><div>There is variation in the tightening torque, so quality is unstable.</div></div> <div><div>→</div><div>The fit between the driver bits and screws is poor and that causes wear of the bits.</div></div>
Tip Figure2	Angle	Near 0°	26° 30'
	Effect	<div><div>1</div><div>With the near-straight design, upward component of force doesn't occur when a rotational force is applied to the screw. This prevents cam out, because driver bit hardly pops up.</div></div> <div><div>2</div><div>Because the driver bit hardly pops out, thread stripping, wear and deformation of the tip of driver bit can be minimized.</div></div> <div><div>3</div><div>Because there is no cam out, damage to your products can be prevented.</div></div> <div><div>4</div><div>Because the driver bit hardly pops out, it doesn't have to be strongly pushed against the screw-this greatly reduces a thrust (pushing force).</div></div> <div><div>→</div><div>Reduces fatigue of the operator.</div></div>	<div><div>1</div><div>With the tapered design, upward component of force occurs when a rotational force is applied to the screw. This causes cam out, because driver bit pops up.</div></div> <div><div>2</div><div>Because the driver bit pops out while rotating, thread stripping, wear and deformation of the tip of driver bit often occur.</div></div> <div><div>3</div><div>Due to cam out, the screw is displaced from the driver bit. This causes damage to the products.</div></div> <div><div>4</div><div>Because the driver bit tends to pop out, the operator has to strongly push it against the screw while controlling a thrust (pushing force) so now and then.</div></div> <div><div>→</div><div>Increases fatigue of the operator.</div></div>

Figure2		New Totsupura® Screw	Conventional cross-recessed head screw
Drive area Figure2	Area	Twice of conventional screw	Small
	Effect	<div><div>1</div><div>Drivability is good (straight)</div><div>→ Fit between the driver bit and screw is good.</div></div> <div><div>2</div><div>Driving force of the screw per unit area is small. This helps to extend life of the driver bit because of reduced wear.</div><div>→ The driver bits and screws hardly get damaged.</div><div>→ Wear is greatly reduced, so there is no need for changing material to increase hardness. This also helps to replace the bit periodically and to improve productivity.</div></div> <div><div>3</div><div>The fit between the driver bit and screw is better, so the driver bit doesn't wobble, the screw tightening operation is stable, and loss in production can be reduced.</div></div>	<div><div>1</div><div>Drivability is poor (erratic)</div><div>→ Fit between the driver bit and screw is poor</div></div> <div><div>2</div><div>Driving force of the screw per unit area is large. This reduces life of the driver bit because of increased wear.</div><div>→ The driver bits and screws are easily damaged.</div><div>→ To prevent wear, bit makers increase the hardness of the material for example, but it makes the bit more breakable, uncertain of its life and hard to know timing of replacement.</div></div> <div><div>3</div><div>The fit between the driver bit and screw is poor which causes screw tightening errors and loss in production.</div></div>