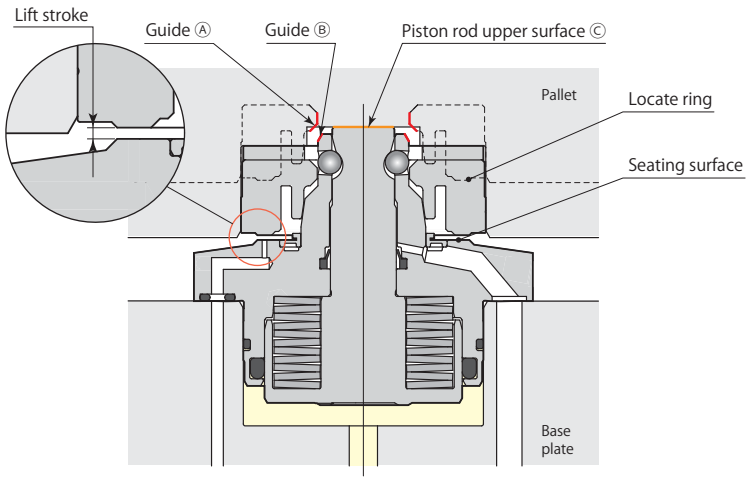
Pallet setting

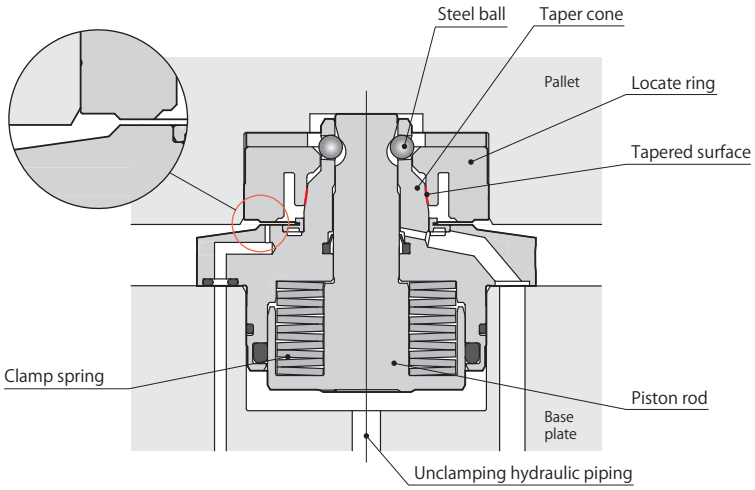
- Bring the pallet above the base plate. After positioning, lower the pallet. Pallet descends along guides Ⓐ & Ⓑ and stops after coming into contact with piston rod upper surface Ⓒ, making pallet setting easy. Furthermore, since locate ring does not come into contact with seating surface of pallet clamp, damages on seating surface can be prevented during pallet exchanges.



XY axes positioning

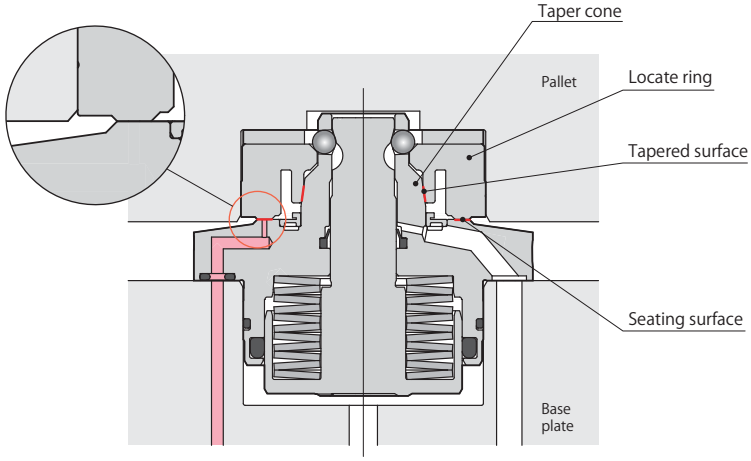
- When the unclamping hydraulic pressure is released, piston rod goes down by spring force* and radially extends the steel balls, pulling down the locate ring. The locate ring and taper cone at pallet clamp come into contact.

  ∗: For only model CPC. The piston rod in CPH goes down by the hydraulic force, the piston rod in CPY goes down by air force.



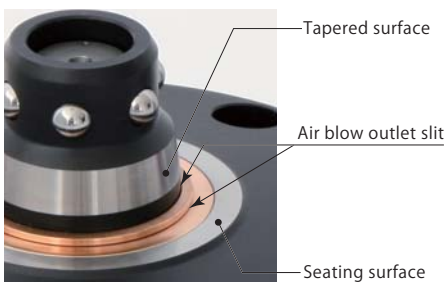
XYZ axes positioning (clamping is completed)

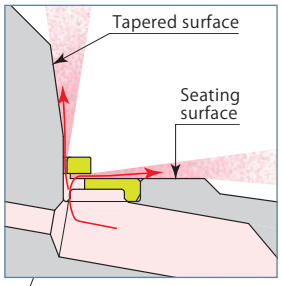
- The locate ring that is attached to tapered surface of taper cone is expanded and deformed in radial direction to firmly position X axis and Y axis.
  Locate ring is attached to seating surface and positions Z axis. The positioning of X, Y and Z axes by tapered surface and seating surface completes the XYZ positioning (dual surface positioning).

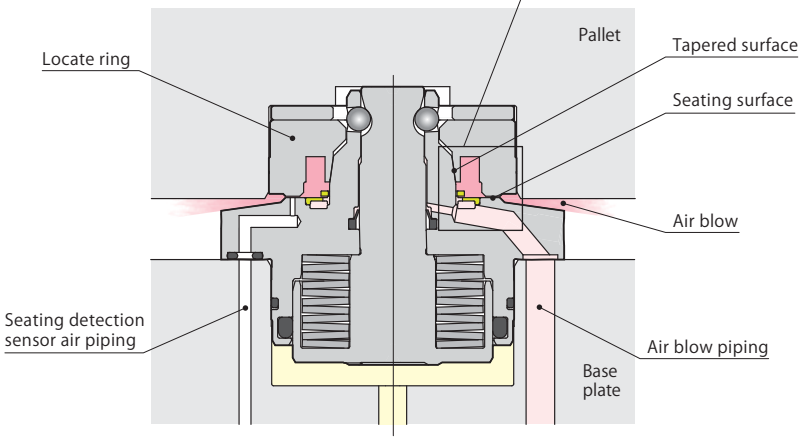


High repeatability and retention of accuracy

- Air blows out of wide slits laid out over circumference to tapered surface and seating surface directly for ensuring prevention of foreign substances.
- Since seating detection function is provided, it is possible to prevent operation with incomplete clamping due to insertion of metal chips.
- Rust proofing has been implemented to locate ring in order to prevent rusting while pallet is in storage or on standby.
- All machined parts related to dual surface positioning are made using a high-precision grinding machine in a temperature control room to improve the accuracy of the parts.

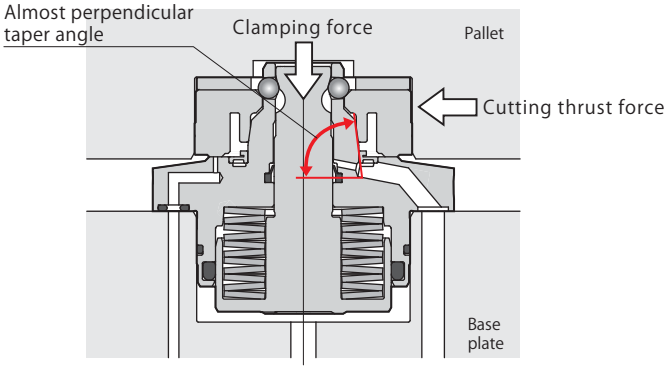






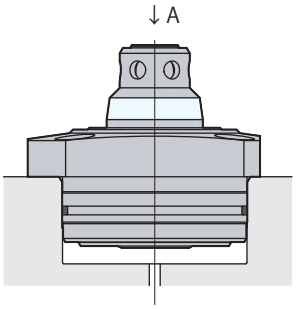
Taper angle that withstands large cutting thrust force

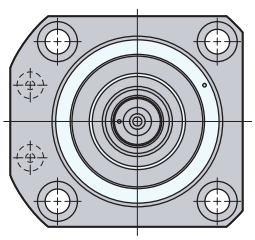
- Pallet clamp has tapered surface angle that is close to perpendicular, which allows for stable clamping with minimal impact from thrust exerted during cutting process. This is particularly effective in inhibiting chatter when cutting process at higher locations on the pallet, which improves processing conditions for high-speed cutting and heavy duty cutting.



Rectangular flange (made to order)

- A rectangular flange, created by cutting out mounting flange portion of pallet clamp body, is available (made to order). Inquire for details.





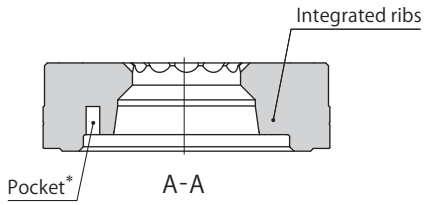
Arrow A view

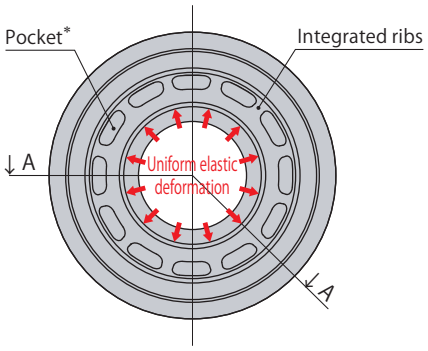
Solid tapering method with superior durability and repeatability

- Solid tapering type locate ring has no sliding portion for its positioning structure. Advantageous in terms of durability as well as in keeping the initial repeatability for a long time.
- When positioning X & Y axes, the taper portion evenly and elastically deforms outwards to offer highly accurate positioning. Furthermore, the taper portion has no slits, eliminating accuracy issues relating to positioning due to intrusion of metal chips into slits.
- Elastic deformation of taper portion is conducted evenly due to the integrated ribs that are evenly distributed in the radial direction providing high clamping rigidity.

∗: No pockets are provided with the model CPS-E25 and CPS-E40 because elastic deformation is easily obtainable at tapered part due to its body size.

Solid tapering type
model CPS-E



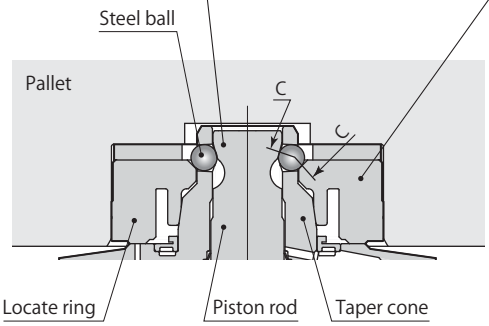


Specialized design reduces surface contact pressure and prevents deterioration of clamping force

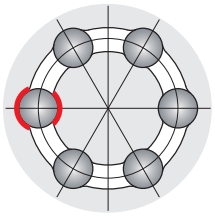
- Pallet clamp enhances output of clamp piston and firmly secures pallet. Steel ball contacting portions, where high surface pressure is exerted, have been designed in a special form that prevents indentation marking, which can deteriorate the clamping force, thereby making it possible to firmly fix pallets over long periods of time.

Special shape of piston rod
(steel ball contacting portions)

Special shape of locate ring
(steel ball contacting portions)

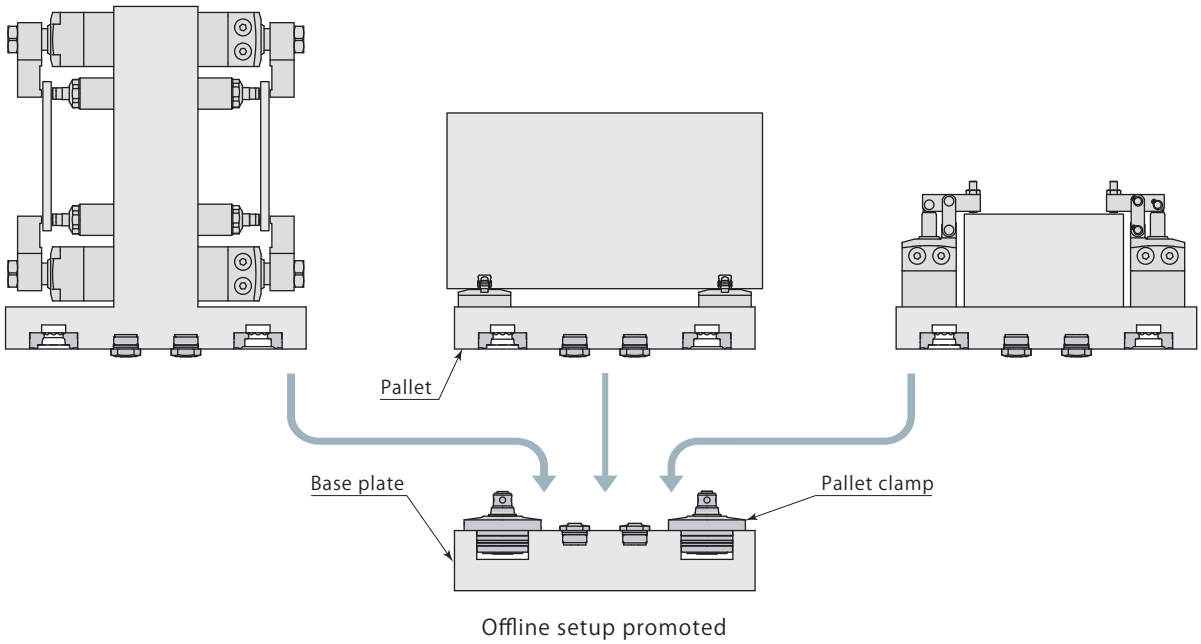


C-C



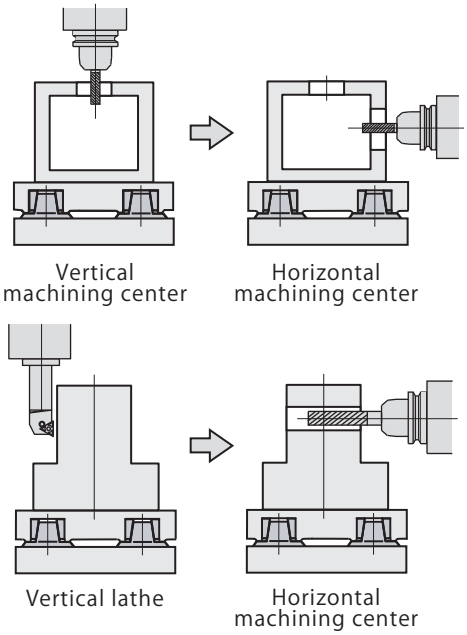
Contact portions to steel balls are line contacts, with lower surface pressure, thus initial clamping force is sustained for a long time.

Exchanges of jigs and workpieces are easy with Pal system



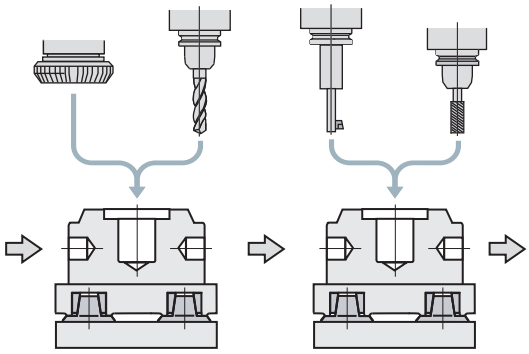
- Implementation of Pal system makes it possible to perform setting of workpiece on jigs of machine table accurately and significantly reduces setup time that was previously necessary for alignment.

Multifaceted machining with high accuracy is easy



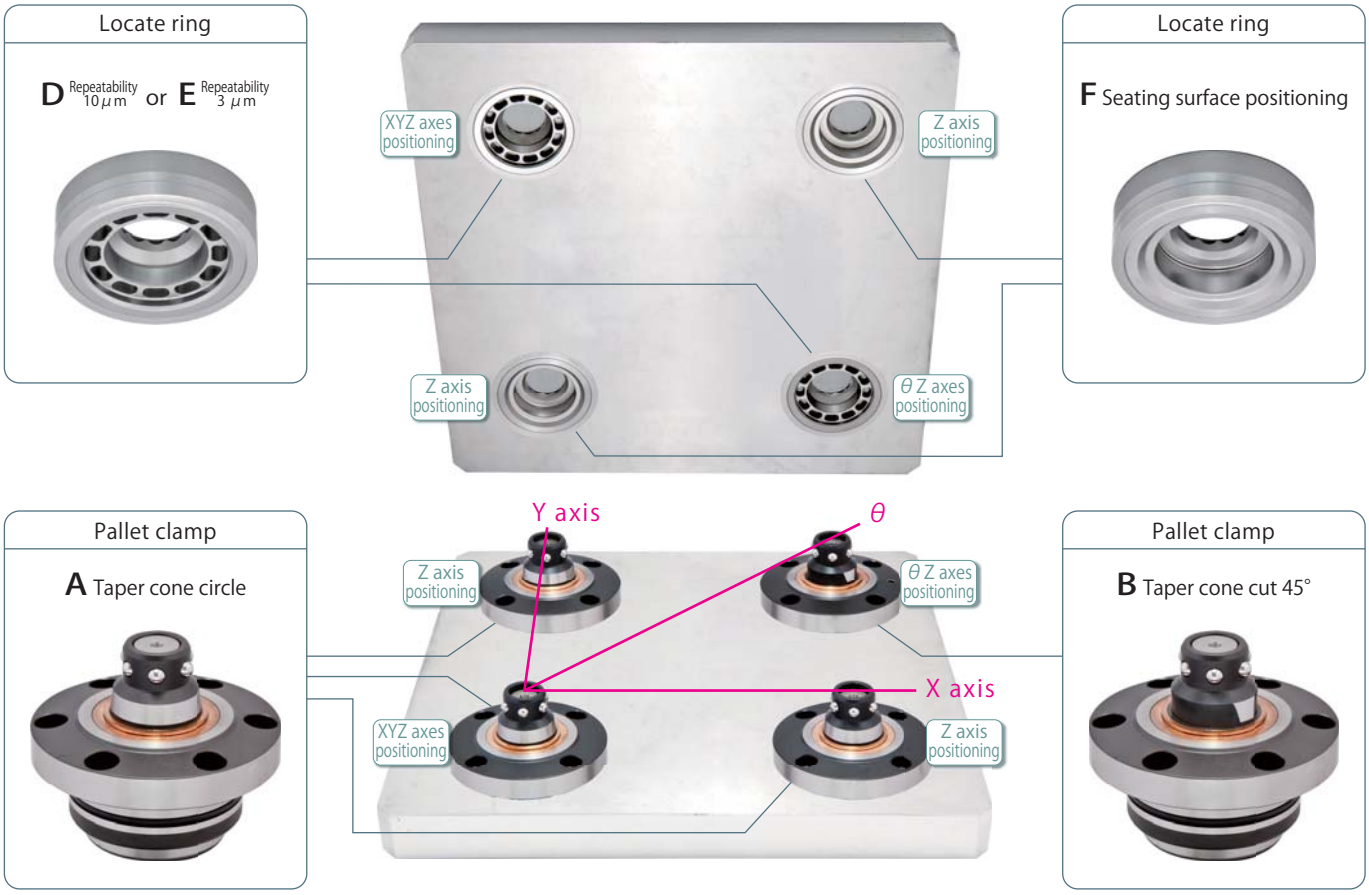
- Since workpieces do not have to be dismounted from pallets, continuous operations through multiple machines are possible. Highly accurate, multifaceted machining is possible with the Pal system.

Process division is easy (pallet transfer method)

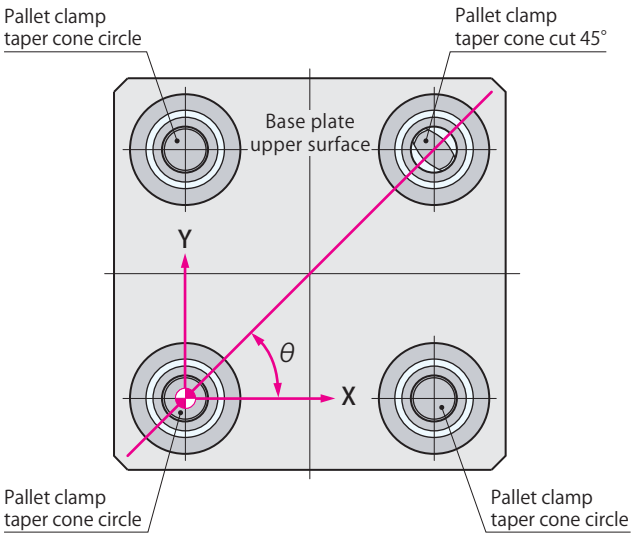


- Highly accurate positioning of Pal system makes it possible to distribute processes. This advantage allows a flexible allocation of machining process, which needs a very high accuracy. This flexibility makes it easier to unify tact time among all machines, leading to even distribution of load among machines to raise productivity.
- With pallet transfer method, mixed production of workpieces can be done easily.
- Workpieces are fixed onto the pallet before transferring, thus clamp time is short and problems relating to clamping can be mitigated at each machine.

Pallet clamp configuration pattern 1

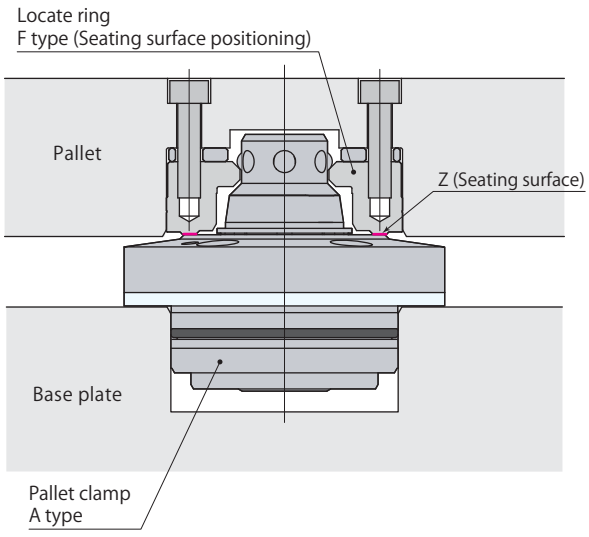


θ X Y axes positioning by tapered surface



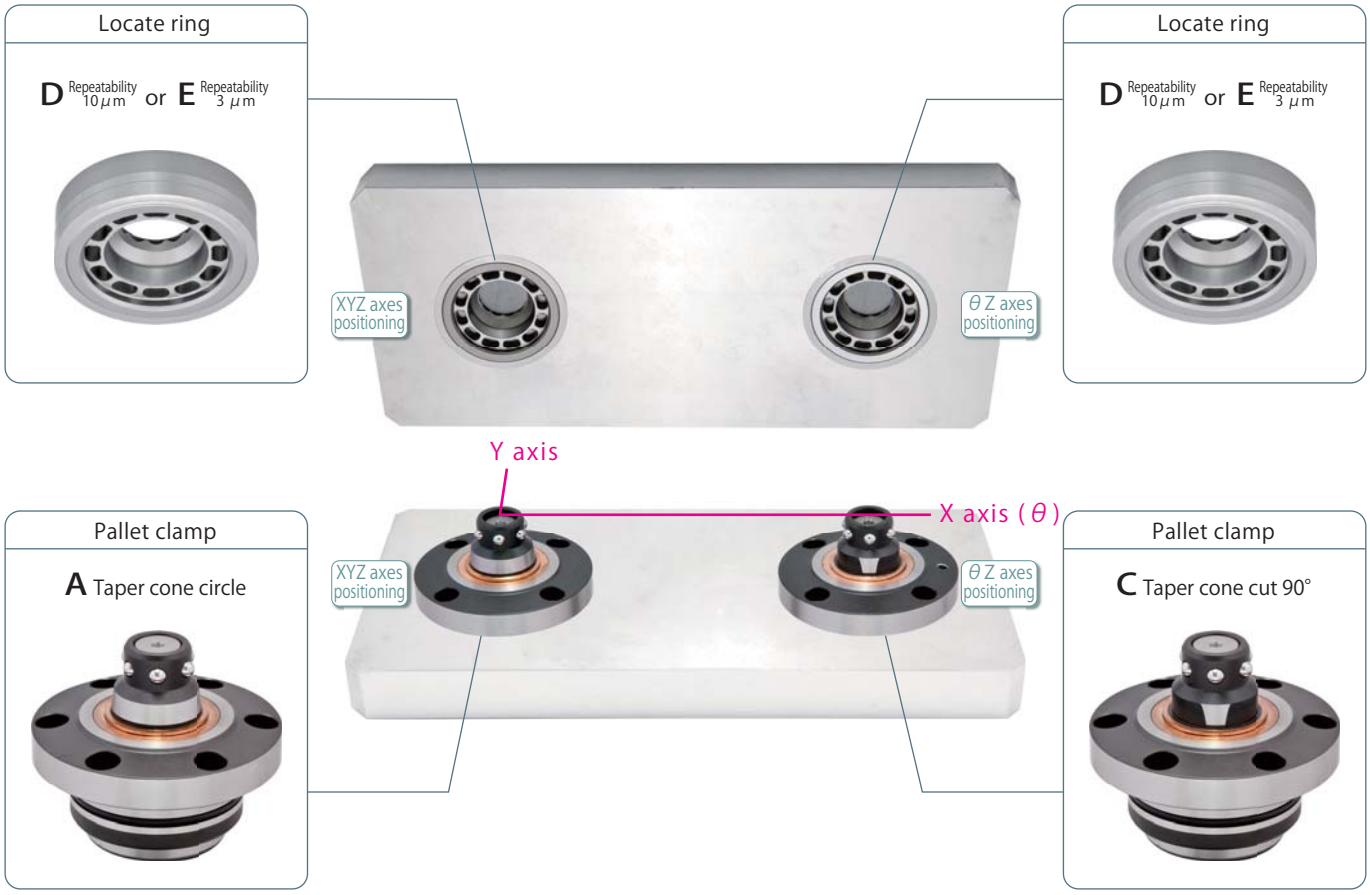
The pitch error between XYZ axes positioning pallet clamp and θ Z axes positioning pallet clamp is tolerated by cut type taper cone even under thermal change conditions.

Z axis positioning by seating surface

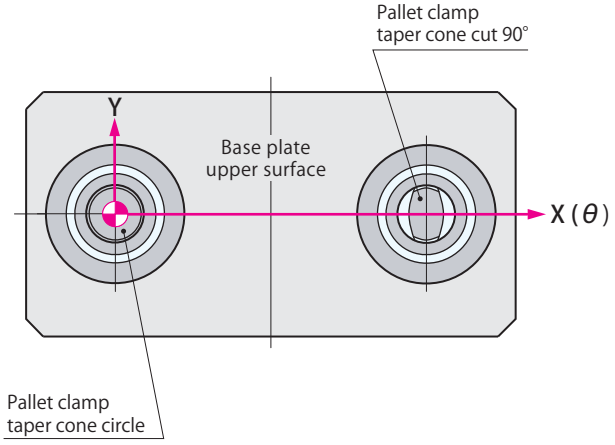


Since Z axis is positioned by 4 points of seating surface with no effect from pitch error, surface accuracy of pallet is sustained at high levels.

Pallet clamp configuration pattern 2

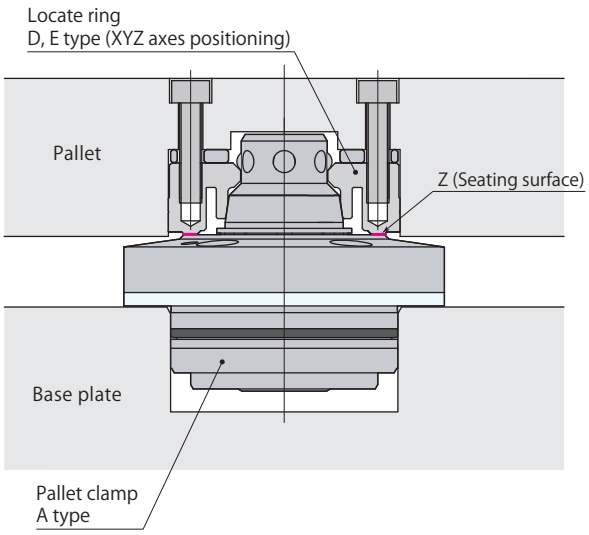


θXY axes positioning by tapered surface



The pitch error between XYZ axes positioning pallet clamp and θZ axes positioning pallet clamp is tolerated by cut type taper cone even under thermal change conditions.

Z axis positioning by seating surface



Since Z axis is positioned by 2 points of seating surface with no effect from pitch error, surface accuracy of pallet is sustained at high levels.