| | | | H6 | H7 | H8 | H9 | Applicable part | Functional classification | | Application example |
|---|---|---|---|---|---|---|---|---|---|---|
| Parts can move relative to each other | Clearance fit | Loose fit | | | | c9 | Part which accommodates a particularly wide gap, or a moving part which requires a gap<br>Part which accommodates a wide gap to facilitate assembly<br>Part which requires an appropriate gap even at high temperatures | Part which for functional reasons requires a large gap<br>{ Expands. Large positional error.<br>{ Long fitting length | | Piston ring and piston ring groove<br>Fitting by means of a loose set pin |
| | | Loose roll fit | | | d9 | d9 | Part which accommodates a wide gap, or which requires a wide gap | Cost needs to be reduced.<br>{ Manufacturing cost<br>{ Maintenance cost | | Crank web and pin bearing (side)<br>Exhaust valve box and spring bearing sliding part<br>Piston ring and piston ring groove |
| | | Loose roll fit | | e7 | e8 | e9 | Part which accommodates a fairly wide gap, or a moving part which requires a gap<br>Fairly wide gap and well lubricated bearing<br>Bearing subjected to high temperature, high speed, and high load (high-degree forced lubrication) | Regular rotating or sliding part<br>(Must be well lubricated.) | | Fitting of exhaust valve seat<br>Main bearing for crankshaft<br>Regular sliding part stripper bolt MSB (e9) |
| | | Roll fit | f6 | f7 | f7<br>f8 | | Fitting which provides an appropriate clearance and permits movement (high-quality fitting).<br>Regular normal-temperature bearing lubricated with grease or oil | Regular fitting part<br>(is often disassembled) | | Part where a cooled exhaust valve box is inserted<br>Regular shaft and bushing<br>Link device lever and bushing |
| | | Tight roll fit | g5 | g6 | | | Continuously rotating part of a precision machine under light load<br>Fitting with a narrow gap and which permits movement (spigot, positioning)<br>High-precision sliding part | Part requiring precision motion with almost no gap | | Link device pin and lever<br>Key and key groove<br>Precision control valve rod Guide lifter pin (g6) |
| Parts cannot move relative to each other. | Transition fit | Sliding fit | h5 | h6 | h7<br>h8 | h9 | Fitting which allows movement by hand when a lubricant is used (high-quality positioning)<br>Special high-precision sliding part<br>Unimportant stationary part | Difficult to disassemble without damaging the part. | Fitting force alone is insufficient for transmitting force | Fitting of rim and boss<br>Fitting of gears in a precision gear device<br>Dowel pin MSTH (h7) |
| | | Push fit | h5<br>h6 | js6 | | | Installation part which is compatible with a very small tightening interference<br>High-precision positioning which locks both parts in place while unit is in use<br>Fitting which can be assembled/disassembled using a wooden or lead hammer | | | Fitting two coupling flanges<br>Governor path and pin<br>Fitting of gear rim and boss |
| | | Striking | js5 | k6 | | | Fitting which requires an iron hammer or hand press for assembly/disassembly (A key or other device is required in order to prevent inter-part shaft rotation.)<br>Precision positioning | | | Fitting of gear pump shaft and casing<br>Reamer bolt |
| | | Striking | k5 | m6 | | | Assembly/disassembly are the same as the above.<br>Precision positioning which permits no gap at all | | | Reamer bolt Dowel pin MSTM (m6)<br>Fastening of hydraulic device pistons and shafts<br>Fitting of coupling flange and shaft |
| | | Light press fit | m5 | n6 | | | Fitting which requires considerable force for assembly/disassembly<br>Precision stationary fitting (A key or other device is required for high-torque transmission purposes.) | | Fitting force along is sufficient for transmitting small force | Fitting of flexible shaft coupling and gear (passive side)<br>Precision fitting Punch SPAS, etc. (m5)<br>Insertion of suction valve and valve guide Die MHD, etc. (m5) |
| | Interference fit | Press fit | n5<br>n6 | p6 | | | Fitting which requires large force for assembly/disassembly (A key or other device is required for high-torque transmission purposes.)<br>However, only light press-fitting force is required for press-fitting when both parts are non-ferrous parts.<br>Fastened using the standard press-fitting for fastening a ferrous part to a ferrous, bronze, or copper part | Difficult to disassemble without damaging the part. | | Insertion of suction valve and valve guide Straight die MSD, etc. (n5)<br>Fixing a gear and shaft together (small torque) Dowel pin MST (p6)<br>Flexible coupling shaft and gear (drive side) |
| | | Press fit | p5 | r6 | | | Assembly/disassembly are the same as the above.<br>Shrinkage press fitting, cold press fitting or forced press fitting is required for large parts | | | Coupling and shaft |
| | | Strong press fit, shrinkage press fit, cold press fit | r5 | s6<br>t6<br>u6<br>x6 | | | Permanent assembly in which parts are both tightly fastened together and will not be disassembled, and which requires shrinkage press fitting, cold press fitting, or forced press fitting. For light alloys, only ordinary press fitting is required. | | Fitting force is capable of transmitting considerable force | Fitting and fixing a bearing bushing<br>Insertion of suction valve and valve seat<br>Fixing a coupling flange and shaft together (large torque)<br>Fixing a drive gear rim and boss together<br>Fitting and fixing a bearing bushing |

The items printed in red in the Application example are press die parts presented in this catalogue.

### 1.1 Fitting with regularly used hole adopted as reference

| Reference hole | Shaft tolerance range class | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Clearance fit | | | | | | Transition fit | | | Close fit | | | | | | | |
| H6 | | | | | | g5 | h5 | js5 | k5 | m5 | | | | | | | |
| | | | | | f6 | g6 | h6 | js6 | k6 | m6 | n6 * | p6 * | | | | | |
| H7 | | | | | f6 | g6 | h6 | js6 | k6 | m6 | n6 | p6 * | r6 * | s6 | t6 | u6 | x6 |
| | | | | e7 | f7 | | h7 | js7 | | | | | | | | | |
| H8 | | | | | f7 | | h7 | | | | | | | | | | |
| | | | | e8 | f8 | | h8 | | | | | | | | | | |
| | | | d9 | e9 | | | | | | | | | | | | | |
| H9 | | | d8 | e8 | | | h8 | | | | | | | | | | |
| | | c9 | d9 | e9 | | | h9 | | | | | | | | | | |
| H10 | b9 | c9 | d9 | | | | | | | | | | | | | | |

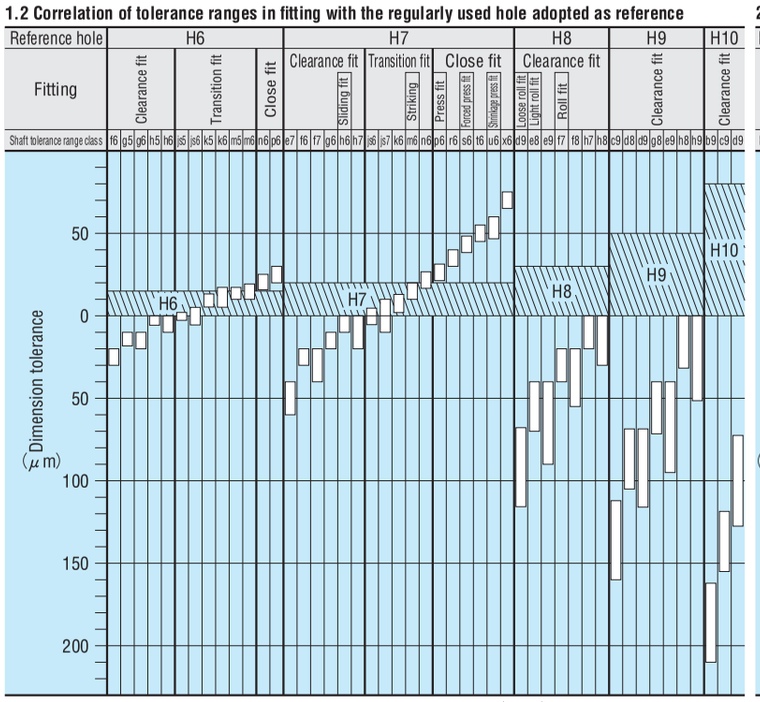
Note: * Exceptions for these fittings may arise depending on the dimensional sectioning scheme.

### 2.1 Fitting with regularly used shaft adopted as reference

| Reference shaft | Hole tolerance range class | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Clearance fit | | | | | | | Transition fit | | | Close fit | | | | | | |
| h5 | | | | | | | H6 | JS6 | K6 | M6 | N6 * | P6 | | | | | |
| h6 | | | | | F6 | G6 | H6 | JS6 | K6 | M6 | N6 | P6 * | | | | | |
| | | | | | F7 | G7 | H7 | JS7 | K7 | M7 | N7 | P7 * | R7 | S7 | T7 | U7 | X7 |
| h7 | | | | E7 | F7 | | H7 | | | | | | | | | | |
| | | | | | F8 | | H8 | | | | | | | | | | |
| h8 | | | D8 | E8 | F8 | | H8 | | | | | | | | | | |
| | | | D9 | E9 | | | H9 | | | | | | | | | | |
| h9 | | | D8 | E8 | | | H8 | | | | | | | | | | |
| | | C9 | D9 | E9 | | | H9 | | | | | | | | | | |
| | B10 | C10 | D10 | | | | | | | | | | | | | | |

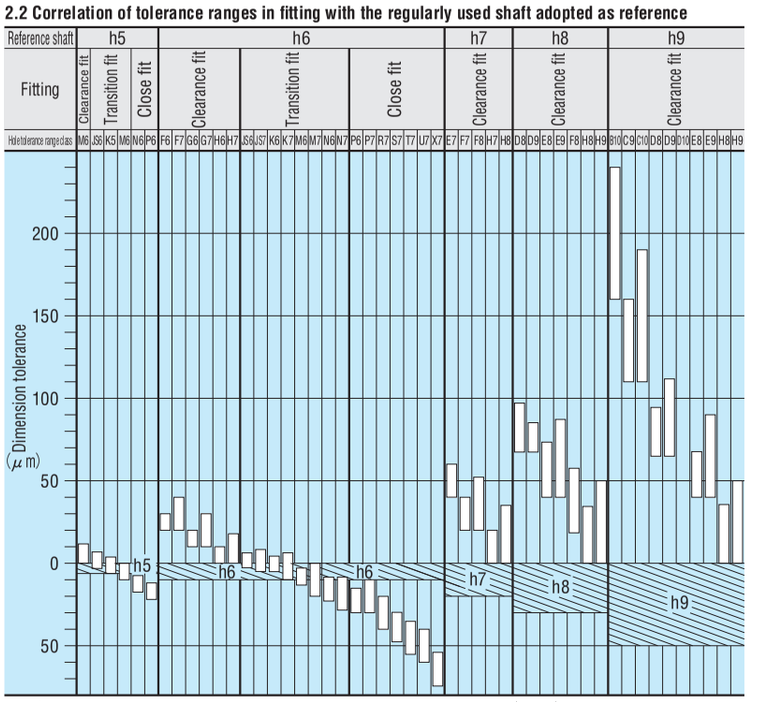
Note: * Exceptions for these fittings may arise depending on the dimensional sectioning scheme.

### 1.2 Correlation of tolerance ranges in fitting with the regularly used hole adopted as reference




* Cases in which the measurement exceeds the reference dimension in the above table (18mm) but does not exceed 30mm.

### 2.2 Correlation of tolerance ranges in fitting with the regularly used shaft adopted as reference




* Cases in which the measurement exceeds the reference dimension in the above table (18mm) but does not exceed 30mm.