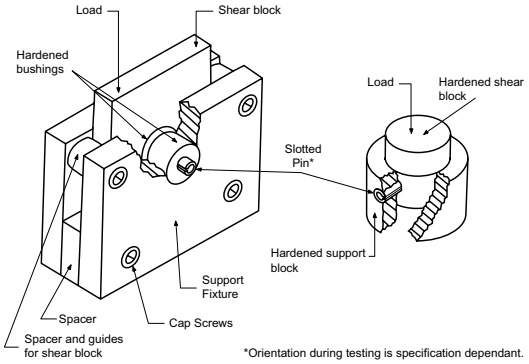
SPIROL® TECHNICAL INFORMATION

SHEAR STRENGTH

The shear test procedure is set forth in ISO 8749, ASME B18.8.2, ASME B18.8.4M, SAE J496, and NASM 10971, which are identical in substance.



Typical pin shear test fixture

Shear values specified will only be obtained under the conditions noted in the referenced standards. Of special note:

- The clearance at the shear plane cannot exceed 0.15 mm or .005".
- The hole has to be the nominal pin diameter (tolerance H6) with a hardness of not less than HV 700.
- The shear planes have to be at least one pin diameter from each end, and at least two diameters apart.
- ISO 8752 pins are shear tested with the slot up, aligned with the shear load.
- ASME B18.8.2, ASME B18.8.4M, NASM 10971, and SAE J496 pins are shear tested with the slot rotated 90˚ to the shear load.

STRAIGHTNESS SPECIFICATION

(ASME PINS ONLY) The straightness over the length of the pins shall be such that the pin will pass freely through a ring gauge of the length and diameter as specified below.

STRAIGHTNESS GAUGE SPECIFICATIONS

Pin Length	Gauge Length	Maximum Pin Diameter Plus
Up to 24 mm	25 ± 0.15	0.20 – 0.22
Up to 1"	1" ± .005"	.007"
24 mm – 50 mm	50 ± 0.15	0.40 – 0.43
1" – 2"	2" ± .005"	.010"
Over 50 mm	75 ± 0.15	0.60 - 0.64
Over 2"	3" ± .005"	.013"

RECOMMENDED PIN/SHAFT RATIO

The recommended maximum ratio is 1 to 3; that is the pin diameter should never exceed 33.3% of the shaft diameter. If this limit is exceeded, the remaining material in the shaft is inadequate and the shaft will fail before the pin.

DOUBLE PINNING

In situations requiring exceptionally high shear strength, it is possible to use pins in combination by driving an inner pin into an already inserted outer pin. The gaps should be 180° opposed. The recommended hole needs to be increased. It is suggested you consult **SPIROL** Application Specialists in these situations.

WHICH STAINLESS?

Martensitic chrome stainless steel is hardened and has strength comparable to carbon steel. It also provides satisfactory corrosion resistance in most cases. Austenitic nickel stainless steel has better corrosion resistance in some environments but since it is not hardened, it has lower strength and requires more care in the insertion process.

HOLE PREPARATION

Holes can be drilled, punched or cast with no need for additional reaming or sizing. Care should be taken to avoid undersize holes to eliminate potential pin damage during insertion. The following points are suggested for your consideration:

- Break or debur the edges, particularly in case of hardened holes.
- Countersinking is not recommended if it increases the clearance at the shear plane.
- In case of cast or sintered metal holes, provide a lead-in radius.
- Whenever possible, punched holes should be punched in the same direction as the direction of pin insertion.
- Eliminate hole misalignment problems by drilling holes together.
- In case of hardened collars or similar components, flatten the component at the entry of the hole to avoid two-point contact as the pin starts into the hole.

SPECIALS

ISO 13337 (DIN 7346) SPECIFICATIONS

Nom. Pin Diameter	Expanded Diameter		Chamfer Length		Wall Thickness	Double Shear Strength Carbon & Martensitic S.S. Min. kN
	Min.	Max.	Min.	Max.	Nominal	
2	2.3	2.4	0.20	0.40	0.20	1.50
2.5	2.8	2.9	0.25	0.45	0.25	2.40
3	3.3	3.5	0.25	0.45	0.30	3.50
4	4.4	4.6	0.50	0.70	0.50	8.00
5	5.4	5.6	0.50	0.70	0.50	10.40
6	6.4	6.7	0.70	0.90	0.75	18.00
8	8.5	8.8	0.70	0.90	0.75	24.00
10	10.5	10.8	0.90	1.10	1.00	40.00

OTHER COMMON SPECIALS:

- **Special Lengths**
- **Special Materials**
- **Special Tolerances**
- **Special Finishes**
- **Special Packaging**

SPIROL®

Applications

SPIROL® slotted spring pins are used in many industries.

- Agriculture
- Automotive
- Construction
- Appliances
- Electronics
- Furniture
- Mining
- Plastics
- Railways
- Aerospace

Typical applications use spring pins as...

- Fasteners to secure handles and gears to shafts
- Retaining pins
- Axle shafts
- Stop pins
- Hinge and pivot applications
- Cross bars
- Tube reinforcing pins
- Locator pins

Challenge Us!

SPIROL Application Engineers will review your application needs and work with your design team to recommend the best solution. One way to start the process is to select **Pinning Applications** or **Installation Systems** in our **Optimal Application Engineering** portal at www.**SPIROL**.com

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