Difference Between Rc and PT

№ 055

【Question】

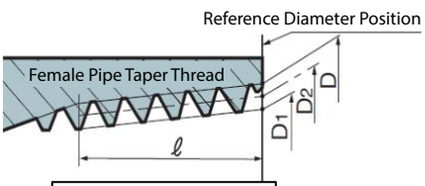
Could you explain this as simply as possible?
It seems that there are several types of pipe taper threads, such as: **PT / R / Rc**
In addition, taps are available in: **PT / S-PT / Rc**
I am completely confused about pipe taper threads and would like to understand the differences between these standards and thread types.

【Answer】

The relationship between **pipe taper threads** and **taps/dies** changed when the JIS standard was revised approximately 20 years ago.
However, the market is still in a transitional period, and both the old and new standards continue to coexist. As a result, the various thread designations and tap specifications can be quite confusing.
To make things easier to understand, let's first look at **female pipe taper threads** and taps in the simplest way possible before discussing the details.

【Explanation】

For female pipe taper threads, the former JIS standard used the designation: **PT1/2-14**
However, the current JIS standard uses: **Rc1/2-14**
Despite the change in designation, the actual thread dimensions remain exactly the same.
In other words: **PT1/2-14, Rc1/2-14**
represent identical female thread dimensions and are functionally equivalent.
An example of the **1/2-14** thread size is shown below for reference.
At this point, I hope the basic relationship between **PT** and **Rc** has become a little clearer.



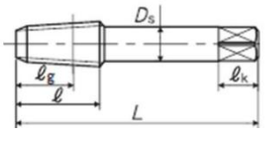
Female Thread Schematic Diagram

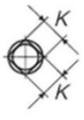
Unit(mm)

Standard	Designation	Reference Minor Diameter (D)	Minimum Effective Thread Length (ℓ)
Former JIS Standard	PT1/2-14	20.955	12.7
Current JIS Standard	Rc1/2-14	20.955	12.7

To inspect a **female pipe taper thread**, a **Pipe Taper Thread Plug Gauge** is used.
Today, both of the following gauges are available on the market: **PT1/2-14 Plug Gauge, Rc1/2-14 Plug Gauge**
Although their external appearance differs slightly, they are essentially equivalent in terms of thread inspection and dimensional verification.
Therefore, when properly understood and applied:
A **PT Plug Gauge** can inspect PT female threads., A **PT Plug Gauge** can inspect Rc female threads.,
An **Rc Plug Gauge** can inspect PT female threads., An Rc Plug Gauge can inspect Rc female threads.
This interchangeability is possible because the actual thread dimensions of PT and Rc are identical; only the designation changed from the former JIS standard to the current JIS standard.

Under the former **JIS standard,** two types of **pipe taper taps** were specified:
PT1/2-14 : Long Thread Type, **S-PT1/2-14** : Short Thread Type
However, under the current **JIS standard**, only one type is specified: **Rc1/2-14**
If the pilot hole is sufficiently deep and the tap does not bottom out, any of the following taps: PT, S-PT, Rc
can produce female taper threads that pass inspection using either: PT Pipe Taper Plug Gauge, Rc Pipe Taper Plug Gauge
In other words, all three tap types can generate acceptable pipe taper threads that meet the same inspection requirements.
The fundamental difference between **PT, S-PT**, and **Rc** taps is not the thread profile itself.
The primary difference is the ℓg (Gauge Position), which is the insertion depth required to reach the reference diameter position during tapping.
Please refer to the example for size **1/2-14** shown in the table below.





Product Type	Designation	Overall Length (L)	Thread Length (ℓ)	Reference Major Diameter (mm)	Reference Diameter Position (ℓg)	Shank Diameter	Square Width (K)	Square Length (ℓk)
Hand Tap	PT1/2-14	80	35	20.955	25	18	14	17
	S-PT 1/2-14	80	27	20.955	17	18	14	17
Hand Tap	Rc 1/2-14	87	26	20.955	20.5	18	14	17