

TAPS

Taps have become integral part of one's life, since they were introduced. *Could you now imagine a life without **Taps**?* Probably not. In morning unless water from tap cleans face sleepiness doesn't leave you.

One can live without food for 72 hours but one cannot live without water for even 24 hours. What is common source of water than a **ever-useful tap**. This is what attracted us to this usually neglected but extremely useful instrument.

Psychologically, the thing which is most commonly seen & used loses its significance. Layman is bound to think that tap design is extremely simple. *Does it mean that the thing commonly seen has to be trivial.* No, surely not. Many Engineering aspects go into the design of taps.

Tap designing is not a one step process. The generally used **plastic tap** forms the main basis of our study. But the evolution of this design is not instantaneous. **Plug Cock** was the prototype from which the present form evolves. **Brass Taps** which have more life than plastic counterparts are also studied as an extension.

By this extensive study of taps we gained knowledge about its functioning, assembly, and components. It is astonishing to see how cost reduction is brought about in *Indian Taps* to make it more accessible. Not all parts are made of **High Density Polythelene**. Two parts having regular sliding are made of differently to make less expensive part wear more. Some unimportant parts are even made of **Low Density Polythelene**(outer nut).

Thus high skills are involved in Tap designing. We studied most of those aspects & we plea you to bring into our notice the thing which we have missed or wrongly interpreted or stated.(FAQ's site has emailing facility).

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[COMPONENTS OF PLASTIC TAP](#)

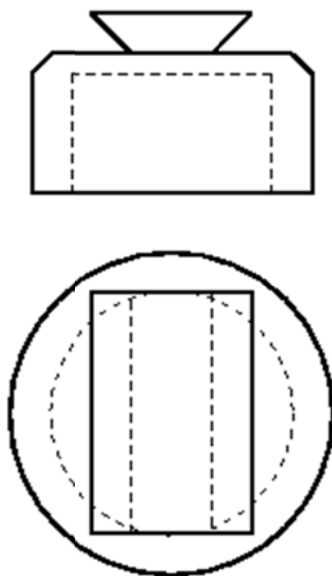
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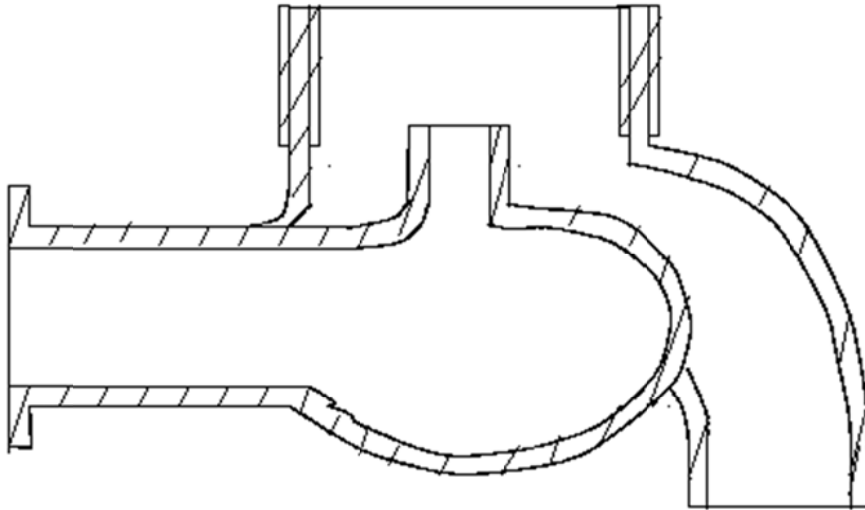
Valve Disc



Valve Disc is replaceable. It makes the actual contact with the seat on the main body thus stop the flow of water. To open the tap the disc is raised by rotating the hand wheel in the anticlockwise direction so that the stem is screwed out of the valve body alternatively clockwise rotation brings the valve disc into contact with the seat and thus closes the tap.

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Main Body



The main body has an opening for water inlet. Once the water enters into the main body it has to pass through the seat. As mentioned earlier the valve disc stops or lets the flow of water through this seat by pressing against it. Now once the water passes through the seat, it flows down to the water-outlet. Also on the upper side of the main body is attached the spindle assembly.

The main body has protruding parts having threads on both sides. *Outer threads* for holding the spindle assembly, to the main body. And *inner threads* is for the proper movement of the spindle.

Special attention must be paid to the fact that water outlet system has only a small opening through which water, seated in the groove (around the seat) oozes out.

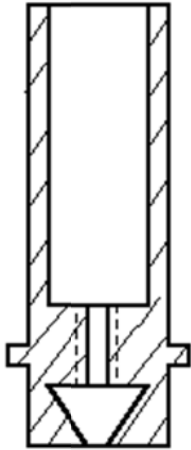
OUTER NUT



Outer Nut is used for holding the spindle assembly to the main body.

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Spindle



The section view of spindle shows square inner groove where the cap inner protrusion sits. Thus the two parts rotates as one. The cap is attached to spindle by a screw which sits on the threads in the spindle.

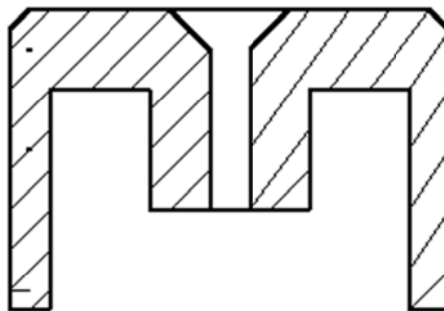
On the lower side there is a throu & throu groove on which sits & is used to raise & lower the valve.

It is fitted with **spindle cover** with the help of threads.

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It is
&
tap. It
on the outer
facilitating the
closing.(*Part of
Engineering*).



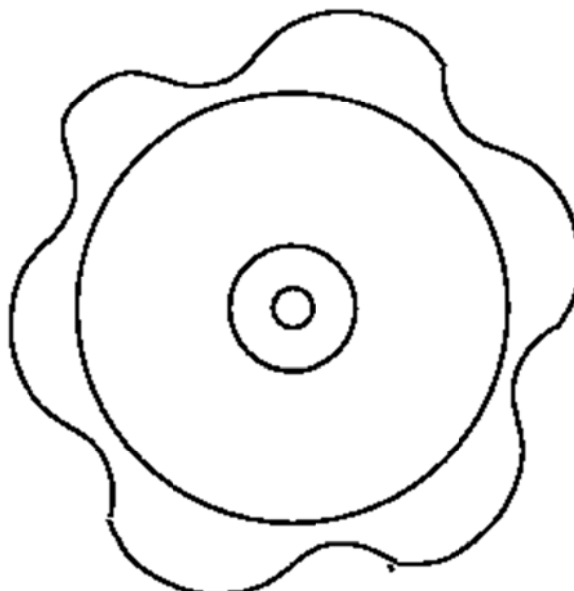
CAP

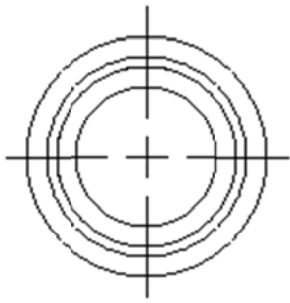
used to open
close the
has groove
surface for
opening &
Human

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Spindle

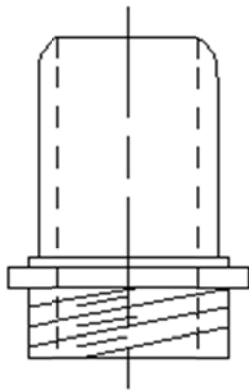
Cover



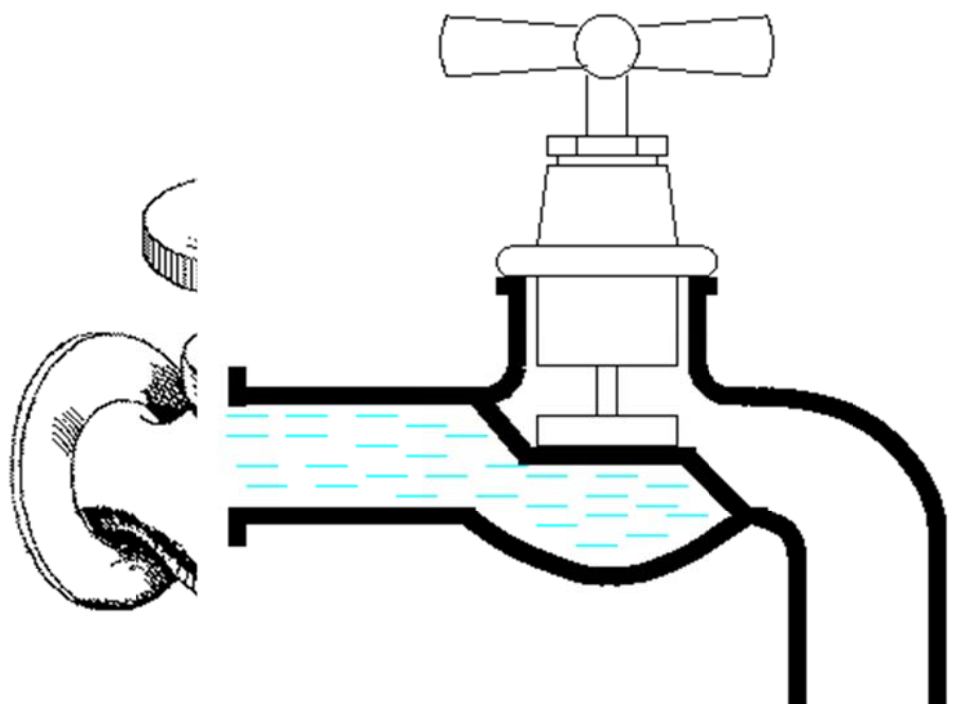


Spindle Cover is fitted with the **spindle** with the help of threads. It has threads on lower outer half. These threads are used to tighten the spindle assembly against the **main body**.

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How is TAP assembled



TAP ASSEMBLY

On spindle, spindle cover is put. This fit is press-fit. Then the outer nut is slid on the cover. The inner hole on the outer nut is of larger diameter than the diameter of the spindle cover.

By this arrangement we ensure that spindle can rotate freely once the outer nut is tightened to the main body.

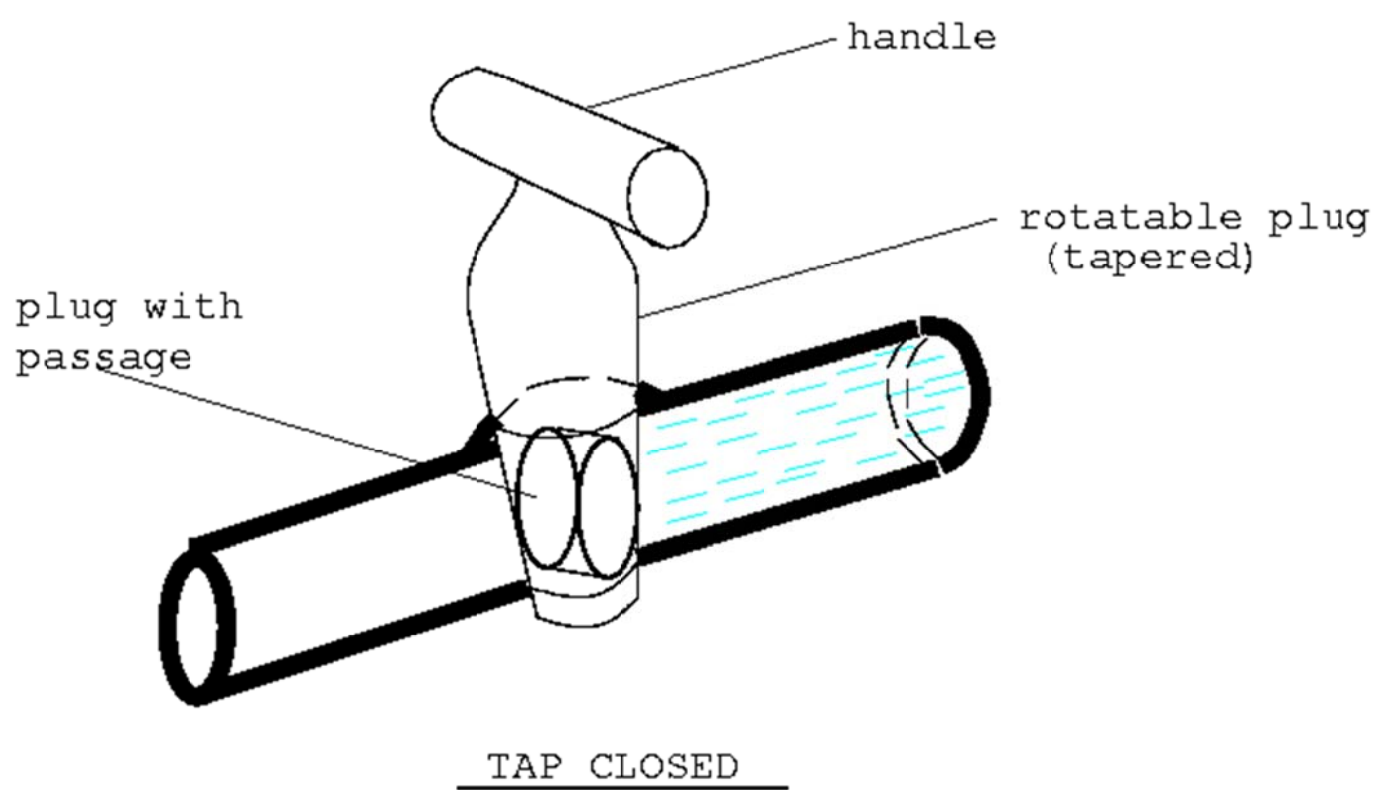
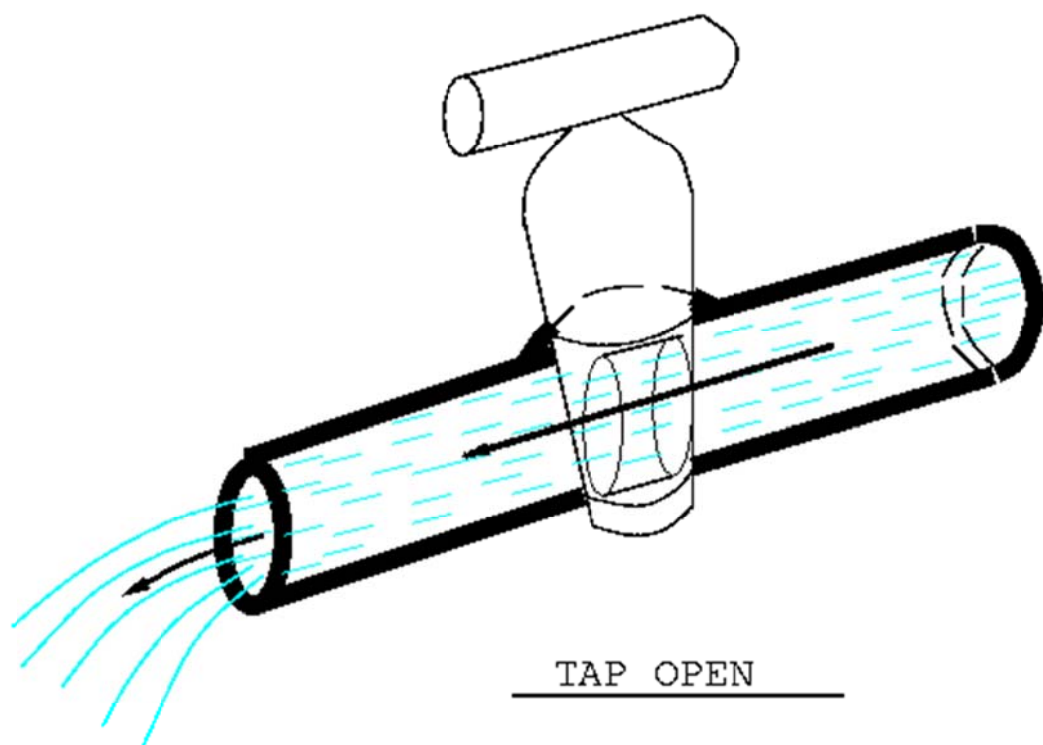
After that inserted the cap on the spindle so that the square male protrusion on the cap fits in its counterpart on the spindle. Then permanent connection is ensured by the help of screw. There are threads only on lower part of the spindle thus ensuring good connection between them.

Slide the valve disc on the groove on the lower portion of *the tap*.

Finally tighten the outernut on *the tap*. Ensure that they are tightly fitted so that this should not open by any means when *the tap* is operated. Though the clearance between the outernut and the spindle cover ensure this but other *elaborate* alternatives should also have to be ensured.

Now tighten the cap to lower the valve disc over the seat on the main body.

PLUG TAP



The working of *the plug tap* is easiest to analyse. As shown in the figure the fluid passes through a hole, in the **rotatable plug**. The rotating **plug** controls the flow of water. Rotation of 90°, from the closed position, aligns the passage to the tube axis, and hence the water flows.

Here some degree of control of water flow is innate in the construction of this tap. But it suffers from the disadvantage of leakage of water through the clearance between the **plug & the main body**.

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Material Study

Studying the mechanical aspects of the **tap**, without having an overview of the material properties would render our study incomplete.

Material Study for :-

1. [PLASTIC TAP](#)
2. [BRASS TAP](#)

PLASTIC TAP

Material Used:-

1. High Density Polyethylene (HDPE).
2. Linear Low Density Polyethylene (LLDPE).

Each of these are available in different grades & are priced in the range of Rs 60/ to Rs 80/ per kg.

Manufacturing Processes

The generally adopted manufacturing process for the manufacturing plastic component is the '*injection moulding*'. Though on the small scale the hand moulding process is used to manufacture small components , like *the outer nut* . Hand moulding is a cheaper process but the compromise has to be made on the quality as well as on the quantity of the product .

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BRASS TAP

WHY BRASS ? Although *stainless steel taps* are now the preferred choice over **the brass tap** because of the cost factor. But keeping into view the non-availability of corrosion resistant steels in the good old days taps were made out of brass mainly because of the corrosion resistance.

Manufacturing Process

The manufacturing process used in the manufacture of **the main body** as well as **the spindle**, is *DIE CASTING*.

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Frequently asked Questions on *TAPS*

Q: Type of threads commonly used on taps?

A: Right Handed.

Q: Why water doesnot comes out from any other part on tap?

A: Given on page 'HOW TAP IS ASSEMBLED'.

Q: Why outer nut doesnot open when tap is opened?

A: Given on page 'HOW TAP IS ASSEMBLED'.

For answers to other question mail your query.

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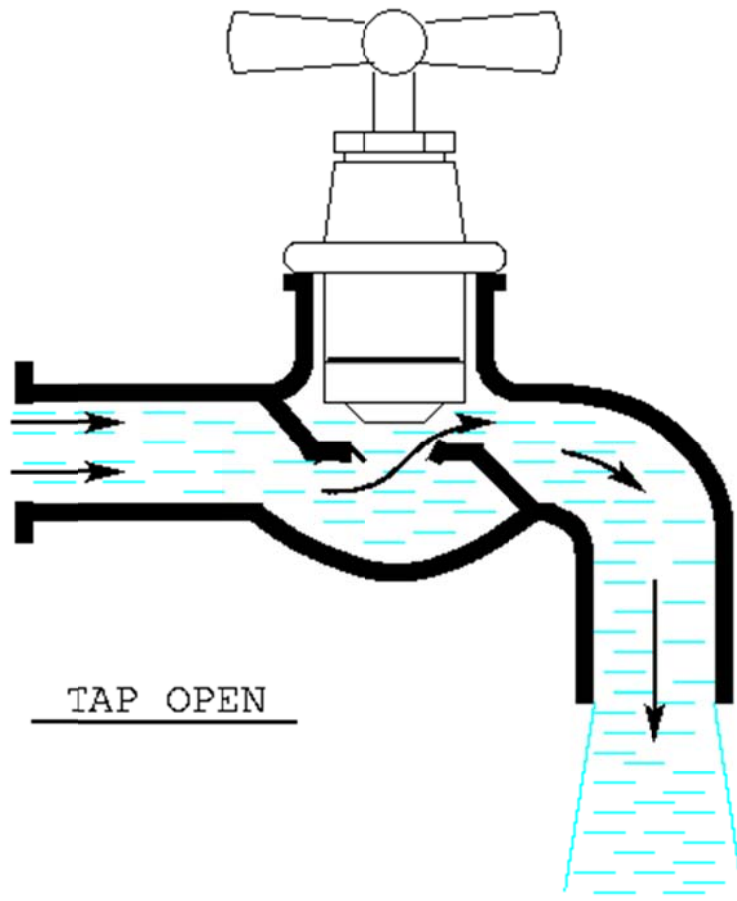
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How *The Tap* Assembly Works



To open *the tap* rotate the cap in the anticlockwise direction. Since the threads are right handed the spindle with the valve disc is screwed out of the main body. Clockwise rotation brings the valve disc into the contact with the seat and thus closes the tap.

Once the valve disc has left the seat uncovered water oozes out from the seat & thus water flows out as mentioned in the main body component

drawing.

When the valve disc covers the seat the water passage stops.