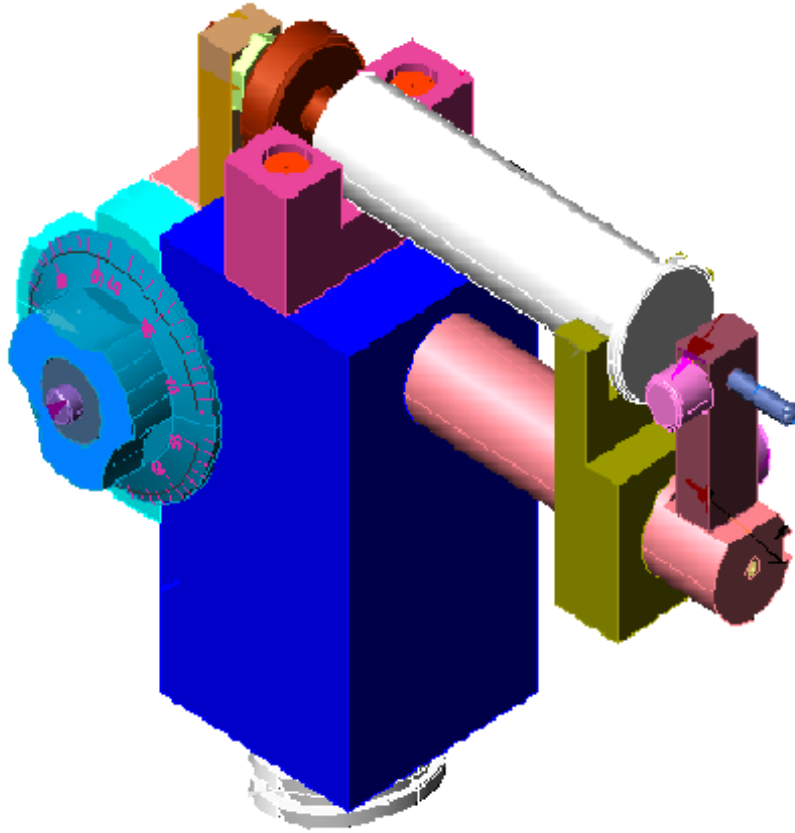


JOMINY FIXTURE FOR END QUENCH



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1. INDEX

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2. FORWARD

The most commonly used method for determining hardenability is the end quench test developed by Jominy and Boegehold. The details of the test are covered in ASTM A255.

In this test a normalized 25 mm diameter and 100 mm length test sample of steel (Ref.fig.1) to be evaluated is heated uniformly to its austenitizing temperature. The specimen is then removed from the furnace and placed in the end quench test Apparatus and immediately end quenched by a jet of room temp. water.

After end quenching, longitudinal Flat Surfaces are ground on opposite sides of the test piece as per dimensions given in (Fig.2). This grinding is very important for correct positioning of the sample in the fixture and also for accurate repeatable and reliable test results

3. GENERAL ARRANGEMENT AND INITIAL SET UP

(Ref. Assembly Drg. I & II)

The Adaptor (1) is to be positioned on the main screw of the hardness tester in such a way that the lock screw (2) passes in the key way of the main screw. Press the fixture on main screw top by hand and tighten the lock screw (2).

Rotate the hand wheel (11) in clockwise direction. This will rotate the pinion (8) and the slider shaft (5) moves to right side.

Stop the wheel rotation when the left end stopper (17) touches the face of central support(3).

This assures that the plane of end face of stopper (17) lies on the vertical axis of indenter and so if the test sample end is kept touching to this face it will be automatically at “0” position i.e. its end face lies on vertical axis of indenter.

At this stage confirm that the zero on wheel (11) matches with reference zero and the ball spring plunger (14) is inserted in one of the grooves on the wheel

If it is not matching and the difference is more than one division then (i) Loosen the Cap screw of wheel washer (13).

ii) Rotate the wheel (11) till the ball plunger is inserted and “0” is within 1 divn. (iii) Lock the wheel position by tightening the cap screw (13).

Now if the difference is less than 1 divn. Then adjust the reference line of zero suitably.

4. CONDUCTING THE TEST

- i Loosen the stopper clamp (25) and retract the right stopper (24).
- ii Position the test sample in such a way that –
 - a. Its quenched end face touches the end stopper (17).
 - b. Its ground flat at bottom side of the quenched end is resting on central support (3) and the flat at other end rests on side support (22).
- iii Slowly push the right stopper (24) Inside till it just touches the test sample. Do not press it on the sample or apply any clamping force on the sample which may lift the sample from its resting faces and give inaccurate test results.
- iv Tighten the stopper clamp (25).
- v Turn the wheel (11) in anticlockwise direction by 1 division. This will move the sample by 1 mm or by 1/16” according to the marking provided on the wheel .
- vi Check hardness value at this position.
- vii Turn the wheel and go to next position and so on.
- viii Tabulate the test results of hardness value at each step.

5. EVALUATION OF TEST RESULTS

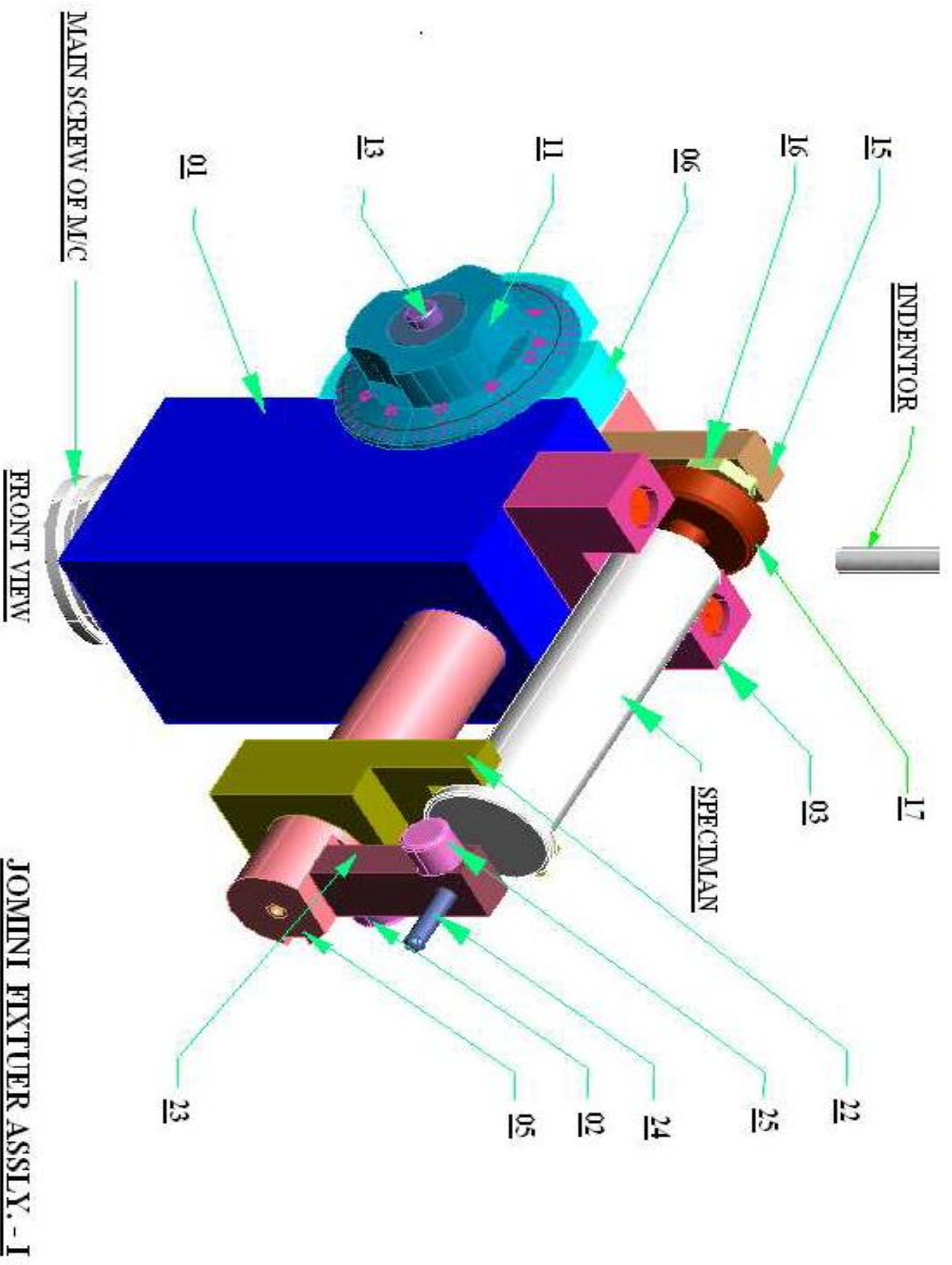
Plot the resulting data on graph paper with hardness value as ordinate (y axis) and distance from the quenched end as abscissa (x axis). Refer fig 3.

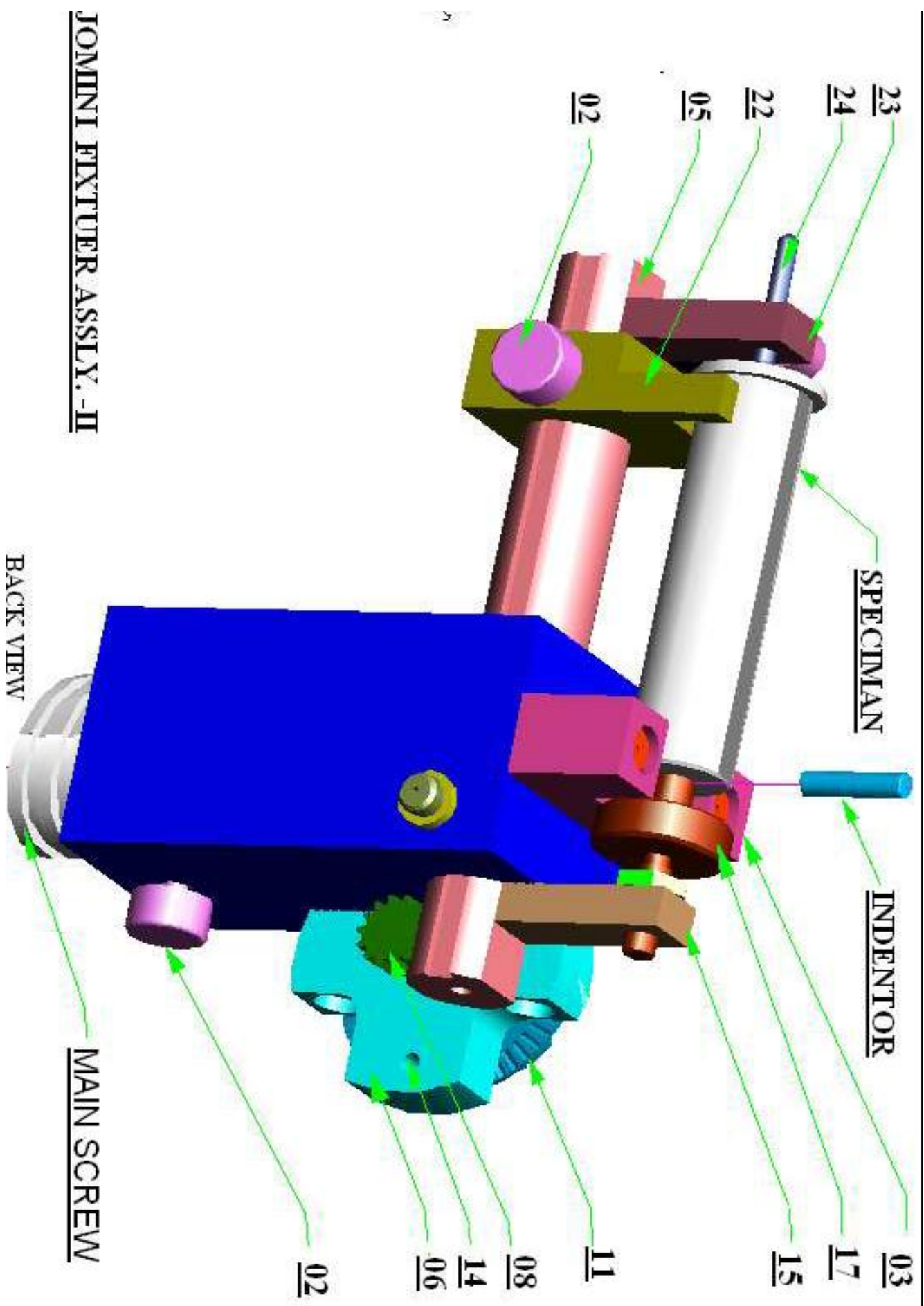
By comparing the curves resulting from end quench tests of different grades of steels, their relative hardenability can be established.

The steels of higher hardenability will be harder at a given distance from the quenched end of specimen than the steels of lower hardenability.

Thus the flatter the curve, the greater the hardenability. In this test, the hardness is normally not measured beyond 2” or 50 mm because hardness measurements beyond this distance is seldom of any significance. At about 50 mm from quenchal end, the effect of water on quenched end has deteriorated, and the effect of cooling from surrounding air has become significant.

Some highly alloyed steels known as air hardening steels will show a almost flat curve.





JOMINI FIXTURE ASSLY. -II

TEST SAMPLE FOR END QUENCH

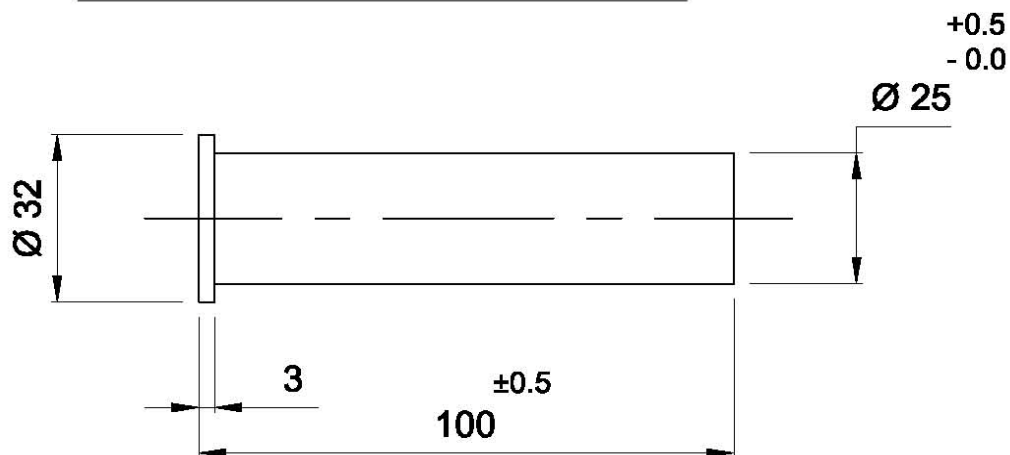


Fig. - 1

TEST SAMPLE FOR HARDENABILITY TEST

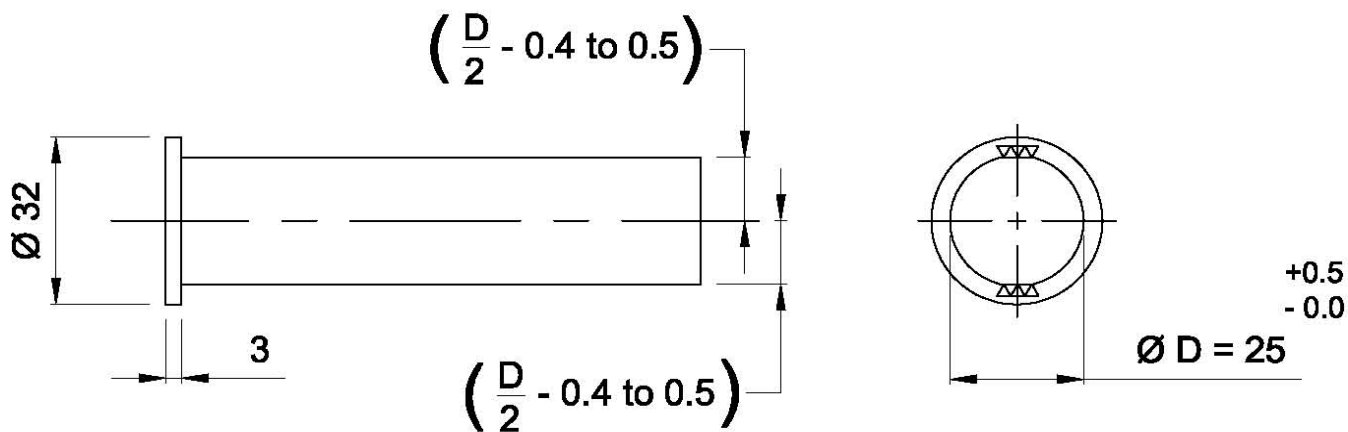


Fig. - 2

METHOD OF DEVELOPING END QUENCHED CURVE BY PLOTTING HARDNESS VERSUS DIST. FROM QUENCHED END - mm.

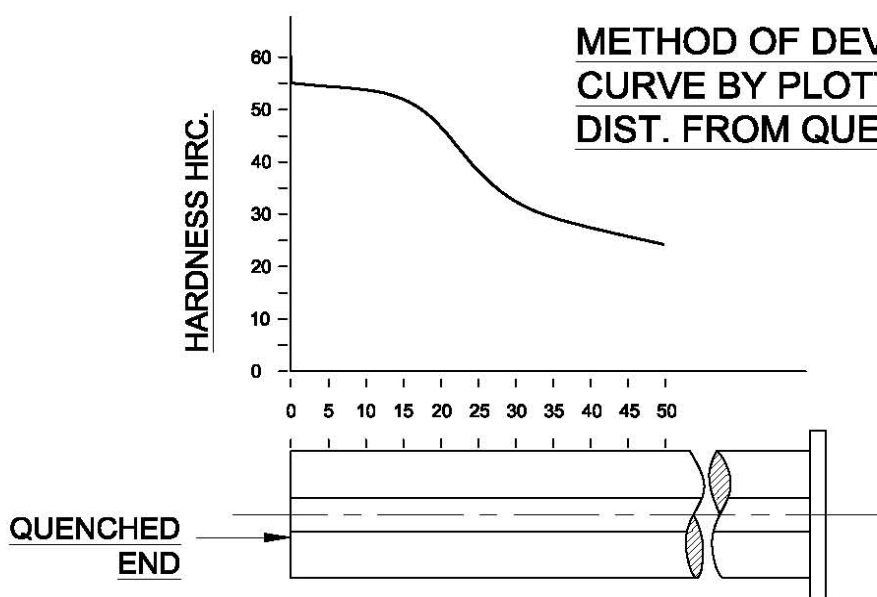


Fig. - 3