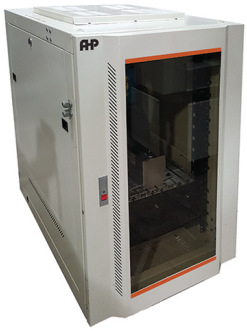
Sample Preparation for Tensile and Pendulum Impact Tests

Description

Tensile Test

Pendulum Impact



CNC Sample Milling

Notch Milling

Hot Press

Sample preparation for plastic sector depends on the material properties and shape of material is going to be tested. First question is that what do you want to test? if it is a raw material or it is finished product?

If you want to test raw material, be sure that you will be testing the final compounded material that is going to be entered to production process. Because unless there will not be homogeneity in the material and you will not have correct results. If you have final production compound in hand and want to do impact and tensile test you need to shape the material to get the sample piece. There are 2 main laboratory process for shaping raw plastic material:

1- Making sheet from raw material

2- Having injection molding machine and mold for sample piece

If you choose 2nd one, take care of different types of tensile sample pieces for plastic sector. You need to have different molds for different application as per standard in hand. You also need to have mold for different pendulum impact tests Izod, Charpy, tensile impact and so on. It is costly and time consuming if you don't have all molds in hand. For example Check below post to see some sample shapes of standards:

Using Laboratory CNC for Making Samples of ISO 6259 ASTMD 638 , EN 527-3 , ISO 179-1 , ISO 180 & ASTM D256 (Feasibility Study)

Making sheet is easy if you have material that the properties will not be so effected by cooling rate and

thickness of material. This is good choice. In this case even you can use very cheap manual hot press to make the granules as sheet for sample preparation.

Manual Hot Press

In manual hot press, just put the granule inside to plates that heated up to definite temperature and press them as sheet. It is manual press and vey easy to use. In this way you will have sheets of thickness 2 or 3 mm in hand for testing. After getting this sheet, if it is thermoplastic materials or elastomeric materials then you can put sheet inside manual cutting punch. We also have pneumatic type of such cutting punch machines.

Manual Cutting Punch

If there is need to control also the plate pressure for hot press and also to control the cooling rate, you need to have hydraulic hot press with hot plates that have circulation cooling water.

Hydraulic Hot Press

This simple press machine has simple cutting molds as per customer request. just put the sheet in it and press by manual hydraulic force. Then sample is ready in hand.

Another solution for expensive injection molding machines is our manual sample injection molding machine with simple aluminum molds. Always you need to care about cooling effect on polymer materials properties. If there is need to control cooling rate you need to have complicated laboratory injection molding machine with cooling rate control.

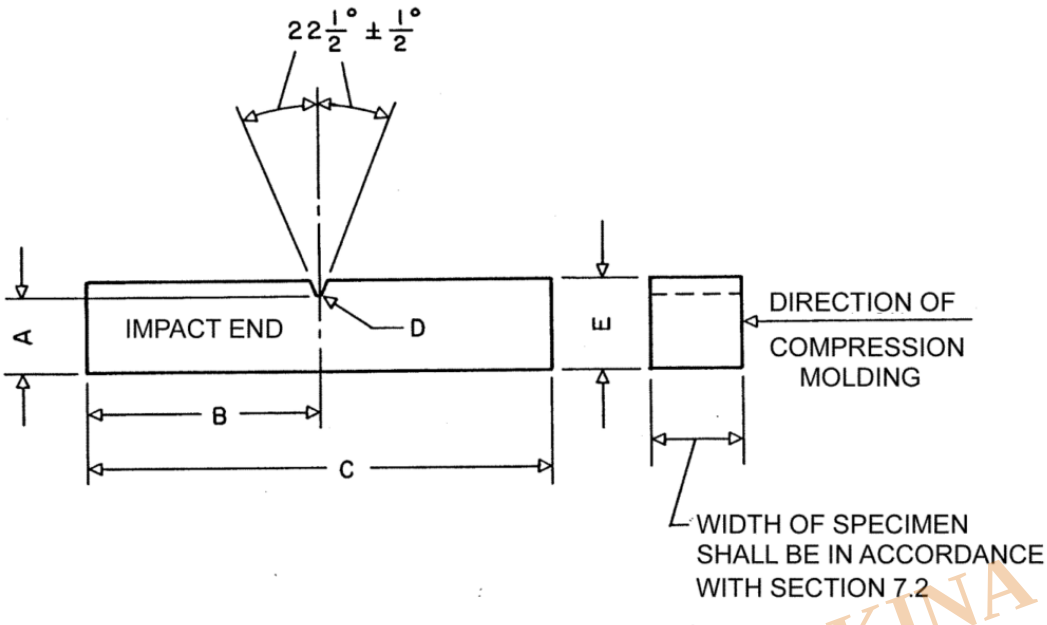
Manual Inejction Molding

If you have final products in hand like pipes, fittings, tanks, profiles, …. Then you have 2 options. If the material is soft and thickness is low (meaning such as less that 5 mm) you can easily make tensile samples using a manual hydraulic or pneumatic cutting punch and die as above. If the material is thermoset then even if the thickness is low, you need to take it to CNC milling machine.

Also if you have thermoplastic materials like HDPE, LDPE, LLDPE, … with high thickness, you also need to have CNC milling for sample preparation.

Another point is about the pendulum impact samples. If you have unnotched sample, you can easily make them by either complicated injection molding machine(with cooling rate and pressure control) and proper impact mold (Izod, Charpy, ..), or manual injection molding machine. But if it is notched

sample impact testing you will also need notch milling machine after injection molding.



	mm	in.
A	10.16 ± 0.05	0.400 ± 0.002
B	31.8 ± 1.0	1.25 ± 0.04
C	63.5 ± 2.0	2.50 ± 0.08
D	0.25R ± 0.05	0.010R ± 0.002
E	12.70 ± 0.20	0.500 ± 0.008

FIG. 6 Dimensions of Izod-Type Test Specimen

For example above drawing is for notched Izod sample. As you see there is notch in the middle of sample with controlled angle and end radius. These can not be controlled in the injection molding process to be completely conforming as standard. Then you need to injection mold the sample and put them inside notch milling machine as below:

Notch Milling Machine

Now you have brief information about what you need to have in your laboratory for sample preparation. For more deep information please don’t hesitate to contact our sales team.

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