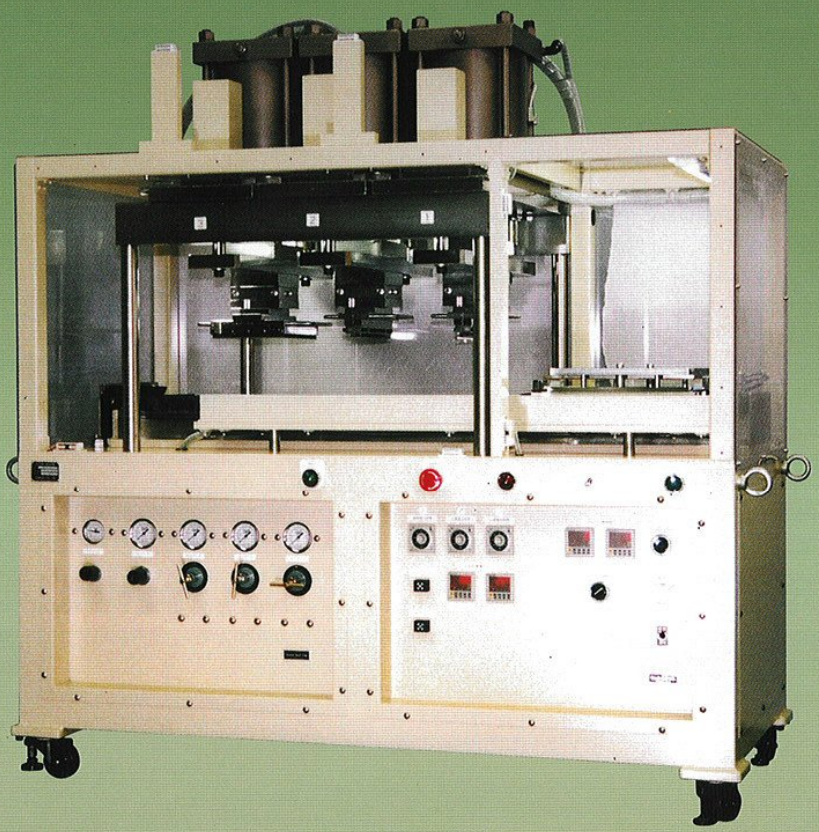
Super DumbBell

SD Type multi-purposes test piece room temperature cutting system(Compressed Air Type)
Conforms to ISO/New JIS, ISO-3167/JISK-7139,1B shaped

Plastic full automatic test piece cutting machine

(Compressed air type Super Separate Dumbbell Cutter automatic cutting machine)

Type:SDAP-1183-FBAT



Patent pending (Cutter is already patented in USA, Canada, Korea & Japan)

DUMBBELL CO.,LTD.

JIS-7139-1996 Standard (which is integrated by ISO Standard as new JIS in ISO International Standards (ISO-3167:1993) concerning plastic-thermoplastic materials) stipulates two kinds of standard specimen, types A & B. As the test piece for tensile test (Dumbbell shaped) and other multi-purposes test piece (prism shaped which is made by machining,etc. from a part of Dumbbell shaped test piece), it is told that types A & B have the features which expect not to occur too much unevenness in characteristic values obtained from the test piece formed for the purposes of wide use and under the same condition.

This equipment, SDAP-1183-FBAT,is improved by us as the latest model to obtain the multi-purposes test piece (1B/Dumbbell shaped) specially from 4 (t) mm sheet formed by the press. Type 1B for tensile test or other multi-purposes test piece (prism shaped) can be continuously and automatically cut by this equipment setting the numbers of specimen required in advance. Originally, it has been physically impossible to obtain directly the test piece for tensile test, Izod and Charpy impact test pieces and other prism shaped test piece by the cutting method from 4 (t) mm thick sheet of polyethylene HD/LD materials. Even if the such test pieces could be obtained, as they have many difficult points for the standard test pieces, generally machine-cutting-method, has been used as a realistic method. However, in the way of making by this method, there are many difficult points, e.g., much time to make is required, physical influence on the test pieces by friction heat caused at the time of cutting, roughness of machined surface, accuracy and the cost of the equipment itself, etc.

This equipment is developed by us as the rational and ideal full automatic cutting equipment for making the test pieces eliminating many such technical problems. Also, in improving this equipment, epoch-making ideas in the means of making the standard test pieces and the technique of Super Dumbbell Cutter Method (blades change method) which is our original products are combined.

Features of this equipment (Comparison between this equipment and machanical rotation cutting method) :

(1) Completely labor-saving by full automatic system :
Only setting of one press-sheet, cutting mode and numbers of specimen required, cutting work to the end of one cycle is fully done automatically.

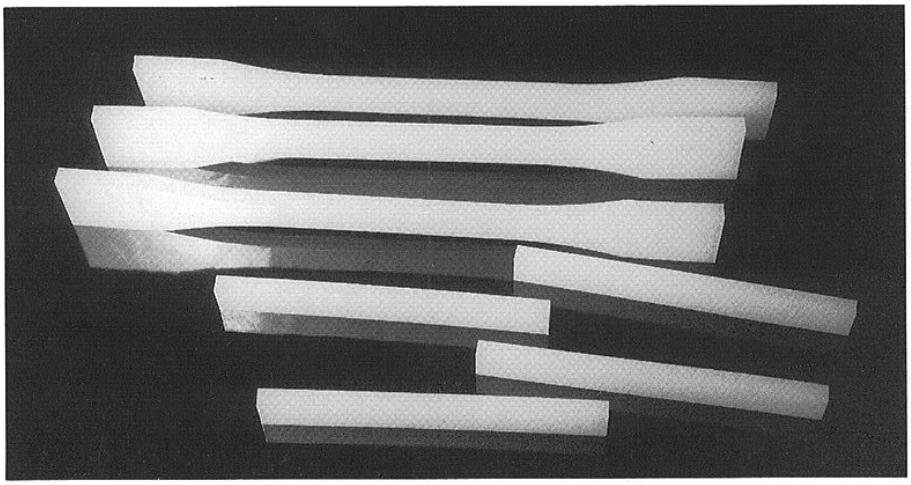
(2) Improvement of accuracy for a cut specimen (4(t) mm sheet, PE(HD/LD)) :
1. Accuracy of plane cutting (especially, parallel part to be measured) is within 10 +/- 0.07mm.
2. Cut surface (perpendicularity) : Standard deviation between upper and lower surfaces is 0.05 - 0.07mm.
3. Roughness of cut surface : Extremely excellent (see cut specimen).

(3) Influence on a cut specimen at the time of cutting :
1. As no frictional heat generates at the time of cutting, it does not influence on a specimen by the temperature and also does not generate a whitening phenomenon.
2. All cutting dies are designed and manufactured as blades-change-method configuration. Therefore, if the cutting edge of the blade is worn or damaged, you may change the blade only to new one. You can change the blade easily. Thus, you can always do the utmost functional control. Also, the mechanical part of this equipment can be used almost indefinitely.

(4) Obtainable various kinds and large quantity of specimen shortening the operation time :
1. According to the obtaining of the specimen required, this equipment can be applicable in many ways by changing the mode and interchanging the cutter unit.
2. In case of five specimen of 1B type Dumbbell shaped (from one press sheet), the time required for one cycle is approx. 50-60 seconds, meanwhile, the time required for one cycle for ten prism shaped specimen (10×80mm) is approx. 30 seconds.

(5) Safety of this equipment and clean environment :
1. Around the cutting room and the slide part of work-moving-table, the safety hoods made by the transparent resin and safety doors which provide safety operation are equipped.
2. This equipment is Super Dumbbell Separate Method which differs from rotation-cutter-cutting-method. So, this equipment can keep clean environment without causing any cutting filings and fine particles.

(6) This equipment is quite excellent in economically as the running cost of this equipment is extremely low.



Test pieces cut by this cutting machine

What is **SUPER DUMBBELL SEPARATE METHOD?**

This method is consisted of two cutter units having Super Dumbbell Cutters (blades change method) with one-flute (one sided) which is cut as the contours of curved line and straight line. The cutter units are completely separated with the contours of right and left comparison. As the cutting process, firstly, after cutting the face of one side, the work-moving-table moves correctly with the pitch established and then cut the face of the opposite side. After cutting the numbers of specimen established, furthermore, cut the end faces toward grip direction. Using the principle of 3-shot cutting method, at the time of cutting the press sheet, shearing stress receivable at the blade edge is reduced to approx. less then one half than that of the conventional method. Thus, this equipment became possible to change largely the physical limits of the conventional method. (The thickness of the blades to be used is t = 0.3).

What is **SUPER SINGLE STRAIGHT CUTTER METHOD?**

Incorporating one-flute blade (cutting edge) into the unit, cut a sheet correctly fixed by air-clamp on the work-moving -table with the cutter set as the contour of straight line transferring the appointed pitch and X axle parallel movement. After cutting the numbers of specimen established, the sheet moves to 2nd cutting area at where two end faces toward grip direction are cut simultaneously. After that, the cut specimen and the remaining wastes from the sheet are separated for the first time.

Double duty cutters by classification of multi-purposes test pieces and moving table mode

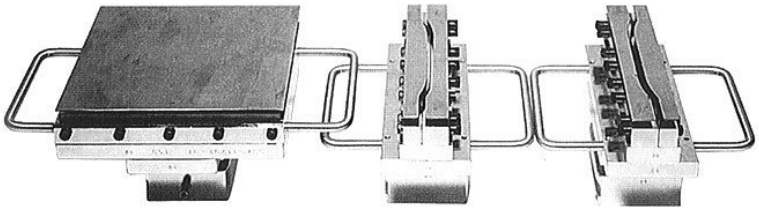
* Marked ○ Can be achieved with standard specifications.
* Marked △ Can be achieved with additional specifications.

Testing method	Quoted Standards	Type of test piece and dimensions	Combination Cutters	End surface Cutters		Mode
Tensile test	ISO527-2	Type A or B	SDSP Cutter	≧150×	○	○
Tensile creep test	ISO899	Type A or B	SDSP Cutter	≧150×	○	○
Bending test	ISO178	80×10×4	SSS Cutter	80×2P×	○	○
Bending creep test	ISO6602	80×10×4	SSS Cutter	80×2P×	○	○
Compression test	ISO604	(10~40)×10×4	SSS Cutter	40×	△	○
Impact intensity (Charpy)	ISO179	80×10×4	SSS Cutter	80×	○	○
Impact intensity (Izod)	ISO180	80×10×4	SSS Cutter		○	○
Impact intensity (Tensile impact)	ISO8256	80×10×4	SSS Cutter		○	○
Load deflection temperature	ISO75	(110 or 80)×10×4	SSS Cutter	110 or 80	○	○
Vicat softening temperature	ISO306	10×10×4	SSS Cutter		△	○
Hardness-Ball indentation	ISO2039-1	(≧20)×20×4	SSS Cutter		△	△
Environment stress cracking	ISO4599	Type A or B or 80×10×4	SSS Cutter	80×	○	○
	ISO4600		SSS Cutter	80×	○	○
Consistency	ISO1183 A method	30×10×4	SSS Cutter	30×	△	○
Oxygen index	ISO4589	80×10×4	SSS Cutter	80×	○	○
Comparative tracking index (CTI)	IEC112	>15×15×4	SSS Cutter		△	△
Electric corrosion	IEC426	30×10×4	SSS Cutter		△	○
Coefficient of linear expansion		>30×10×4	SSS Cutter		△	○

Type:SDSPK-1000-DU Series

Super Dumbbell Separate Cutter Unit

[JISK-7139 Type:1B, end face/side face (right & left) set]

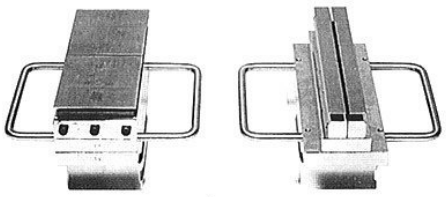


[Patented in USA, Canada, Korea & Japan]

Type:SSSK-1000-DU Series

Super Single Straight Cutter Unit

[For Prism shaped multi-purposes, straight line & end face set]



MAIN SPECIFICATIONS OF TYPE: SDAP-1183-FBAT

Type: SDAP-1183-FBAT	Air-drive 3-head type (Die set separate system)
Main cutting driving part	Dia. of air cylinder ram ϕ180×100(ST)mm stroke 3 parallel arrangement system
Air working pressure	1.5 - 7.5kg/cm^2(G) Solenoid valve 3 - position type, check valve retaining system
Sliding part of work-moving-table	Equipped 2-LM linear guides in parallel, thrust bearing bearing mechanism
Sliding stroke of work-moving-table	(Approx.) 700mm(Horizontally moving type)
Sizes of work-table	Effective max. sizes: 250×220mm and 200×200mm (with auxiliary attachment)
Work retaining mechanism	2 parallel (right & left) air-clamp system, Manual/Automatic Dia. of air cylinder ram: ϕ50×20(ST)mm 2 - position retaining type Work horizontally retaining air-vice air cylinder system:Dia. of ram ϕ25×10(ST)mm
Driving part and control system of work-moving-table	Direct coupled type of 5-phase pulse motor and ball screw, guide screw combining pulse driver & programming controller
Outer control panel	Programmable terminal (Liquid crystal panel type) 9"(Color)
Programming controller	Omron's CQM1 - CPU43V1 equivalent
Operation mode	Standard mode; Mode A : Tensile Dumbbell shaped Mode B : Prism shaped cutting pitch P=10mm
Obtaining numbers of spacimen	Standard mode; Mode A - 5 specimen / Mode B - 10 specimen ◎Additional mode / Mode C(additional mode) are according to special arrangement.
Cutters to be used	Standard accessories: (1) 1 set SDSPK-1001B-DU (right & left) & end cutter (2) 1 set SSSK-1000-DU & end cutter
Cutting room	Equipped PVC resin (transparent) safety hood structure and 2 safety doors.
Configuration of main body	Metal frame solid type with moving casters & adjustable bolts.
Illumination in cutting room	2×10W direct tube type fluorescent lamp
Power Source	AC-100v 50/60Hz Single phase 5A
Air supply pressure	6.5kg/cm^2 (G)
Unit dimensions	(Approx.) (W)1500×(D)600×(H)1400mm
Weight	(Approx.)450kg

HANDLING ITEMS

Manufacturing of various kinds of Physical Testing Machines,
Specimen Forming Molds for testing and Related Equipments
SD Type Sample Cutting Cutter and Related Equipments

DUMBBELL CO., LTD
79-25 Kasahata Kawagoe-shi, Saitama 350-1175 JAPAN
TEL.0492-32-1550 (Operator)
FAX.0492-33-5242