

Enhancement of Inspection Precision

High-precision inspection

The unique round-belt suction transfer mechanism firmly fixes the tablets on the belt while keeping them intact and the latest image processing technology enables detection of 50µm squares or larger black specks on the tablets.

Enhancement of inspection precision with optional dedicated cameras.

Optional cameras for the face and bottom may be added to enable recognition and inspection of embossing and scores. The precision of inspecting defective roughness (chips, blotches, peeled coating, etc.) on the face and bottom will be noticeably improved by using this ring illumination system.



Enhancement of Processing Capacity

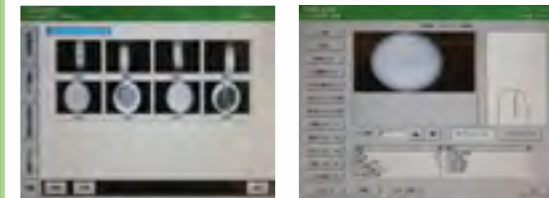
The suction belt system ensures stable transfer and soft handling of the tablets. A mechanism for improving alignment efficiency on the flow-control turntable has been developed to enable stable transfer of up to 350,000 tablets per hour (6 mm flat round tablet).

*May vary according to the shape and condition of tablets. A new function to confirm inspection time has also been added with a graphic screen to show processing capacity and defective ratio.

Enhancement in User Friendly · Analysis of Tablet Information

Analysis of tablet information

Confirmation of tablet information, image, waveform, data on the screen.



Monitoring function

Confirmation of the status of tablet transfer condition in each area.



Continuous operation

The inspection system is able to run continuously with the function to automatically solve a blockage caused by half-broken tablets.

Countermeasures for uncoated tablets (powder)

Continuous operability for uncoated tablets is also considerably improved by increasing powder collection ports on the flow-control turntable, adding powder recognition software, altering specifications for the rejection sensors and altering the shape of the powder collecting cleaner on the disc conveyor unit.

Guidance functionality for camera focus adjustment

A function to support the operator in obtaining optimum camera focus has been improved for better inspection precision.

Improvement in Changeover and Cleaning Efficiency

Shortened time for attaching and detaching parts

Tablet type changeover time has been shortened by decreasing the number of parts to replace, reducing the weight of parts, plus simplifying detachment and attachment procedures.

Weight of parts for respective units has also been reduced so that the physical strength of the operator does not affect his/her ability to change parts.

Confirmation of residual tablets

The inspection subsystem and rear side of the inspection subsystem are made simple and visible in structure, thus improving the cleaning efficiency of residual tablets.

Cleaning of parts in contact with tablets

Parts in contact with the tablets are easy to remove and washable.

Assured Quality

Assured quality of inspection systems because of VSP (Viswill Production System) activities.

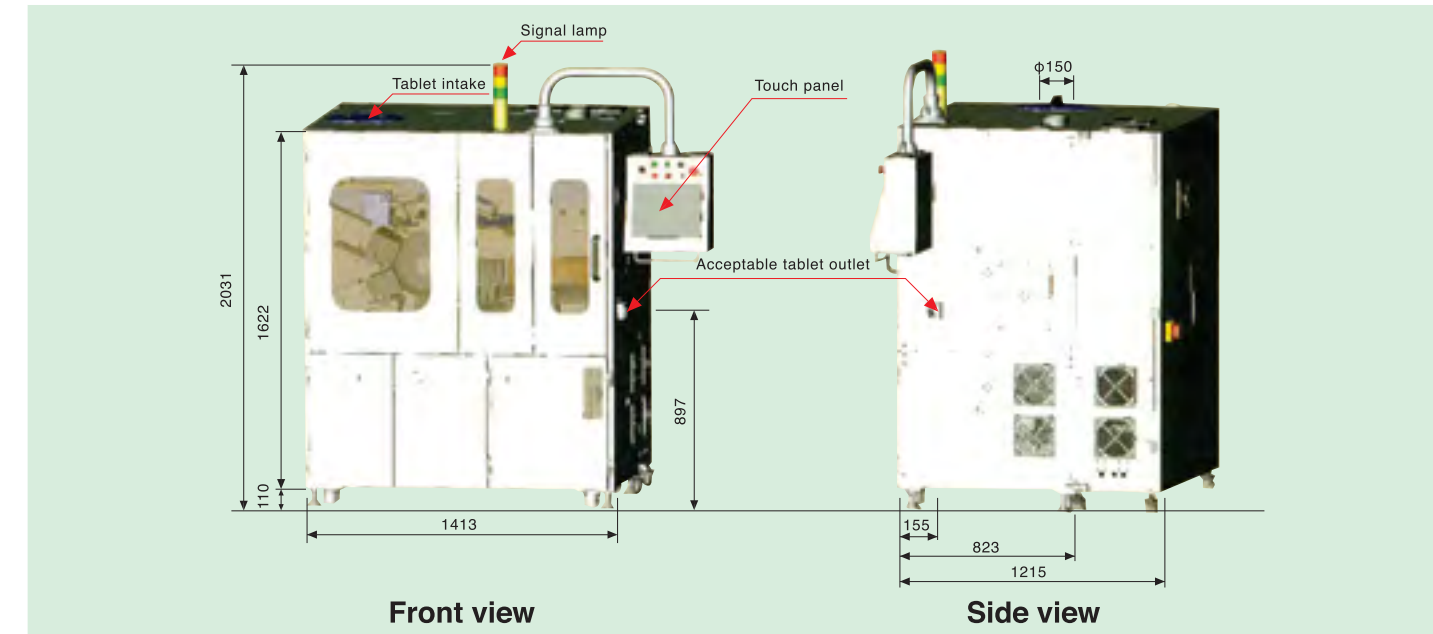
- Industry standard Validation Package
- Compliance of GAMP4
- Compliance of 21 CFR Part 11
- ISO9001/14001

TVIS-EX3 Standard Specifications

Item		Specifications	
Inspection functions	Applicable tablets	Uncoated, film-coated, sugar-coated tablets; tablets with printed mark on one or both sides; scored tablets; tablets with engraved mark.	
	Tablet size	Round tablets: 5-12 mm in diameter and 2-8 mm in thickness Shaped tablets: 5-12 mm in width, 2-8 mm in thickness, 5-21 mm in length Non-standard shape tablet is also applicable.	
	Inspected items	Dirt, scratch, adherence of foreign particle, crack, chip, deformation, different color, discoloration, scratchy print, blurred print, hair, mottled tablet, etc. (Algorithm to improve inspection accuracy has been added.)	
	Inspected surfaces	Face, back, and side	
	Inspection accuracy	Defects equivalent to a 50µm square or larger black speck	
	Processing capacity	350000 tablets/hour (actual value; dia. 6 mm). The value varies according to the size and shape of tablets.	
	Hardware	Inspection subsystem	Optical unit
Camera			CCD line sensor camera x 6*2
Monitor/communication			Industrial PC, Touch Panel(windowsXPe)
Data processing unit			Microcomputer, high-speed processor, signal processing analog board
Transfer subsystem		Hopper	Capacity:12 L
		Vibratory feeder	Transfer capacity: Max. 8000 tablets/min
		Flow-control turntable	dia. 600, 1 0.5, 0-60 rpm
		Conveyor units	Suction disc conveyor unit, suction belt conveyor units
		Rejection unit	Pneumatic system
Rejection subsystem		Defective tablet collection bin	Capacity:25 L
		Uninspected tablet collection bin	Capacity:8 L
		Pneumatic system	Suction blower for the disc conveyor and the belt conveyor units, 2.2 kW; suction blower for powder collection, 1.5 kW; cooling blower for the lamp units, 0.4 kW
Software	Inspection functions	Individual and overall evaluation; input of sensitivity; inspection condition setting; output of inspection results, networking	
	Diagnostic unit	Monitoring of inspection status, monitoring of hardware, self-diagnosis	
Size and environment	Dimensions	1413Wx1210Dx1720H	
	Weight	850kg	
	Power supply	200 VAC (3 phase), 50/60 Hz	
	Pneumatic pressure	≥ 0.35MPa	
	Ambient conditions	Temperature, 10-30°C; humidity 30-70%	
	Outer housing	Stainless steel	

*1, *2: Of the 4 units for face, 2 units are optional

TVIS-EX3



*Specifications and external appearance are subject to change without prior notice.
 *The data of this brochure is as of March, 2008

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Highly sophisticated inspection system TVIS-EX3

TABLET VISUAL INSPECTION SYSTEM



viswill
 DAICHI JITSUGYO VISWILL CO., LTD.

Outline of the System

The Tablets Visual Inspection System (TVIS-EX3) ensures appearance quality of tablets. Tablets are placed into the hopper positioned on the top left of the inspection system. Tablets supplied to the hopper are fed to the flow-control turntable by the vibratory feeder, lined up on the flow-control turntable, then transferred to the inspection subsystem. The sides of the tablets over a 360 degree range and the face and bottom of the tablets are inspected while they are transferred by the disc conveyor unit and the belt conveyor units respectively. While the tablets pass through the lighting units, images are taken by four high-precision CCD line sensor cameras from six different angles, checking for defects using state-of-the-art technical image processing and easy-to-set-up algorithms. Tablets judged defective during the image processing step are rejected by the double confirmation rejection unit. Upstream or downstream options, such as a tablet feeder or distributor, may be added to enable unattended operation for an extended period of time e.g. continuous overnight operation.

TVIS-EX3 System Layout



- | | | | |
|--------------------------|--------------------------|---------------------------|--------------------------------------|
| 1 Hopper | 6 1st belt conveyor unit | 11 Face 2 optical unit | 16 Defective tablet collecting bin |
| 2 Vibratory feeder | 7 2nd belt conveyor unit | 12 Face 3 optical unit | 17 Uninspected tablet collecting bin |
| 3 Flow-control turntable | 8 Side 1/2 optical unit | 13 Face 4 optical unit | 18 Acceptable tablet outlet |
| 4 Height & width gate | 9 Side 3/4 optical unit | 14 CCD line sensor camera | 19 Touch panel |
| 5 Disc conveyor unit | 10 Face 1 optical unit | 15 Rejection unit | 20 Operating panel |

Highly sophisticated inspection system TVIS-EX3

TVIS-EX3

TABLET VISUAL INSPECTION SYSTEM

■ New algorithm for chipping inspection

Inspecting chipped tablet edge

This specific algorithm can now securely detect chipped tablet edges without being affected by score lines or engraved marks.



■ Easy operation and improved analysis

On-line simulation

Parameters can be changed during inspection. Operators can check the inspection results in real time, which helps them set finely turned parameters.



Off-line simulation

Operators can change inspection parameters based on the prepared tablet images to easily adjust sensitivity of rejection criteria. Operators can then set the parameters as a new inspection condition before actually performing inspection. This function facilitates parameter setting for operators.



PC simulation [optional]

By importing tablet images to a personal computer, parameter settings and tablet data analysis can be conducted away from the inspection systems. Parameter settings on your personal computer do not need to stop the operation of the systems, thereby improving the efficiency of the production lines.

New algorithm for chipping inspection

New algorithm for printing inspection

High accuracy

Easy operation and improved analysis

Specific algorithm to detect fiber/hair

■ New algorithm for printing inspection

Inspecting printed marks

This specific algorithm dramatically improves the accuracy of detection of tablets with one/partial character missing or dirt near printed marks.



■ Specific algorithm to detect fiber/hair

Advanced algorithms to reject fiber/hair

By employing these new algorithms, extremely thin fiber/hair can be securely detected.

