

# NDT Materials and Solutions



We solve Non Destructive Testing Problems



# EISHIN KAGAKU



# Quality & Security

Eishin contributes to the 21-century society  
with the cutting-edge NDT technologies

Quality, the foundation of all industry fields. Non-Destructive testing technologies assure the quality, and support the industrial infrastructures.

As technology innovation has produced highly-advanced and complicated products, the needs of NDT have been getting higher for quality assurance purpose.

Eishin was found in 1957, and the company has been growing along with the development of Japanese industries and has been supporting the expansion of industries.

We now are recognized as an NDT specialist in a wide range of fields such as Nuclear power plants, steel, aviation, automobile, power generation, electronics, architecture, and food industries.

Eishin leads the NDT industry with its comprehensive ability to cover all technologies of Penetrant, Magnetic Particle, Ultrasonic and Eddy Current inspections, as well as to make full use of “Know-how” cultivated in abundant experiences over so many years.

Not only high quality and high accuracy, we also focus on the safety of the products, workability improvement and environmental protection. From the viewpoint of users, we are dedicated to developing the products that meet the needs of the age.

Eishin export advanced technology and products overseas, and our business stage is expanding worldwide.

Eishin promises to continue making the best effort to contribute to the realization of more affluent society through advanced NDT technologies as the most reliable brand.

Our Ibaraki factory has been certified according to ISO 9001:2015 to confirm the establishment of quality assurance system.

## Company History

1957 Eishin Kagaku Established

1961 Penetrant and Fluorescent approval MIL Standard and Ministry of defense Japan

1970 High Sensitivity Fluorescent Water Washable Penetrant approval Douglas USA and Boeing

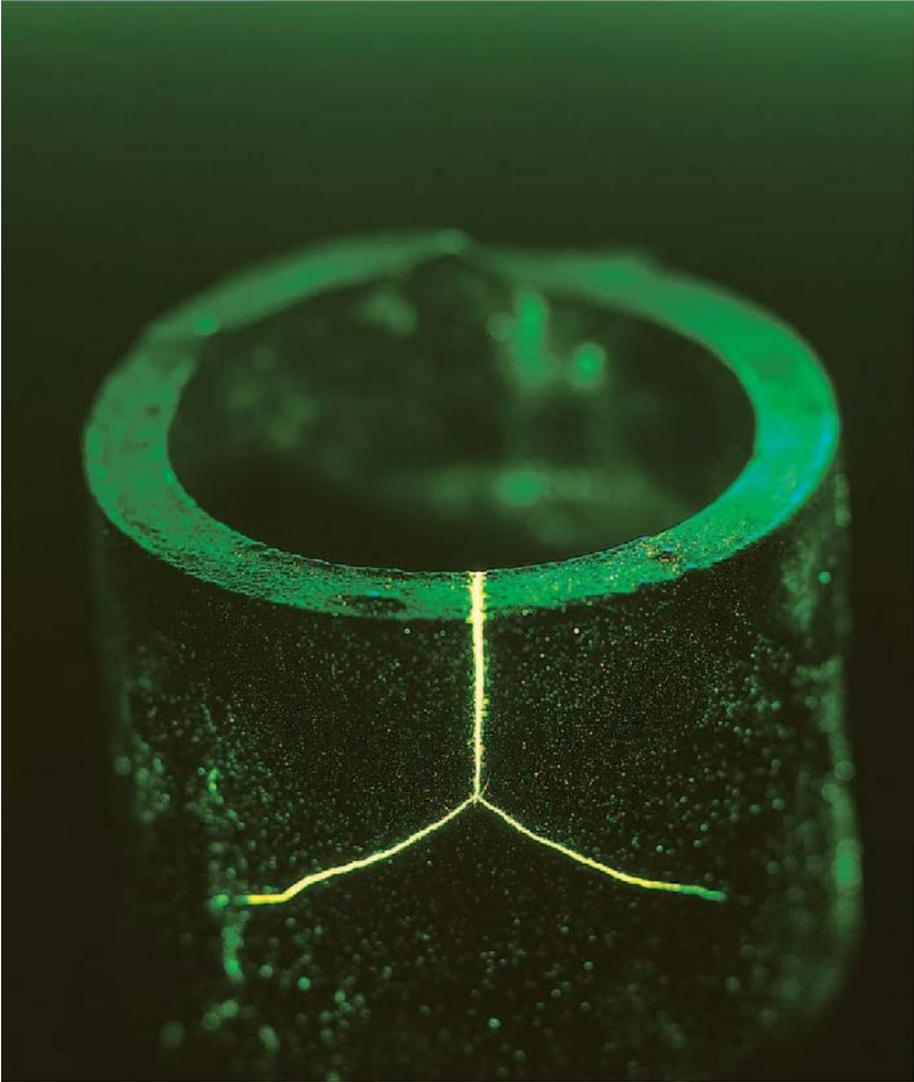
1973 High Sensitivity Fluorescent Water Washable Penetrant approval MIL Standard

1980 Fluorescent Penetrant approval GE and Rolls-Royce

1986 With MIL revision, got approval GE and Rolls Royce

1990 Fluorescent Penetrant approval P&W

2015 Approval ISO9001, ISO14000



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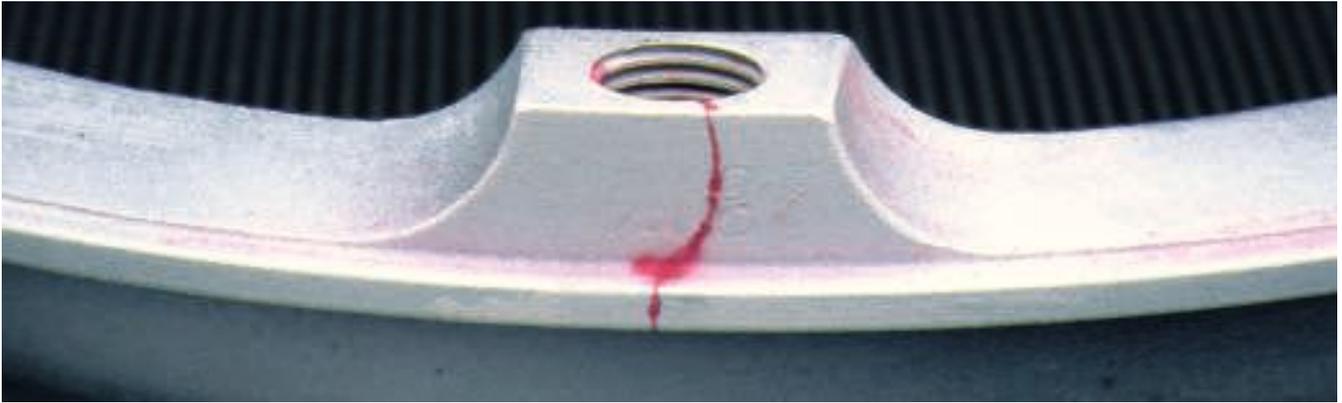
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# RED MARK



## ● SOLVENT REMOVABLE TYPE

<b>STANDARD Type</b>	Penetrant	R-1A(NT)
	Developer	R-1S(NT)
	Remover	R-1M(NT)
<b>AMS Qualified Type</b>	Penetrant	R-1A(NT)/1
	Developer	R-1S(NT)/1
	Remover	R-1M(NT)/1
<b>LOW HALOGEN /LOW SULPHUR Type</b> <small>Used for stainless steel, Ni, Ti alloys</small>	Penetrant	R-1A(NT)Special
	Developer	R-1S(NT)Special
	Remover	R-1M(NT)Special
<b>HIGH TEMPERATURE Type</b> <small>Used for High Temp (90-200°C) Note: Contained in 3.8 liter and 18-liter cans</small>	Penetrant	R-1AH(NT)
	Developer	R-1SH(NT)
	Remover	R-1MH(NT)

## ● WATER WASHABLE PENETRANT

<b>Standard Type</b>	R-3B(NT)PLUS	Casting, keyway, and screw thread
<b>LOW HALOGEN /LOW SULPHUR Type</b>	R-3B(NT)SpecialPLUS	Welding bead on stainless steel and Ti-alloys
<b>WATERBASE Type</b>	R-3B(NT)W-1PLUS	Raw materials, Slab Non-flammable

## ● SPECIAL DEVELOPER

<b>EASILY REMOVABLE Type</b>	R-1SB	Easy removal of developer coating after inspection
<b>FAST DRYING Type</b>	R-1SD(NT) R-1SD(NT)Special	Used at high humidity, low temperature Low halogen/Sulphur
<b>WET SUSPENDABLE Type</b>	R-3W	Developer particles suspend in water Non-flammable
<b>PASTE Type</b>	DP-1S	Applied with sprayer High viscosity, non-flammable

## ● SPECIAL REMOVER

<b>SLOW DRYING TYPE</b>	R-1MS(NT) R-1MS(NT)Special	Slow Volatilization Low halogen/Sulphur
<b>WATER SUSPENDABLE</b>	R-3MT(NT) R-3MT(NT)Special	Filled with purified water Low halogen/Sulphur

## ● WATER WASHABLE DYE PENETRANT

<b>WATER WASHABLE TYPE</b>	RB-300	Easy waste water treatment and recycling
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Safety, High-accuracy, Environmental protection, and we always pursue the “NEXT” in Visible dye penetrant inspection technique.

Visible dye penetrant inspection materials indicate defects open to the surfaces of all kinds of materials in “RED”.

Visible dye penetrant testing is the technique to detect the surface defects and through cracks easily using penetrant, developer and remover. Applying these three materials indicates clear and accurate patterns of the defects in “RED” against the “WHITE” background.

Various types of RED MARK are in our product lines, and you can choose the best one for your application.



### Container

Aerosol type:	450cc
Cantype:	3.8L, 18L
Drum:	200L

# NEO GLO



**Ideal for detecting fine defects.**  
**Fluorescent patterns of defects are more perceptible to naked eye.**

NEO GLO series have been qualified by U.S. Air Force, Japan Self- Defense Force, Aircraft manufacturers in U.S. and U.K., etc. as highly reliable inspection materials. The Scope of NEO GLO has been expanded to inspections for auto parts, new materials, semiconductors, and rocket parts.

**•FLUORESCENT WATER WASHABLE PENETRANTS**

SENSITIVITY	NAME	PRTR	AMS
LOW	F-4A /1		○
	F-4A-Au PLUS	○	
	F-4A-WE PLUS	○	
MEDIUM	F-4A-B PLUS(T)	○	
	F-4A-B/1		○
HIGH	F-4A-C PLUS(N)	○	
	F-4A-C/1		○
ULTRA HIGH	F-4A-E PLUS	○	
	F-4A-E/2		○

**•POST-EMULSIFIABLE FLUORESCENT PENETRANTS**

SENSITIVITY	NAME	PRTR	AMS
LOW	F-5L/1		○
MEDIUM	F-5L-SP/1	○	○
HIGH	F-6A/1		○
ULTRA HIGH	F-6A-SP/1	○	○

**•WATER WASHABLE FLUORESCENT PENETRANTS**

Easy wastewater treatment and recycling

SENSITIVITY	NAME	PRTR	AMS
LOW	FB-3100C	○	
MEDIUM	FB-3500A	○	
HIGH	FB-3600M		

**•Emulsifiers**

Type	NAME	PRTR	AMS
Oil Base	F-5E-SP/1		○
Water Base	F-6E-W/1		○

**•Developers**

Type	NAME	PRTR	AMS
Dry Type	F-5D/1	○	○
Wet Type	F-4W-SP/1		○
Fast Dry Type	F-4S(NT)	○	
Fast Dry Type	F-4S(NT)/1	○	○

**•Removers**

Type	NAME	PRTR	AMS
Standard	R-1M(NT), R-1M(NT)/1	○	○



**Container**

Penetrants, Emulsifiers, Fast-drying Developers, Removers.....3.8, 18 liter can  
 Dry Developers .....1, 2 kg in corrugated carton  
 Water Suspensible Developer...1 kg, 6 kg can

# NEOGLO-UNITS

## More efficient and economical inspection systems

Fluorescent penetrant inspection systems, with that a large amount of test objects can be inspected efficiently and economically, have been widely used for precise inspections of various types of parts including those in the aviation industry. NEOGLO-UNITS have been designed and made to satisfy users' needs adequately by making full use of "know-how" cultivated in long-term experiences and abundant sales achievements.

Eishin's penetrant inspection systems are mainly divided into four types. Test objects are transferred manually by hand or with hoists. Automatic system is also available. Every inspection process can be automated from penetration to inspection, and the test objects are transferred automatically.

### ●EF-A type system

Small-sized penetrant testing system (about 5m in total length) for small and light weight test objects. Basically, test objects are manually transferred between the stations.

### ●EF-B type system

Medium-sized penetrant testing system (about 10m in total length) for large and heavy weight test objects. Usually, test objects are transferred on the roller conveyer between the stations. Each station is equipped with a lifter or a door.

### ●EF-C type system

Large-sized penetrant testing system (more than 10m in total length) for mass-produced parts. The test objects are automatically transferred on the independently-driving roller or chain conveyer.

### ●EF-D type system

EF-D type system is equipped with the waste water treatment system dedicated to separate-type water washable fluorescent penetrants. Rinse water can be recycled with this system.

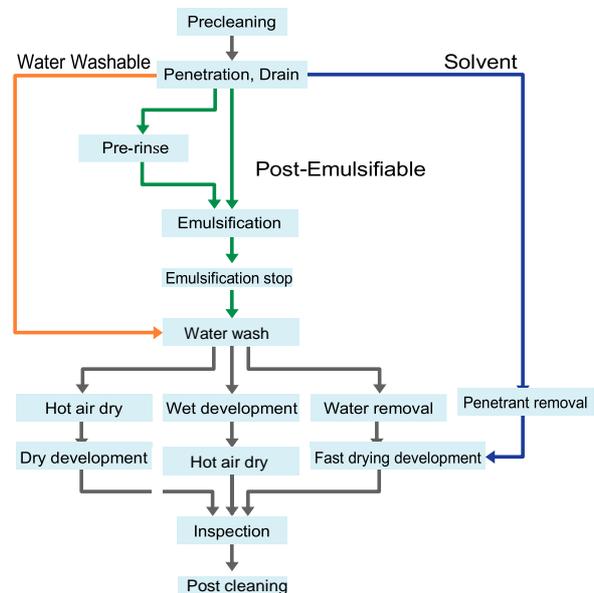
\* Waste water treatment systems for standard penetrants (MIZUSUMASHI) are also available.

\* Custom-designed system is available.



## Procedures for fluorescent penetrant inspection

Fluorescent penetrant inspections may be performed in three methods. Select any of these methods and the type of the penetrant to be used depending on the material type of test objects, the surface condition and the defect type.



# MAGNATRON

MAGNATRON is high-sensitive magnetic particle and it gives a clear contrast between defects and the background.

## Fluorescent magnetic particles

Fluorescent magnetic particles show brilliant fluorescent under black light. Even a lower concentration of suspension than 1g/liter achieves high sensitivity.

NAME	PARTICLE SIZE ( μm )	Concentration Range(g/L)	SETTING PARTICLES (ml)
SY-6000	5 ~ 30	0.5 ~ 2.0	0.04 ~ 0.12
SY-7000	5 ~ 20	0.3 ~ 2.0	0.02 ~ 0.12
SY-7000S	1 ~ 15	0.3 ~ 2.0	0.04 ~ 0.21
SY-7500	2 ~ 5	0.3 ~ 2.0	0.03 ~ 0.20
SY-8000	Less than 3	0.1 ~ 2.0	0.02 ~ 0.40

## ●HIGH LUMINANCE Fluorescent Magnetic Particle

NAME	PARTICLE SIZE ( μm )	Concentration Range(g/L)	SETTING PARTICLES (ml)
SY-6000Br	1 ~ 15	0.3 ~ 2.0	0.03 ~ 0.20
SY-6300	1 ~ 10	0.1 ~ 2.0	0.02 ~ 0.25
SY-8500	1 ~ 7	0.1 ~ 2.0	0.02 ~ 0.32

## ●Aerosol Fluorescent Magnetic Particle

Ready-to-use suspension is contained in aerosol cans. Correct amount of fluorescent magnetic particle is suspended in oil.

NAME	PARTICLE SIZE ( μm )	Concentration Range(g/L)
SY-7500	2 ~ 5	2.0g/L
SY-7500 Special	2 ~ 5	2.0g/L
SY-8000	Less than 3	2.0g/L
SY-8000XB	Less than 3	2.0g/L
SY-8000W	Less than 3	2.0g/L

## ●Premixed Fluorescent Magnetic Particle

Premixed fluorescent magnetic particles with conditioning powder. The solution can be easily prepared by simply putting a predefined amount of particles into water and stirring. Two types, SY-7500WS-3and SY-7000SP are provided.

NAME	PARTICLE SIZE ( μm )	Concentration Range(g/L)	SETTING PARTICLES (ml)
SY-7500WS-3	2 ~ 5	0.5-2.0	0.25(2.0g/L)

## ●Concentration Fluorescent Magnetic Particle

It can be prepared simply by pouring this solution into water. This product (500 ml per bottle) can prepare 100 liters of 1 g / L magnetic powder solution.

NAME	PARTICLE SIZE ( μm )	Concentration Range(g/L)	SETTING PARTICLES (ml)
SY-25WD	4 ~ 21	0.5 (400times dilution)- 2.0 (100times dilution)	0.10(1.0g/L)
SY-35WD	4 ~ 19		0.12(1.0g/LH)
SY-45WD	3 ~ 15		0.12(1.0g/LH)
SY-75WD	2 ~ 5		0.13(1.0g/LH)



## Non-fluorescent magnetic particles

### ●Wet type

Wet type magnetic particle is used for observing under white light. Select the best type for your application and test conditions by color contrast against the surface of the test objects.

COLOR	NAME	COLOR TONE	PARTICLE SIZE ( μm )	Concentration Range(g/L)	SETTING PARTICLES (ml)
Red	MA-30	Reddish Brown	5 ~ 30	10 ~ 20	0.55 ~ 1.10
Black	MK-10	Black	Less than 3	2 ~ 10	0.95 ~ 5.00
	MK-15	Black	2 ~ 5	2 ~ 10	0.15 ~ 1.40
White	MS-30	Off-White	5 ~ 30	10 ~ 20	0.70 ~ 1.40

### ●Dry type

Dry type is used by spraying with air on the surfaces of the test objects. Apply this type to the dry surface.

COLOR	NAME	COLOR	PARTICLE SIZE ( μm )
Red	MA-100	Reddish	5 ~ 50
	MA-200	Reddish	5 ~ 30
	MA-100B	Reddish	40 ~ 100
Black	MK-300	Black	30 ~ 50
White	MS-200	Off-White	5 ~ 50
	MS-300	Off-White	5 ~ 40
	MS-400	Off-White	5 ~ 30
	MS-300M	Off-White	40 ~ 100

Remarks: High-temperature white magnetic particle MS-200H. applicable for up to 500°C tested objects.

### ●Transfer premixed type (Aerosol)

Black magnetic particles, MK-10, is suspended in a fast-drying solvent. Ideal for transferring and recording the defects.



### ●Container

Magnetic particles: 1kg, 5kg can  
Conditioners, Rust preventives: 3.8-liter, 18 liter can  
MAGNATRON OIL: 18 liter can

## BLENDEx(Disperser)

To disperse magnetic particles in water, any disperser should be added. Make a paste with disperser (BLENDEx) and magnetic particles before disperse in water.

TYPE	COLOR	USAGE	FEATURES
Blendex-B	Light Milky White	0.5 ~ 2.0% to water	Regular type, Well suspended
Blendex-D	Viscous Liquid		Non-forming, use when bubbling during circulation of magnetic particles solutions
Blendex-RH	Viscous Liquid	3 ~ 5% to water	Strong rust-prevention. Can paint directly on the parts without cleaning after inspection

## MAGNATRON OIL (Dispersed oil)

Use this oil product instead of kerosene to disperse magnetic powder in oil. Since the flash point is 94 ° C or higher, there is no danger of fire at LOW temperature compared to kerosene and it is odorless.

## RESMINE (Rust preventive)

By adding Remine to the magnetic particle water solution prevents rusting after inspection. (Adjust the amount depending on your requirement.)

**RESMINE.....**For general steel materials. Add 1-5% to magnetic particle suspension.

**RESMINE C.....**For casting materials. Add 0.5-5% to magnetic particle suspension.

# HANDY MAGNA



A-1



A-2



A-4



A-6



TE-2

The best-selling portable yoke electromagnet HANDY MAGNA has a dominant market share for its excellent detection ability and abundant variety of types. Contact magnetic poles directly with test objects and apply magnetic particles, hold down the switch and magnetic particles indications will appear where the defects are. Best for welded area.

●Type

A-1	Standard type. Mainly used for welding, universal yoke
A-2	Small and light-weight type of A-1 convenient for long time inspections. Universal yoke is optional
A-4	Flexible yoke. Multi-purposes and wide applications
A-6	Small and light-weight type of A-4
TE-2	Ideal for local and small area, Good portability inspections

●Configuration

- Body (with a micro switch)
- 5 Meter power cord (3-core, two-type rubber cap tire cable)
- Steel carrying case

●Features

- AC continuous method achieves higher ability to detect surface defects by the skin effect.
- Yoke method suppresses an electric current flowing directly into the test objects, and avoids the possibility of sparking.
- Small, light, AC 200V or 220V (other voltage option) portable size.
- Any test objects can be inspected with HANDY MAGNA yokes.
- Waterproof switches minimize the risks of layer short or electric shock to human bodies in wet method.
- Type A-1, A-2 and A-6 are with potted cable. Tough and waterproof.

●SPECIFICATIONS

	A-1	A-2	A-4	A-6	TE-2
Rated current (A) 50 Hz	4.0	2.5	4.0	3.5	1.2
Rated current (A) 60 Hz	3.0	2.3	3.0	2.3	0.7
Total magnetic flux (mWb) 50 Hz	0.80	0.60	0.70	0.57	0.30
Total magnetic flux (mWb) 60 Hz	0.70	0.55	0.57	0.48	0.27
Leg Span (mm)	140	110	140	110	70
Magnetic pole section size (mm)	25X25	20X20	25X25	20X20	15X15
Weight without cable (kg)	3.2	2.0	3.6	2.0	1.2

●Duty cycle

- A-1, A-2 and A-6 .....70% (5-sec on, 2-sec off)
- TE-2 .....50% (5-sec on, 5-sec off)
- Lifting power (excluding TE-2) .....Above 10 pounds
- A-1 and A-6 are designed for 50 Hz • 60Hz

# UV-LED Black Lights

Eishin UV-LED Black Light is specialized in performance necessary for non-destructive inspection. In addition to power saving and long life, portability is improved and heat generation is suppressed, convenience is improved, compared with conventional products. Each black light has measures to cut harmful visible light at the time of observation, and it can be used even in a demanding aircraft industry.

## Hand-Held type

### S-35LC/S-35LCE

The S-35 LCE also improves the S-35 LC to conform to ASTM E 3022 and RRES 90061 and can be used for demanding aircraft inspections. Standard equipped "V-Cut Glass" cuts unnecessary visible light on inspection.



S-35LC/S-35LCE

## Flashlight type

### ZB-365J

Portable high-power flashlight come with 2 rechargeable batteries. Provides approx. 3hours of continuous inspection. Choice of range and ultraviolet light intensity by the Dimming function. Standard equipped with "synthetic quartz glass filter " cuts unnecessary visible light on inspection.



ZB-365J

## Stationary type

### L-500LC/L-500LCE

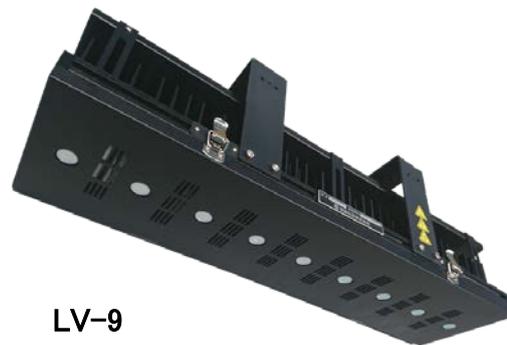
High power overhead stationary UV led with low running cost. Multiple units can be connected and used. The L-500 LCE conform to ASTM E 3022 and RRES 90061. With output adjustment function (option). Standard equipped "V-Cut Glass" cuts unnecessary visible light on inspection.



L-500LC/L-500LCE

### LV-6/LV-9/LV-18/LV-24

The patented even light distribution technology, and there is no reduction in UV illumination among the lamps even during continuous lighting. In spite of being fan less, it has the high heat dissipation performance that is essential for LED lights, and eliminates the causes of failure and short LED life at a high level.



LV-9

## ■ Specifications

Mode	S-35LC/ S-35LCE	ZB-365J	L-500LC, L-500LCE	LV-9
Power consumption	23W	-	40W (Max)	180W
Size (mm)	300×185×204 Φ92×169×237(mm)	Φ38(Head) φ25(Grip)×147(mm)	220×220×160(mm)	119×304×202(power supply) 630×171×188
Weight (Kg)	3.4kg, 0.6kg	0.18kg	6kg	6.0kg (power supply) 8.2kg
UV-A Intensity (μw/cm <sup>2</sup> )	LC:4,500(15" /381mm) LCE:3,000(15"/381mm)	Up to19,990 (15" /381mm)	LC:4,200(60cm) LCE:4,000(15" /381mm)	6,500(24"/60cm)
Power In	AC100V±10% (50/60Hz)0.3A	Li-ion Battery	AC100V±10% (50/60Hz )0.4A	AC90~264V (50Hz/60Hz)1.7A
Power Supply Cord Length	2.5m(Lamp), 3m (Power supply)	None	3m	5m(Lamp), 3m (Power supply)

Eishin Test Panels are ideal penetrant sensitivity comparators. Having matched pairs enables studies of the effects of process changes as compared to a standard process, or used material changes vs fresh material. Test panels allow "in use penetrants to be compared against "new, unused" product to determine if the penetrant is performing properly.

## Category

### Type 1: ISO 3452-3 JIS Z 2343-3

Twin Type: 2 mm thickness

Crack depth: 10, 20, 30, and 50  $\mu\text{m}$

Material: Brass with Ni-Cr coating

### Type 2: ISO 3452-3 JIS Z 2343-3

Having two functions, crack and roughness

Material: Stainless with Ni-Cr coating

### Type 3: AMS 2644 JIS Z 2343-3

24S aluminum quenching crack test panel

Material: Aluminum

### ASME Type: ASME Sec. 5 Art. 6

Twin Type: 10 mm thickness

Material: Aluminum

### •Sensitivity Level Type 1

Crack Depth	Level
50 $\mu\text{m}$	1, 2, 3, 4
30 $\mu\text{m}$	2, 3, 4
20 $\mu\text{m}$	3, 4
10 $\mu\text{m}$	4

### Type 3

Crack Depth	Level
Approx.	1

## How to use Test Panels

- 1) Test Panels are used for penetrant-effectiveness testing and judgment of testing process.
- 2) ASME Type is used in principle as a pair of test panels separated to two portions by the slit (center line). And the test panel also can be used by cutting-off to two panels.
- 3) Regarding to the penetrant-effectiveness testing, two kinds of penetrant materials to be compared shall be respectively applied to the pair of test panels separated by the center slit. And tested under the same condition for the comparison of the effectiveness.
- 4) For the judgment of testing process, the same penetrant material shall be applied to the two test panels, and tested respectively by the different process for the comparison of the testing process.
- 5) One test panel should be used in common for testing of dye penetrant suspension and testing of fluorescent penetrant suspension.

Type 1



Type 2



Type 3



ASME Type



## Hoffmann TAM Panel

Pratt & Whitney approved Hoffmann brand TAM panel consisting of a 2.5mm thick stainless-steel plate with half the test surface hard coated with a micro thin chrome alloy. The chrome colored half contains five controlled and evenly spaced cracked centers. The cracked centers in a circular pattern forming 5 star-like shapes.



## Low-halogen and Low-sulfur type Marking pens

- Special marking pen for nuclear power equipment and related parts.
- Content of halogen elements are minute amount. (Less than 100ppm Chlorine, Less than 50ppm Fluorine and Sulfur)

### •Colors and Tips

	Standard - 3mm tip	Small - 1mm tip	Fine - 0.5mm
Black	○	○	○
Red	○	○	○
White	○		
Blue	○		



## •Foaming gas leakage detector GL-1B/GL-1B Special

Apply GL- 1B/GL- 1B Special, and even a minute amount of gas leakage can be instantly seen as bubbles. Widely used for gas leakage detecting for various type of tanks and piping systems. GL-1B Special is applicable for austenite stainless steels, titanium alloys and nickel alloys.



## •Industrial Degreaser ACE Cleaner

- Degrease and cleaning of metal products, ceramic and plastic products
- Erase Marking pen ink and marking-off Clean off rust-preventive agent, etc.

- Container  
550 type aerosols can (degreaser contained:400ml)  
3.8-liter, 18 liter can





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