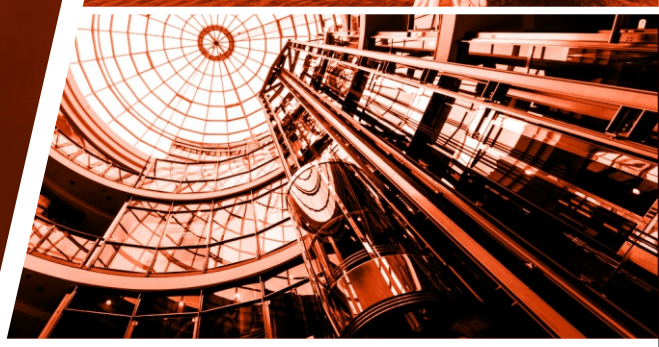
TST FDSYS.P™
FOR
PORTABLE WIRE ROPE INSPECTION



TST FLAW DETECTION TECHNOLOGY CO.,LTD.

INTRODUCTION

System Description

TST FDSys.P Flaw Detection System is developed on basis of magnetic inductive sensing technology and MFL(magnetic flux leakage) wire rope inspection technique. The system can be applied for the portable inspection of steel wire ropes and steel pipes for the physical damages or material deteriorations.

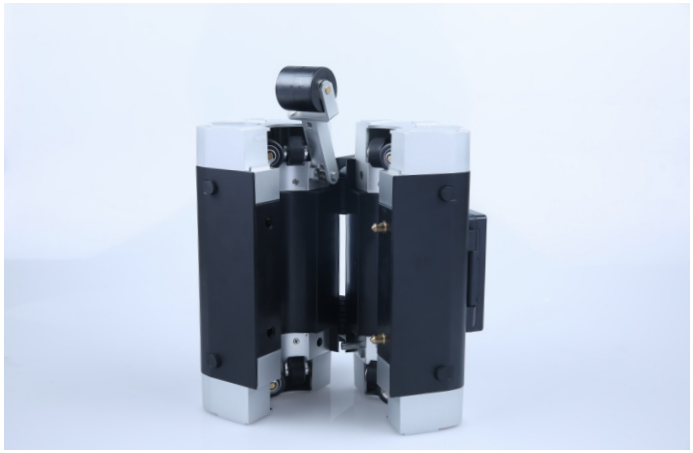
TS-X1124\X1142\X1160(X) are the 3 standard models in the portable series for the inspection of steel wire ropes with diameters of 6mm-70mm.

Customized models can be developed based on specific applications of the clients, such as for extra wide wire ropes up to 120mm, and for enviroments that require Intrinsic Safe and Explosion Proof design.

Customized Model for Instrinsic Safe and Explosion Proof

Customized Model for Extra Wide Wire Rope

SYSTEM FEATURES



General

- Nondestructive inspection of wire rope with diameter from 6-70mm
- Detection powered by TST sensor array
- Portable detection of various flaw types including broken wire, corrosion, pitting, abrasion, fatigue etc. for which a magnetic signature will be left due to the occurrence of a flaw event.
- Instant monitoring and evaluation of inspection process with portable 'Control Panel' and 'Screen'
- Data processing with built-in signal processor for portable application
- Evaluating and reporting with built-in and PC software set for portable application

Inspection Speed

- < 15 m/s (or as limited for safe operation)

Defect Types

- LF(Local Fault) LMA(Loss of Metallic Area)
- Physical Damages: Broken wire, Abrasion,Structure Deformation
- Material Deteriorations: Corrosion, Fatigue

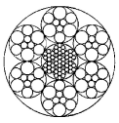
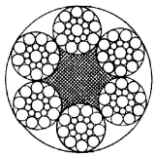
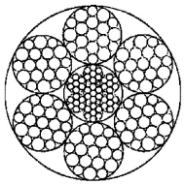
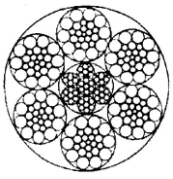
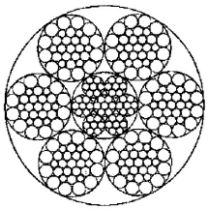
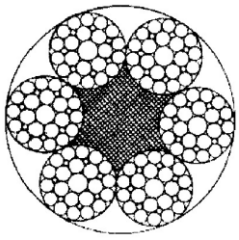
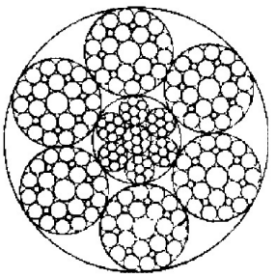
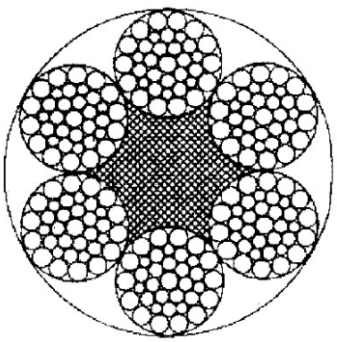
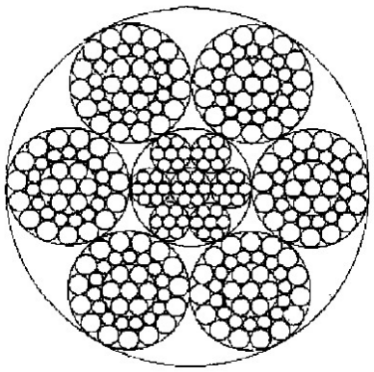
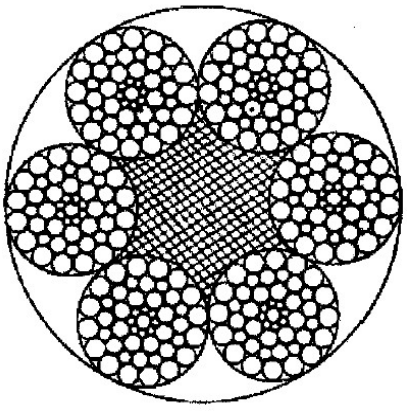
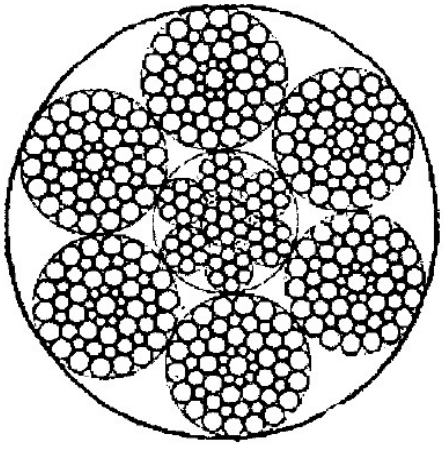
Flaw Detection

- Qualitative Flaw Detection
- Quantitative Flaw Detection
- High Repeatability
- High Accuracy
- Waveform Inspection Diagram Output
- Statistical Inspection Result Table Output

SYSTEM FEATURES

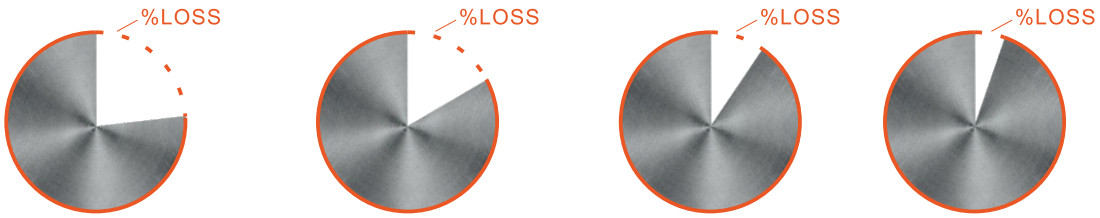
M-Regulator Field Strength	< 50mT	Sensor Dissipation Power	<50mW
Continual Detection Capacity	$>10^4$ m	Sensing Range	0-30mm
Detection Response Time	≤0.5ms	Sensor Lifetime	$>27*10^4$ hours
E/M Sensitivity	≥1.0V/mT	S/N Ratio	S／N>85dB
Working Temperature	-20–50 ℃	Relative Humidity	<95%
Storage Temperature	-40–60 ℃	Cleaning	Volatile organic solvent (ABS safe, Insulation safe, Non-toxic, Non-conductive)
Charge Time:	4-5 hours	Service Time:	>8 hours

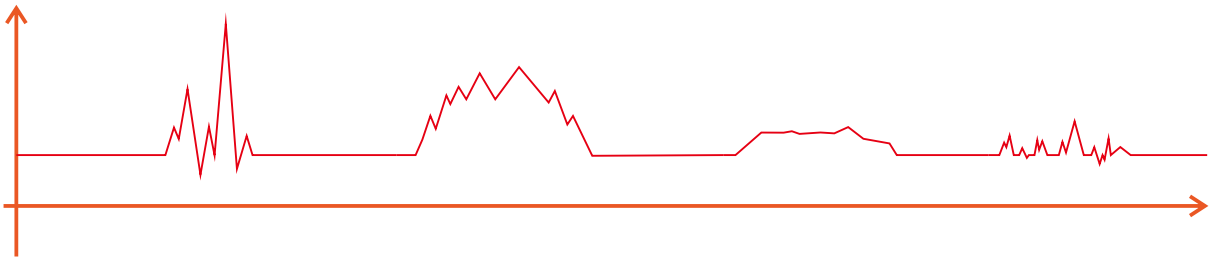
PRODUCT SPECIFICATIONS

MODEL	ROPE DIAMETER SPECS	SAMPLE REMARK
TS-X1124	ϕ 6mm – 24mm	 6×7+FC ϕ8  6×9W+IWR ϕ15  6×19S+FC ϕ20  6×19W+IWR ϕ24
TS-X1142	ϕ 22mm – 42mm	 6×26WS+IWR ϕ25  6×31WS+IWR ϕ30  6×29Fi+FC ϕ35  6×29Fi+IWR ϕ40
TS-X1160	ϕ 40mm – 65mm	 6×36WS+FC ϕ45  6×37S+IWR ϕ50
TS-X1160X	ϕ 40mm – 70mm	 6×49SWS+FC ϕ55  6×55SWS+IWR ϕ60

SYSTEM PERFORMANCE

Broken Wire Fatigue Abrasion Corrosion



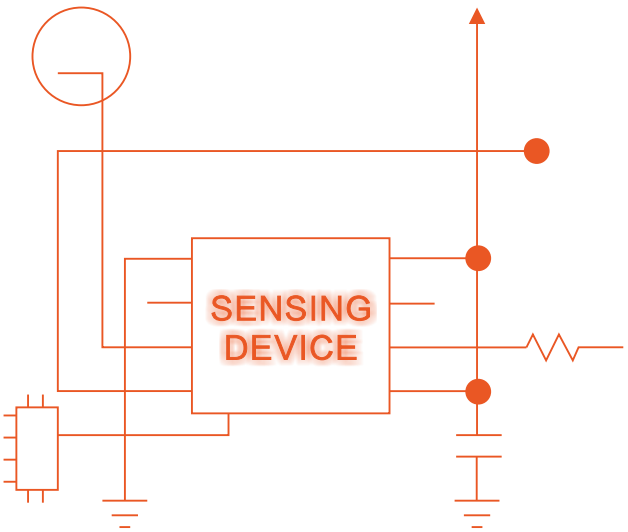


Qualitative Inspection

FDSys.P is able to inspect the wire rope and determine the defect types, such as Local Fault(LF) or Loss of Matallic Area (LMA).

Quantitative Inspection

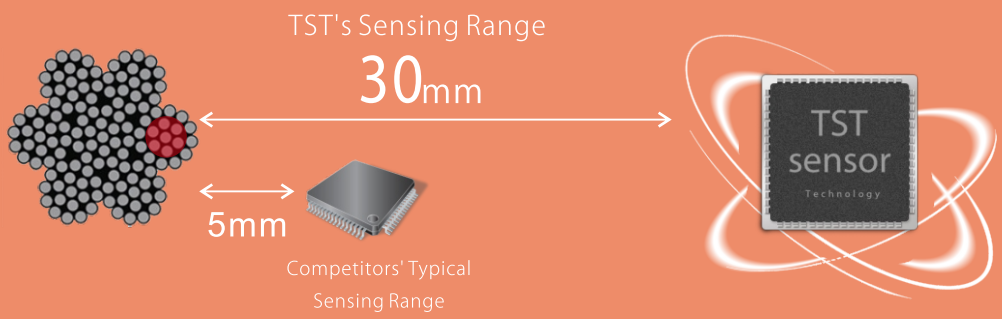
FDSys.P is able to inspect the wire rope and determine the respective defect values and severity with respect to the % loss of cross sectional metallic area and output in the statistical table with % values and positions.



Reliable Inspection

With the advanced sensor technology, FDSys.P is able to detect the defects with high repeatability and accuracy

SYSTEM PERFORMANCE

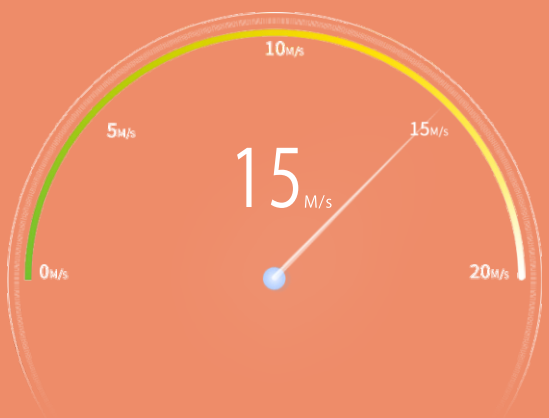


Wide Range Inspection

Due to the optimization of sensor array, the sensor of FDSys.P is able to pick up signals at wide range from the target and inspect the wire rope without interfering the relative movement between rope and device so that good passing ability is achieved. Work effeciency and operation safety is assured.

High Speed Inspection

FDSys.P is able to inspect the wire rope at a high speed without compromising the inspection performance and result.



Intelligent Inspection

FDSys.P is integrated with intelligent data analysis and processing algorithm on a user-friendly operating interface to provide a unmatchable inspection experience and solution.

INSPECTION PROCESS

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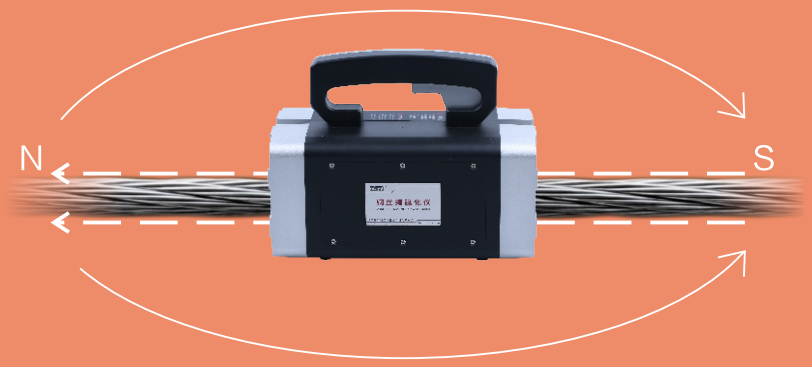

Field Regulating (Magnetizing)

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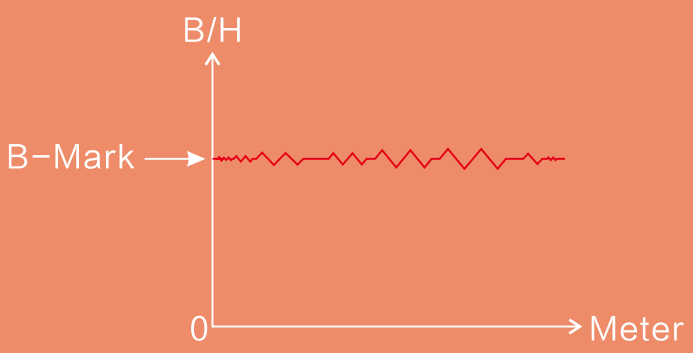
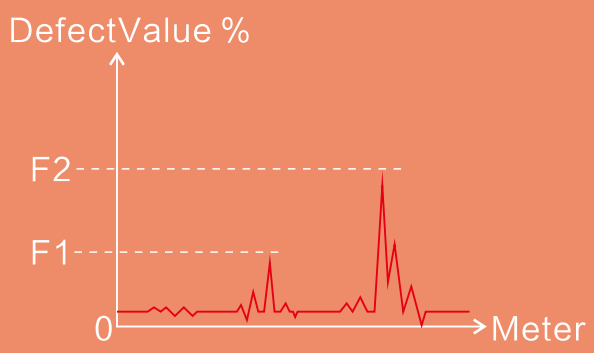
BENCHMARKING — INSPECTING





INSPECTION PROCESS

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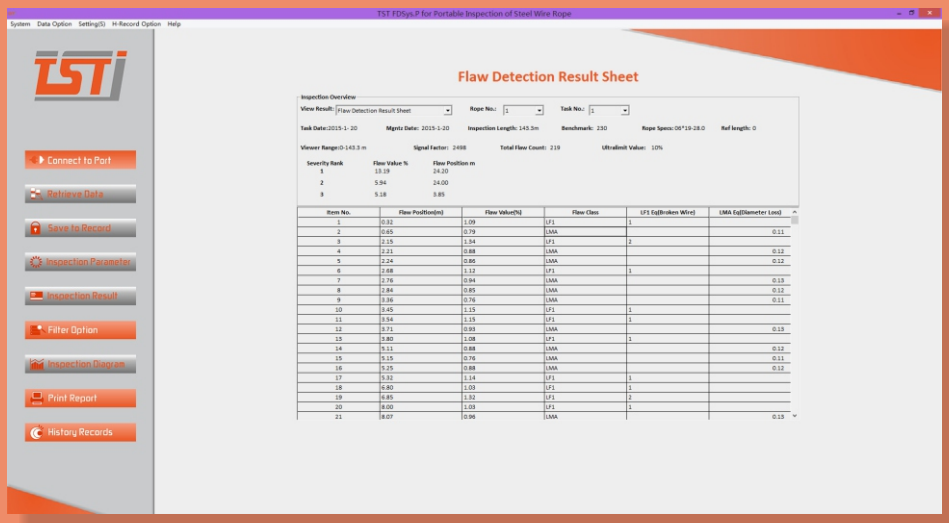

Data Uploading & Analysis

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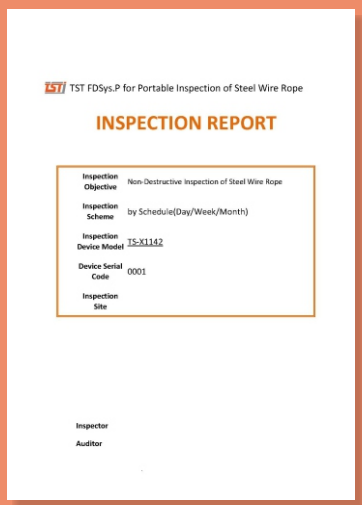
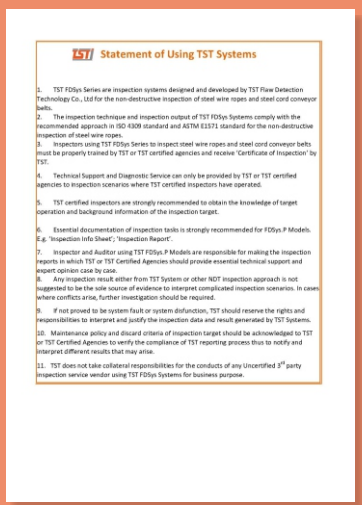

TST FDSys.P for Portable Inspection of Steel Wire Rope

INSPECTION REPORT

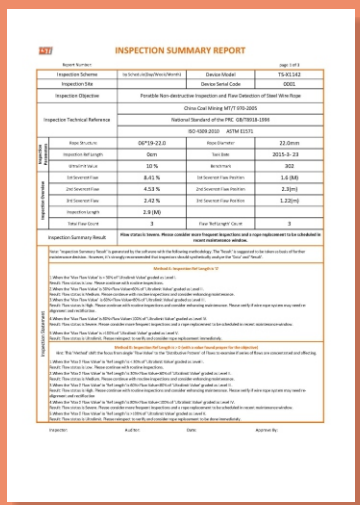
Inspection Objective	Non-Destructive Inspection of Steel Wire Rope
Inspection Scheme	by Schedule(Day/Week/Month)
Inspection Device Model	TS-X1142
Device Serial Code	0001
Inspection Site	

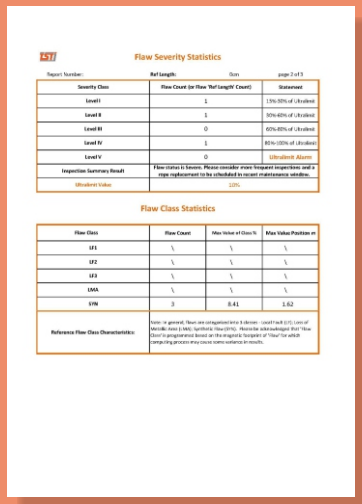
Inspector

Auditor

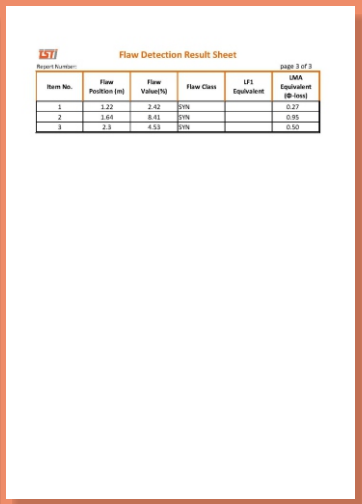

Statement of Using TST Systems

1. TST FDSys Series are inspection systems designed and developed by TST Flaw Detection Technology Co., Ltd for the non-destructive inspection of steel wire ropes and steel cord conveyor belts.
2. The inspection technique and inspection output of TST FDSys Systems comply with the recommended approach in ISO 4309 standard and ASTM E1571 standard for the non-destructive inspection of steel wire ropes.
3. Inspectors using TST FDSys Series to inspect steel wire ropes and steel cord conveyor belts must be properly trained by TST or TST certified agencies and receive 'Certificate of Inspection' by TST.
4. Technical Support and Diagnostic Service can only be provided by TST or TST certified agencies to inspection scenarios where TST certified inspectors have operated.
5. TST certified inspectors are strongly recommended to obtain the knowledge of target operation and background information of the inspection target.
6. Essential documentation of inspection tasks is strongly recommended for FDSys.P Models. E.g. 'Inspection Info Sheet'; 'Inspection Report'.
7. Inspector and Auditor using TST FDSys.P Models are responsible for making the inspection reports in which TST or TST Certified Agencies should provide essential technical support and expert opinion case by case.
8. Any inspection result either from TST System or other NDT inspection approach is not suggested to be the sole source of evidence to interpret complicated inspection scenarios. In cases where conflicts arise, further investigation should be required.
9. If not proved to be system fault or system disfunction, TST should reserve the rights and responsibilities to interpret and justify the inspection data and result generated by TST Systems.
10. Maintenance policy and discard criteria of inspection target should be acknowledged to TST or TST Certified Agencies to verify the compliance of TST reporting process thus to notify and interpret different results that may arise.
11. TST does not take collateral responsibilities for the conducts of any Uncertified 3rd party inspection service vendor using TST FDSys Systems for business purpose.


INSPECTION SUMMARY REPORT


Flaw Severity Statistics

Flaw Class Statistics


Flaw Detection Result Sheet

Item No.	Flaw Position (m)	Flaw Value(%)	Flaw Class	LF1 Equivalent	LMA Equivalent (dB-loss)
1	1.22	2.42	SYN		0.27
2	1.64	8.41	SYN		0.95
3	2.3	4.53	SYN		0.50

Inspection report