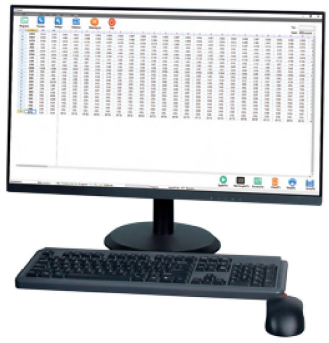
SPARK DIRECT READING SPECTROMETER (STANDARD TYPE)



OES-R420



computer (included)

- Widely used in metallurgy, casting, machinery, iron and steel and non-ferrous metal industries, etc.
- Can be used for sample analysis of metals and their alloys such as Fe, Al, Cu, Ni, Co, Mg, Ti, Zn, Pb, Sn, Mn, etc.
- It can automatically calibrate the pixel drift to ensure the stability of the optical system
- Fractional exposure is used to lower the detection limit of trace elements
- Equipped with a coaxial spinning air excitation stage, pressurized self-purge, excitation for thousands of times without cleaning
- Supports intelligent grade recognition, automatic carbon equivalent calculation, etc.
- The software is available in multiple languages (Chinese, English, German, Spanish)

SPECIFICATION

Code		OES-R420	OES-R530
Optical system	spectral range	160~500nm	130~800nm*
	Lightroom material	cast aluminum	cast iron
	detector	multiple CCD detectors, unlimited maximum number of detection channels	
	optical system construction	paschen-runge construction, grating focal length 500mm, roland circle diameter: 500mm	
	raster scribing	2700 lines/mm	
	resolution	better than 0.01nm (line resolution 0.7407nm/mm, pixel resolution 0.005926nm)	
	pixel dimension	8μm	
	dispersion	class I: 0.74nm/mm	
Curve	standard curve	low alloy steel **(A1)**, Cr-Ni stainless steel **(A2)** and Al-Si-Cu **(B1)**	
	customized curve	curves can be added or customized for special base materials (Mg, Ti, Pb, Sn, Mn, etc.)	
Excitation source	excitation frequency	20~1000Hz	
	excitation current	90A	
	excitation voltage	190V	
Spark stand	discharge parameter	inductance: 120μH, resistance: 3.5Ω, capacitance: 5μF, voltage: 380V	
	dimension	125×95mm, max. load 50kg	
	lens	one-piece lens isolation valve	
	excitation electrode	tungsten electrode	
Gas supply	argon quality	purity: 99.999%, pressure: ≥0.6MPa	
	flow rate	tidal flushing mode, excitation: 8L/min, standby: 60ml/min	
General analysis time		<40s	
Data processing		after instrument excitation, acquisition and countback to independently control the integration exposure time of different CCDs	
Work environment		20~25°C, <70%RH	
Power supply		AC220V, 50Hz, 1Ø, 16A, 2.5KW, ground resistance <4Ω	
Dimension (L×W×H)		470×872×435mm	
Net weight		80kg	100kg

* The instrument can be optionally equipped to analyze elements N, Li, Na, and K

STANDARD DELIVERY

Main unit	1 pc
Computer	1 set
Printer	1 pc
Voltage regulator	1 pc
Calibration sample	1 set
Electrode brush (OES-R420-BRUSH)	1 set
Analysis and calibration software	1 set
Consumable and spare parts	1 set *

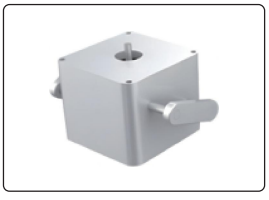
*Including polarimeter, pressure reducing valve, electrode brush and other consumable and spare parts



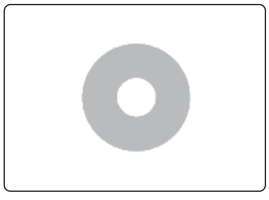
spectral sample grinder (**optional**)



lathe (**optional**)



small sample fixture (**optional**)



gasket (**optional**)

OPTIONAL ACCESSORY

Spectral standard sample	**MSS series**	select standard sample based on the test material
Spectral sample grinder	**OES-MY100**	Ø350mm, 380V
Lathe	**OES-R420-LATHE**	220×300mm, 220V
Small sample fixture	**OES-R420-RODLIKE**	Ø3.1~7mm regular bar sample
	OES-R420-FILIFORM	Ø0.5~3mm filament sample
Gasket	**OES-R420-GASKET1**	copper, ID6mm
	OES-R420-GASKET2	copper, ID8mm
	OES-R420-GASKET3	boron nitride, ID4mm
	OES-R420-GASKET4	boron nitride, ID6mm
N analysis module	**OES-R530-MC-N**	the measurement range can be customized, used with OES-R530
Na analysis module	**OES-R530-MC-NA**	
K analysis module	**OES-R530-MC-K**	
Li analysis module	**OES-R530-MC-LI**	

TEST CURVES *

Fe base curves	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**
	Low alloy steel**	Cr-Ni stainless steel	High speed tool steel	Cr-Mn stainless steel	Nodular iron	High Ni cast iron	High Cr cast iron	Pure iron
Al base curves	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	
	Al-Si-Cu	Low-Al	Al-Mg-Si	Al-Zn	Al-Si	Al-Cu	Pure Al	
Cu base curves	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
	Pure Copper	Pb-Brass	Sn-Bronze	P-Bronze	Al-Bronze	Cu-Ni	Cu-Ni-Zn	Si-Bronze
	C9	**C10**	**C11**	**C12**	**C13**	**C14**	**C15**	**C16**
	Mn-Brass	Fe-Brass	Be-Bronze	Mn-Bronze	Sn-Brass	Cu-Ni-Mn	Ni-Al-Si-Cu	Cu-Ni-Fe
Ni base curves	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**		
	Nimonic	Inconel	Monel	Hastelloy C	Hastelloy B	Incoloy		
Co base curves	**E1**	**E2**	**E3**	**E4**				
	Co-Cr-W	Co-Cr-Ni-W	Co-Ni-Cr-Mo	Co-Cr-Mo				
Zn base curves	**F1**	**F2**						
	Zamak	Zn-Al						
Mg base curves	**G1**	**G2**						
	Mg-Al	Mg-Zn						
Sn base curves	**H1**	**H2**	**H3**					
	Sn-Sb	Sn-Pb	Sn-Pb-Sb					
Pb base curves	**K1**							
	Pb–Sb							
Ti base curve	**L1**							
	Ti-Al-V							

*Low alloy steel **(A1)**, Cr-Ni stainless steel **(A2)** and Al-Si-Cu **(B1)** are standard curves and all others are optional
The specific range of curve elements is shown in the attached curve table
Low alloy steel **(A1) includes carbon and medium-low alloy steel

OES-R SERIES TEST CURVE TABLES

FE BASE CURVES

Curve number	A1	A2	A3	A4	A5	A6	A7	A8
Elemental content (%)	Low alloy steel*	Cr-Ni stainless steel	High speed tool steel	Cr-Mn stainless steel	Nodular iron **	High Ni cast iron**	High Cr cast iron **	Pure iron
C	0.0015-1.5	0.005-2.0	0.08-2.5	0.006-2.0	0.9-4.5	1.5-4.5	0.9-4.5	0.001-0.15
Si	0.005-2.0	0.005-2.0	0.005-2.0	0.003-2.0	0.1-5.5	0.1-6.0	0.1-5.5	0.001-0.5
Mn	0.005-2.5	0.002-2.5	0.005-2.0	2.0-25	0.005-2.5	0.005-7.0	0.005-2.5	0.001-0.5
P	0.001-0.1	0.002-0.1	0.003-0.1	0.003-0.2	0.003-1.0	0.003-0.3	0.003-1.0	0.001-0.04
S	0.001-0.1	0.001-0.1	0.001-0.1	0.003-0.1	0.003-0.2	0.003-0.2	0.003-0.2	0.001-0.04
Cr	0.001-5.0	5-35	0.01-7.9	0.005-30	0.005-5.0	0.005-5.0	0.005-5.0	0.001-0.2
Ni	0.002-5.0	0.004-30***	0.005-2.5	0.005-7	0.002-5.0	5.0-35.0	0.002-5.0	0.002-0.35
Mo	0.003-2.0	0.005-4.0	0.01-10.0	0.006-2.5	0.003-2.0	0.003-2.0	0.003-2.0	-
Cu	0.002-1.5	0.005-4.0	0.005-1.5	0.006-2.0	0.005-2.0	0.005-6.0	0.005-2.0	0.002-0.3
W	0.001-2.0	0.002-1.0	1.0-20.0	0.006-0.5	0.006-1.0	0.006-1.0	0.006-1.0	-
V	0.002-1.5	0.002-0.5	0.01-6.0	0.006-1.5	0.001-1.0	0.005-0.5	0.001-1.0	-
Ti	0.001-1.0	0.003-1.0	0.004-0.5	0.003-1.0	0.001-0.5	0.006-0.2	0.001-0.5	-
Nb	0.001-0.5	0.005-3.0	0.002-1.0	0.006-3.0	0.002-1.0	0.005-0.5	0.002-1.0	-
Al	0.001-1.5	0.004-1.5	0.005-0.2	0.004-0.5	0.001-0.4	0.006-0.2	0.001-0.4	0.001-0.65
Mg	-	-	-	-	0.001-0.1	0.003-0.1	0.001-0.1	-
Ce	-	-	-	-	0.001-0.1	0.003-0.05	0.001-0.1	-
Zr	0.004-0.5	-	-	-	0.003-0.1	-	0.003-0.1	-
Co	0.001-0.5	0.003-0.5	0.006-10	0.003-0.5	0.001-0.2	-	0.001-0.2	-
B	0.0008-0.02	0.002-0.02	-	0.002-0.02	0.003-0.2	0.003-0.1	0.003-0.2	-
Fe	REF	REF	REF	REF	REF	REF	REF	REF
Description	La, As, Pb, Sn, Sb, Bi, Ca, Zn, Se, etc. in iron base can be customized							

*Low alloy steel **(A1)** includes carbon and medium-low alloy steel
**Cast iron samples are required to be whitening treated samples
***Stainless steel in the nickel content of the standard configuration for the 0.004-30%, can be extended up to 40% according to requirements

AL BASE CURVES

Curve number	B1	B2	B3	B4	B5	B6	B7
Elemental content (%)	Al-Si-Cu	Low-Al	Al-Mg-Si	Al-Zn	Al-Si	Al-Cu	Pure Al
Cd	0.002-0.25	0.001-0.2	0.002-0.2	0.002-0.2	0.001-0.25	0.002-0.2	0.005-0.1
Cr	0.002-0.5	0.002-0.4	0.002-0.5	0.005-0.5	0.002-0.5	0.002-0.3	0.005-0.1
Cu	0.5-8.0	0.002-1.0	0.002-2.0	0.01-3.0	0.002-2.0	0.01-8.0	0.005-0.1
Fe	0.005-2.0	0.002-1.5	0.005-1.5	0.03-1.5	0.005-1.5	0.005-1.5	0.005-0.2
Mg	0.005-2.0	0.002-1.5	0.005-15.0	0.01-4.5	0.005-2.0	0.005-2.5	0.005-0.2
Mn	0.005-1.0	0.001-0.5	0.005-1.0	0.01-1.0	0.005-1.0	0.005-1.0	0.005-0.1
Ni	0.005-1.5	0.003-0.5	0.005-1.0	0.01-1.0	0.005-1.5	0.005-2.0	0.005-0.1
P	0.005-0.02	0.005-0.02	0.005-0.02	0.005-0.02	0.005-0.02	0.005-0.02	0.01-0.02
Pb	0.005-0.4	0.002-0.2	0.005-0.5	0.005-0.2	0.005-0.4	0.005-0.2	0.005-0.1
Si	1.0-16.0	0.005-1.5	0.01-25.0	0.01-1.0	1-25.0	0.005-1.5	0.005-0.2
Sn	0.0005-1.0	0.003-0.2	0.005-0.5	0.005-0.2	0.003-0.5	0.005-0.2	0.005-0.1
Ti	0.003-0.5	0.003-0.3	0.003-0.5	0.003-0.5	0.003-0.5	0.001-0.5	0.005-0.05
Zn	0.005-3.0	0.005-1.5	0.01-3.0	0.01-10.0	0.005-1.5	0.005-0.5	0.005-0.2
Al	REF	REF	REF	REF	REF	REF	REF
Description	Sb, Sr, V, Zr, Ag, As, B, Be, Ca, Ce, Ga, Co, etc. in Al base can be customized						

CU BASE CURVES

Curve number	C1	C2	C3	C4	C5	C6	C7	C8
Elemental content (%)	Pure Copper/ Red Copper	Pb-Brass	Sn-Bronze	P-Bronze	Al-Bronze	Cu-Ni	Cu-Ni-Zn	Si-Bronze
Al	0.0005-0.1	0.001-1.0	0.001-0.2	0.001-0.1	0.5-12.0	0.001-0.5	0.001-0.1	0.001-0.1
As	0.003-0.1	0.003-0.3	0.003-0.2	0.003-0.2	0.003-0.1	0.003-0.05	0.003-0.1	0.003-0.1
Be	-	-	-	-	-	-	-	-
Bi	0.001-0.1	-	0.002-0.1	-	-	0.001-0.02	0.001-0.01	-
Cd	0.0005-0.05	0.002-0.01	0.001-0.01	-	-	-	-	-
Co	0.0005-0.1	0.001-0.15	0.003-0.15	-	-	0.006-0.2	0.006-0.25	-
Fe	0.0009-0.1	-	0.003-0.35	0.003-0.35	0.005-6.5	0.03-1.0	0.03-1.0	0.003-2.0
Mg	0.001-0.02	0.003-1.0	-	0.005-0.01	0.005-0.1	0.003-0.15	0.003-0.15	-
Mn	0.0005-0.1	-	0.003-0.2	0.005-0.5	0.005-3.0	0.005-1.5	0.005-1.0	0.003-1.5
Ni	0.001-0.2	0.001-0.2	0.005-2.0	0.005-1.5	0.01-7.0	0.5-35.0	5.0-20.0	0.01-3.5
P	0.001-0.05	0.005-1.0	0.003-0.6	0.01-1.0	0.003-0.05	0.003-0.05	0.01-0.1	0.003-0.1
Pb	0.002-0.1	0.003-0.1	0.005-10.0	0.005-1.5	0.002-0.2	0.002-0.05	0.002-2.0	0.01-0.5
S	0.0007-0.1	0.005-5.0	-	0.002-0.1	-	0.002-0.1	0.002-0.1	-
Sb	0.001-0.05	0.001-0.01	0.001-0.6	0.001-0.5	-	0.001-0.02	0.001-0.02	0.001-0.01
Si	0.001-0.1	0.001-0.1	0.004-0.15	0.004-0.15	0.004-0.5	0.002-0.2	0.002-1.0	0.004-4.0
Sn	0.001-0.1	0.005-1.0	0.01-12.0	0.1-12.0	0.005-0.3	0.005-0.1	0.005-0.2	0.003-0.5
Ti	-	-	-	-	-	-	-	-
Zn	0.001-0.5	0.5-42.0	0.005-12.0	0.002-1.5	0.003-2.0	0.005-1.0	10.0-35.0	0.005-3.5
Cr	0.001-0.1	-	-	-	0.001-0.1	-	-	-
Cu	REF	REF	REF	REF	REF	REF	REF	REF
Description	Te, Se, C, B, Au, Ag, etc. in copper base can be customized							

Curve number	C9	C10	C11	C12	C13	C14	C15	C16
Elemental content (%)	Mn-Brass	Fe-Brass	Be-Bronze	Mn-Bronze	Sn-Brass	Cu-Ni-Mn	Ni-Al-Si-Cu	Cu-Ni-Fe
Al	0.001-4.0	0.001-0.5	0.001-0.5	0.001-0.1	0.001-1.0	0.001-0.5	0.001-8.0	0.001-0.1
As	-	-	-	0.003-0.05	0.003-0.2	0.003-0.05	0.003-0.1	0.003-0.02
As	-	-	0.1-3.5	-	-	-	-	-
Be	-	0.002-0.01	0.002-0.01	-	0.002-0.1	0.001-0.01	0.002-0.01	0.001-0.02
Cd	-	-	-	-	0.001-0.15	-	0.001-0.1	-
Co	0.004-1.0	-	0.003-3.0	-	-	-	0.004-3.0	-
Fe	0.003-2.0	0.5-3.0	0.003-0.6	0.003-1.0	0.003-0.5	0.01-0.6	0.003-4.0	0.3-2.0
Mg	-	-	0.005-0.2	-	-	0.003-0.1	0.001-0.1	0.003-0.15
Mn	0.5-10.0	0.001-1.0	0.005-0.1	0.5-6.0	0.001-1.0	0.1-15.0	0.001-2.5	0.2-1.5
Ni	0.005-4.5	0.005-1.0	0.005-2.5	0.005-1.0	0.01-2.0	0.5-5.0	0.002-8.0	4.0-35.0
P	0.003-0.05	0.003-0.15	-	0.003-0.05	0.003-0.05	0.003-0.05	0.003-0.15	0.003-0.05
Pb	0.005-2.0	0.005-1.5	0.005-0.06	0.005-1.0	0.005-0.5	0.002-0.05	0.005-1.0	0.002-0.1
S	-	-	-	-	-	0.002-0.05	0.001-0.02	0.002-0.05
Sb	0.001-0.01	0.001-0.25	-	0.001-0.05	0.001-0.1	0.001-0.02	0.001-0.5	0.001-0.02
Si	0.001-1.5	0.001-0.5	0.004-0.5	0.004-0.3	0.001-1.0	0.002-0.5	0.001-5.0	0.002-0.5
Sn	0.005-1.5	0.005-0.8	0.005-0.2	0.005-0.3	0.1-2.0	-	0.005-0.2	0.005-0.1
Ti	-	-	0.003-0.3	-	-	-	-	-
Zn	0.5-40.0	0.5-40.0	0..005-0.5	0.005-1.5	0.5-40.0	0.005-0.5	0.5-40.0	0.005-1.0
Cr	-	-	-	-	-	-	-	-
Cu	REF	REF	REF	REF	REF	REF	REF	REF
Description	Te, Se, C, B, Au, Ag, etc. in copper base can be customized							

NI BASE CURVES

Curve number	D1	D2	D3	D4	D5	D6
Elemental content (%)	Nimonic	Inconel	Monel	Hastelloy C	Hastelloy B	Incoloy
Al	0.005-6.0	0.005-6.0	0.005-4.5	0.005-1.0	0.005-1.0	0.005-2.0
C	0.005-0.3	0.005-0.2	0.005-0.5	0.005-0.25	0.005-0.2	0.005-0.5
Co	0.01-20.0	0.005-1.0	0.005-0.5	0.005-3.0	0.005-2.5	0.005-1.0
Cr	8.0-25.0	10.0-25.0	0.005-0.5	15.0-25.0	0.005-10.0	5.0-25.0
Cu	0.005-0.5	0.005-0.5	20.0-32.0	0.005-1.5	0.005-0.5	0.005-3.0
Fe	0.015-3.5	0.01-20.0	0.005-4.0	0.5-20.0	0.01-10.0	20.0-52.0
Mg	0.005-0.05	0.005-0.05	0.005-0.1	-	-	-
Mn	0.005-1.2	0.005-1.2	0.005-3.0	0.005-1.5	0.005-3.0	0.005-2.0
Mo	0.01-10.0	0.01-10.0	0.005-0.1	5.0-23.0	25.0-32.0	0.005-6.5
Nb	0.005-0.5	0.005-7.0	0.005-0.5	-	-	0.005-0.5
Si	0.005-1.0	0.005-0.5	0.005-4.5	0.005-1.3	0.005-1.0	0.005-2.5
Ti	0.005-6.0	0.005-3.0	0.005-1.5	0.005-0.5	-	0.005-4.0
V	0.005-0.6	0.005-0.5	-	0.005-0.5	0.005-0.5	0.005-0.1
W	0.002-4.5	0.005-0.5	-	0.5-6.0	0.005-0.8	0.5-7.0
Zr	0.005-0.15	0.005-0.05	0.005-0.1	-	-	-
Ni	REF	REF	REF	REF	REF	REF
Description	P, S, Pb, Ce, B, etc. in nickel base can be customized					

CO BASE CURVES

Curve number	E1	E2	E3	E4
Elemental content (%)	Co-Cr-W	Co-Cr-Ni-W	Co-Ni-Cr-Mo	Co-Cr-Mo
Al	0.005-0.48	0.005-0.48	0.005-0.48	0.005-0.48
C	0.005-1.0	0.005-1.0	0.005-0.5	0.005-0.5
Cr	18.0-31.0	18.0-31.0	18.0-31.0	18.0-31.0
Cu	0.005-0.3	0.005-0.3	0.005-0.05	0.005-0.05
Fe	0.005-9.0	0.005-3.0	0.03-1.0	0.005-3.0
Mn	0.005-2.0	0.005-2.0	0.005-0.3	0.005-1.0
Mo	0.005-1.5	0.005-1.0	1.0-10.0	1.0-8.5
Nb	0.005-4.2	0.005-0.5	0.005-0.5	0.005-0.5
Ni	0.005-3.0	8.0-25.0	10.0-36.0	0.005-5.0
Si	0.005-1.0	0.005-1.0	0.005-1.0	0.005-1.0
Ti	0.005-3.0	0.005-0.05	-	0.005-0.05
W	3.0-16.0	3.0-16.0	0.005-0.1	0.005-0.1
Co	REF	REF	REF	REF
Description	V, P, S, Ta, Sn, B, etc. in cobalt base can be customized			

ZN BASE CURVES

Curve number	F1	F2
Elemental content (%)	Zamak	Zn-Al
Al	0.05-6.0	6.0-30.0
Cd	0.005-0.04	0.005-0.04
Cu	0.005-3.0	0.005-3.0
Fe	0.005-0.1	0.005-0.1
Mg	0.005-0.1	0.005-0.1
Ni	0.005-0.05	0.005-0.05
Pb	0.005-0.03	0.005-0.03
Si	0.005-0.05	0.005-0.05
Sn	0.005-0.01	0.005-0.02
Ti	0.005-0.3	0.005-0.3
Zn	REF	REF
Description	Sb, etc. in zinc base can be customized	

MG BASE CURVES

Curve number	G1	G2
Elemental content (%)	Mg-Al	Mg-Zn
Al	1.0-12.0	0.005-0.12
Cu	0.005-0.3	0.005-0.15
Fe	0.005-0.05	0.005-0.02
Mn	0.005-1.0	0.005-0.3
Ni	0.005-0.05	0.005-0.1
Si	0.005-2.0	0.005-0.3
Zn	0.005-4.0	1.0-7.0
Zr	-	0.005-1.0
Mg	REF	REF
Description	Ce, Be, La, Ag, etc. in magnesium base can be customized	

SN BASE CURVES

Curve number	H1	H2	H3
Elemental content (%)	Sn-Sb	Sn-Pb	Sn-Pb-Sb
Al	0.005-0.01	0.005-0.01	0.005-0.01
As	0.005-0.1	0.005-0.1	0.005-0.1
Bi	0.005-0.2	0.005-0.25	0.005-0.1
Cd	0.005-0.1	0.005-0.02	0.005-0.02
Cu	0.005-9.0	0.005-0.5	0.005-5.0
Fe	0.005-0.1	0.005-0.2	0.005-0.1
Ni	0.005-0.1	0.005-0.05	0.005-0.1
Pb	0.005-3.5	2.0-40.0	1.0-40.0
Sb	0.005-14.0	0.005-0.5	1.0-14.0
Zn	0.005-0.05	0.005-0.1	0.005-0.05
Sn	REF	REF	REF
Description	Ag, In, Au, Te, etc. in stannum base can be customized		

PB BASE CURVES

Curve number	K1
Elemental content (%)	Pb–Sb
As	0.001-0.7
Bi	0.001-0.1
Cd	0.0005-0.02
Cu	0.001-0.3
Fe	0.001-0.01
Ni	0.001-0.06
S	0.001-0.015
Sb	0.1-11.5
Sn	0.001-1.5
Zn	0.001-0.1
Pb	REF

TI BASE CURVES

Curve number	L1
Elemental content (%)	Ti-Al-V
Al	0.005-7.0
C	0.005-0.1
Cr	0.005-6.5
Cu	0.005-0.62
Fe	0.005-1.9
Mn	0.005-5.0
Mo	0.005-11.0
Nb	0.005-2.75
Ni	0.005-1.0
S	0.005-0.01
Si	0.005-0.47
Sn	0.005-2.0
V	0.005-10.0
W	0.005-0.87
Zr	0.005-4.0
Ti	REF