



## **CENTAURUS SCINTILLATOR BACKSCATTERED DETECTOR**

### **THE COMPLETE DETECTOR SYSTEM**



#### **BACKSCATTER**

- **EXCELLENT LOW KV PERFORMANCE**
- **GOOD ATOMIC NUMBER RESOLUTION**
- **HIGH SPATIAL RESOLUTION**
- **OPERATES AT ALL PRESSURES**
- **COMPOSITION OR TOPOGRAPHY**
- **LOW NOISE**
- **DESIGNED TO FIT MOST MAKES OF CHAMBER**

#### **CATHODOLUMINESCENCE**

- **SENSITIVE CL DETECTOR**
- **300-650nm STANDARD**
- **OPTIONAL 185-850 & 400 -1200nm PHOTOMULTIPLIERS AVAILABLE**

**CENTAURUS** is a new style of Detector. It originally designed as a Backscattered Detector, a function that it performs particularly well in both the Compositional and Topographic modes. Combined with its versatile construction, and with a rapidly interchangeable tip, it may be converted in matter of seconds to a **Cathodoluminescence** Detector.

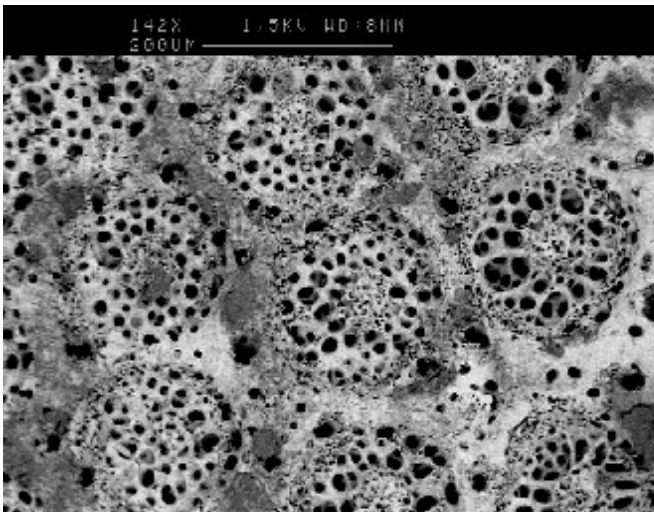
The versatility of **CENTAURUS** can provide you, in effect, with a complete Detector System!

## BACKSCATTER

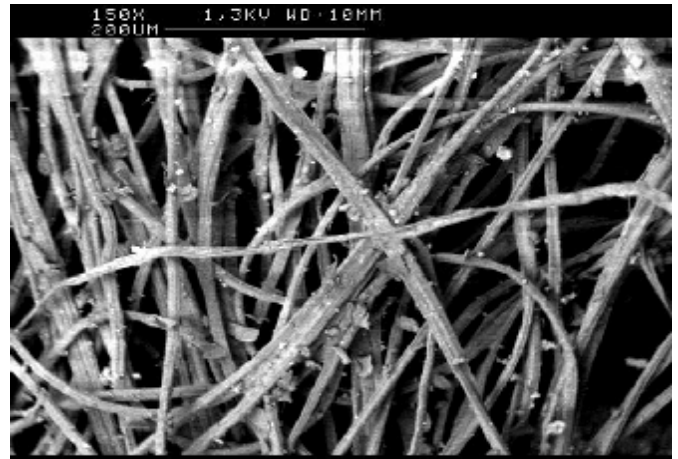
**CENTAURUS** uses a new design of scintillator detector (patented). This design gives high sensitivity, particularly at low KeVs and therefore the scintillator element may be made quite small whilst still achieving excellent results.

Its low Kiev performance makes imaging possible down to 0.5KeV. This is considerably lower than most users will ever require. However, its main low kV applications will be around 1.5KeV. This is the point where normal charging problems virtually disappear. **CENTAURUS** may therefore be used for imaging totally uncoated specimens with little risk of charging. This low KeV operation is particularly important for beam sensitive specimens such as semiconductors which may be damaged by the use of higher voltages.

**CENTAURUS** is also very efficient at high KeVs. Its tip, only 4mm in thickness, allows a very short working distance to be used. This, in turn, helps achieve high resolution images.



*BS Image at 1.5kV of "Sand Dollar"  
"uncoated"*



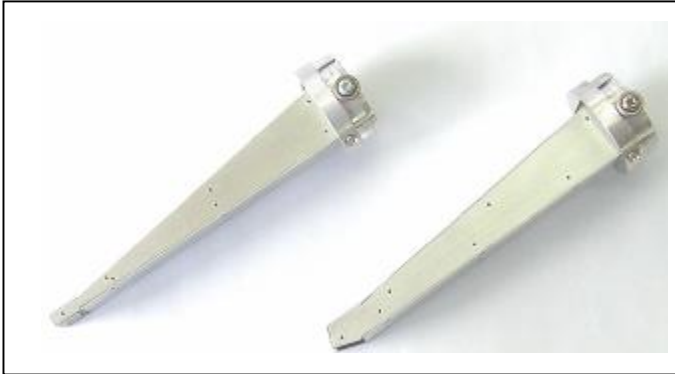
*Cloth image at 1.3kV*

The shape of its tip virtually overcomes the usual problems of other scintillator detectors where the image seen is a mixture of both compositional and topography. The topography content has been almost eliminated but by partially retracting the detector the topographic image may be obtained. A latch is provided to hold the detector in the partially retracted position

**CENTAURUS** has produced excellent results in FE SEMs, where high resolution is paramount. Its high sensitivity gives low noise pictures at very small probe currents.

It has also had great success in "Environmental" or "Low Vacuum" SEMs. In these, the electrons leaving the specimen are significantly retarded by their collisions with gas molecules giving them much lower energies. The low KeV ability of **CENTAURUS** is a great help in resolving them.

## CATHODOLUMINESCENCE

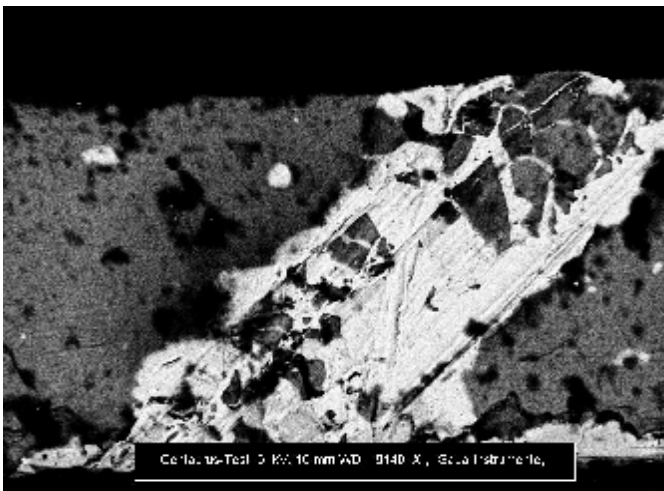


### *Interchangeable BS & CL Tips*

If an extended tube, 185-850nm, is used, there will be a small drop in Backscattered sensitivity

An infrared tube may also be fitted, but in this case, Backscattered imaging may no longer be viable. Note that although this tube is specified from 400-1200nm, it is very insensitive except near its peak of 800nm.

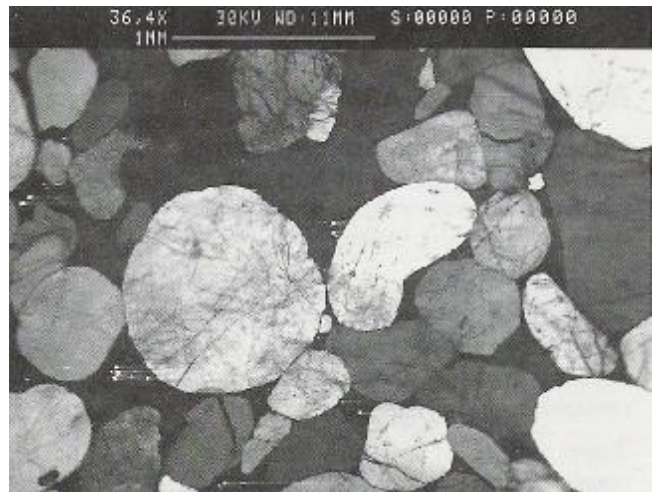
The change from backscattered mode to cathodo is simply carried out by changing the tip itself. All versions of the tip have a universal bayonet fit and are secured in place by two small screws which are hand tightened once the tip has been located in the fittings on the end on the tube.



*Solid at 5kV*

The **CENTAURUS** CL tip has a mirror at the end of a light guide. It has an increased thickness, 10mm, to increase its sensitivity. This is necessary due to the general low light level produced by CL specimens. The tip may be operated very close to the specimen, thereby collecting the photons from a large solid angle. The spectral response is limited to that of the photomultiplier tube used for Backscattered collection, 350-650nm is supplied as standard. Extended range tubes may be fitted where response into the red region is required.

These are easily interchangeable with the standard tube supplied and can be changed in a few minutes on site by the operator themselves.



*Sandstone Cathodoluminescence taken with Centaurus Detector*





*Centaurus Detector in use on Leo SEM chamber*

All **CENTAURUS** Detectors are custom manufactured to individual user requirements and specifications. It is designed to fit the majority of manufacturers past and present ranges of SEM. Versions of this product can also be supplied either with Bellows Sealing or Bellows Sealing and Motorised Retraction.

Please contact your local dealer or the factory for further information on your personal requirements

K.E.Developments is continually striving to keep its products at the leading edge of current technology. The product supplied may therefore differ in detail to that described in this brochure

## SPECIFICATIONS

Fully retractable assembly  
 Typical Retraction 115mm  
 Type. Length outside chamber 350mm  
 Fine position adjustment  $x = \pm 1 \text{ mm}$   
 (*Under vacuum*)  $y = \pm 10 \text{ mm}$   
 Free Standing Control Unit

Video Output Level configured for SEM  
 Power Supply Voltage 100,120 & 230Vac  
 Power Frequency 50-60Hz  
 Power consumption 8VA  
 Vacuum Interlock Logic "1" or "0"  
 Field Emission correction for some cold FE SEMs.  
 Auto Bandwidth control for some digital SEMs.

## BACKSCATTER

Detector Area 120sq mm  
 Thickness of tip under lens 4mm  
 Scintillator Life min 2 years  
 Atomic No Discrimination  $<0.1Z @ Z=30$   
 (*Compositional image*)  
 Topographic Image Yes  
 (*Tip Partially Retracted*)  
 Operating kV range 0.5-40kv+

## CATHODLUMINESCENCE

Spectral Range, standard 300-650nm  
 Peak 420nm  
 Alternative tubes for CL  
 Spectral Range 185-850nm  
 Peak 420nm  
 Spectral Range 400-1200nm  
 Peak 800nm  
 Area of mirror 120 sq mm  
 Thickness of tip under lens 10mm

**Warranty Period.** Two years from date of purchase.



## K.E.DEVELOPMENTS LIMITED

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