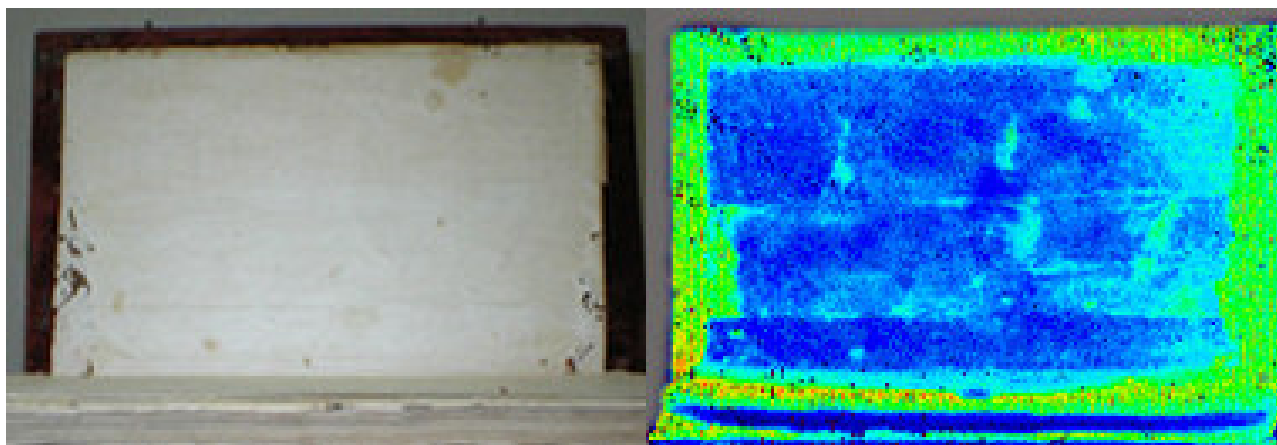
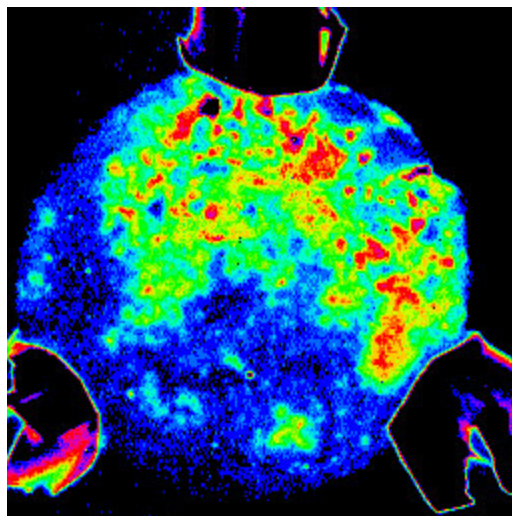
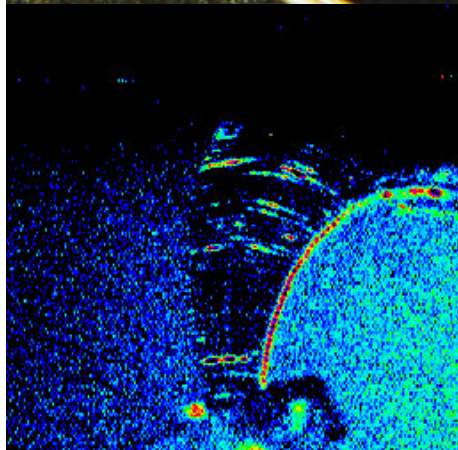
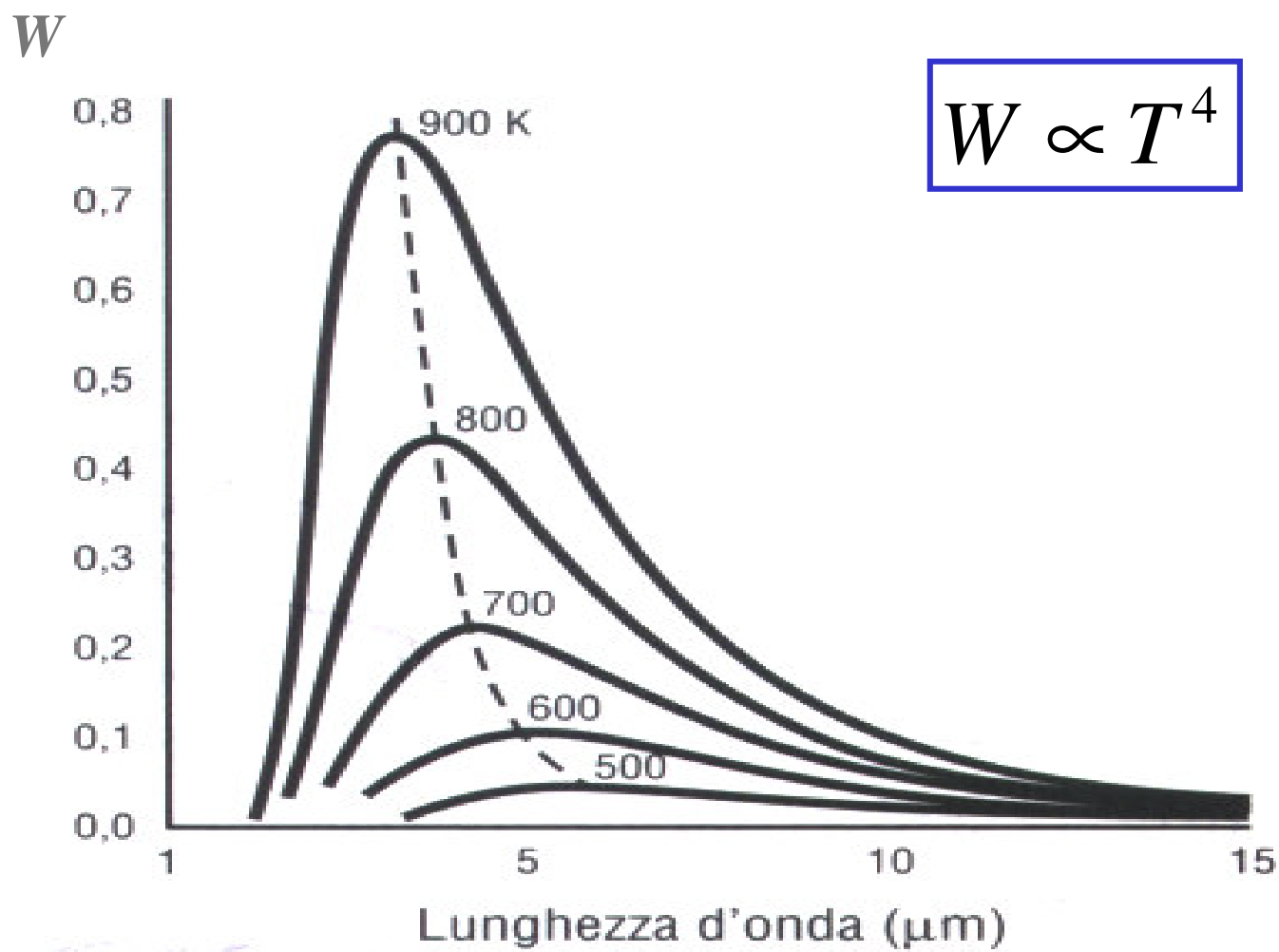


Termografia BBCC





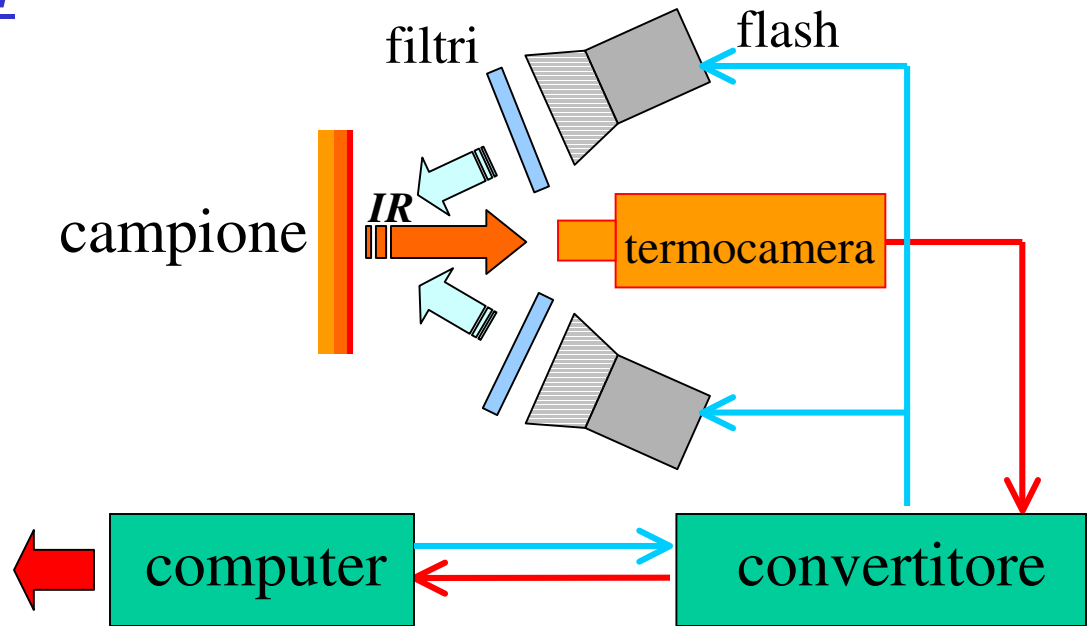
Termografia



Sequenza di termogrammi



**EVOLUZIONE DELLA
TEMPERATURA**



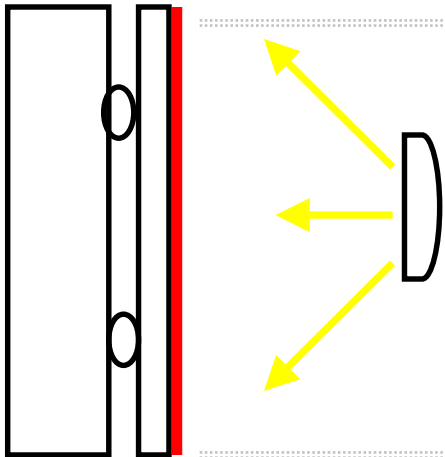
FLASH: 2 millisecondi

PERTURBAZIONE: circa 1°C

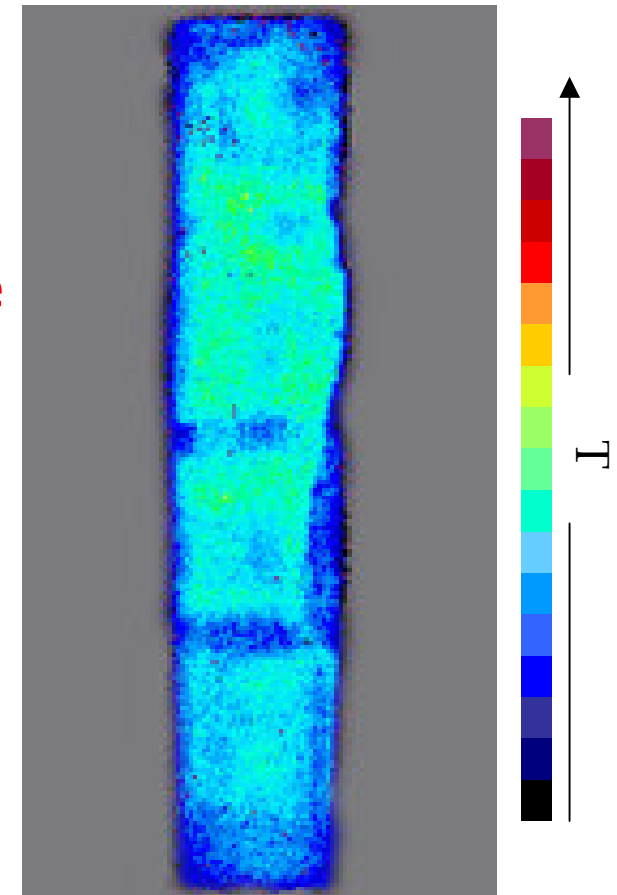
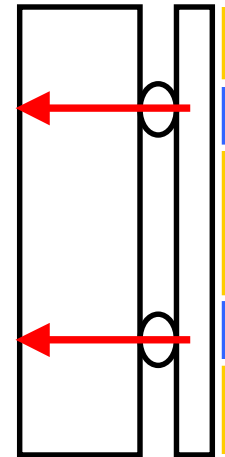
termogramma → Mappa termica della superficie

Mappa della struttura sotto la superficie

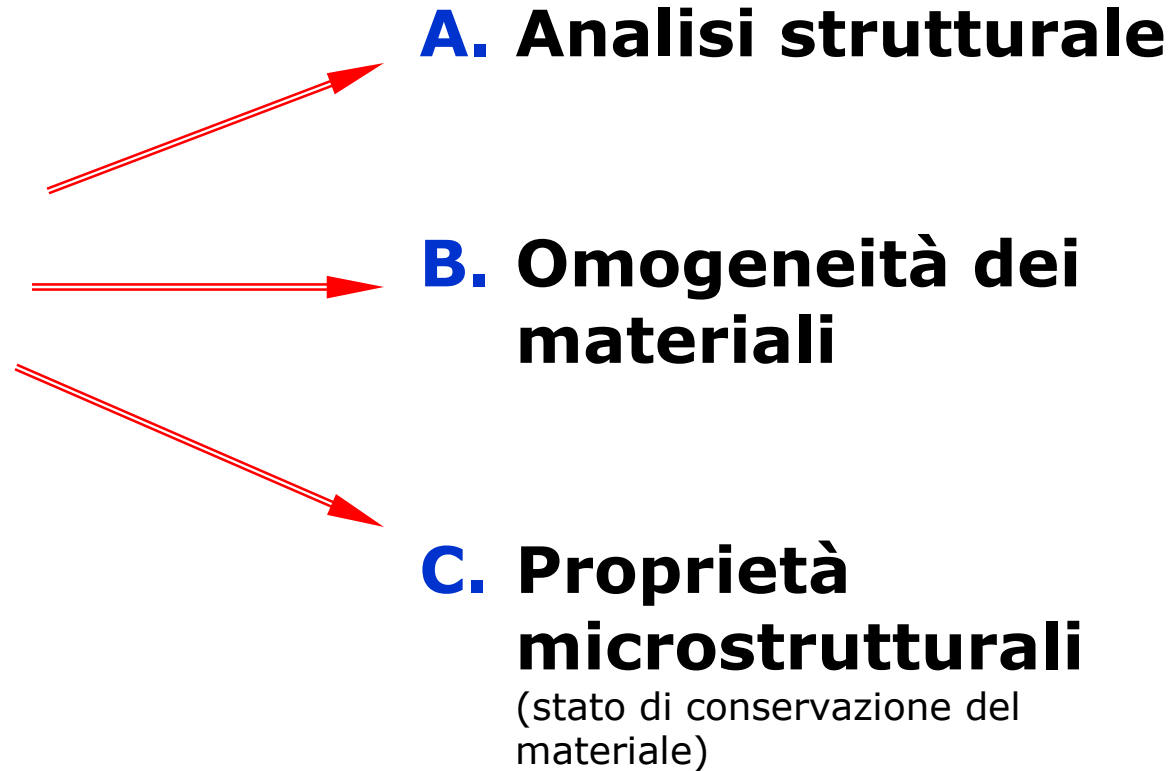
vista laterale



vista laterale



termografia



Esempi

- *Monili fenicio-punici*
- *Manufatti bronzei (Marc'Aurelio)*
- *Monete romane*
- *Anfore romane*
- *Libri antichi*

1. Analisi della struttura (del manufatto)

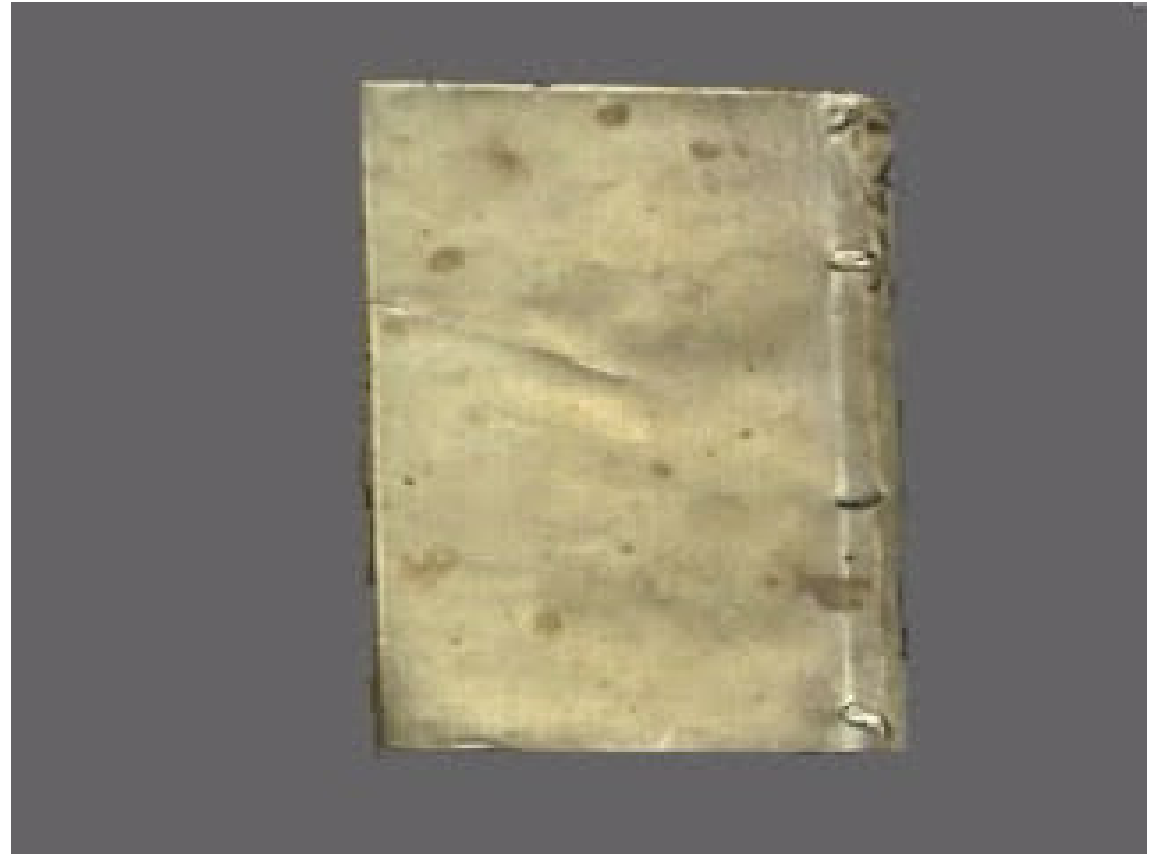
film



1. stratigrafica della
struttura nascosta

NOTA:

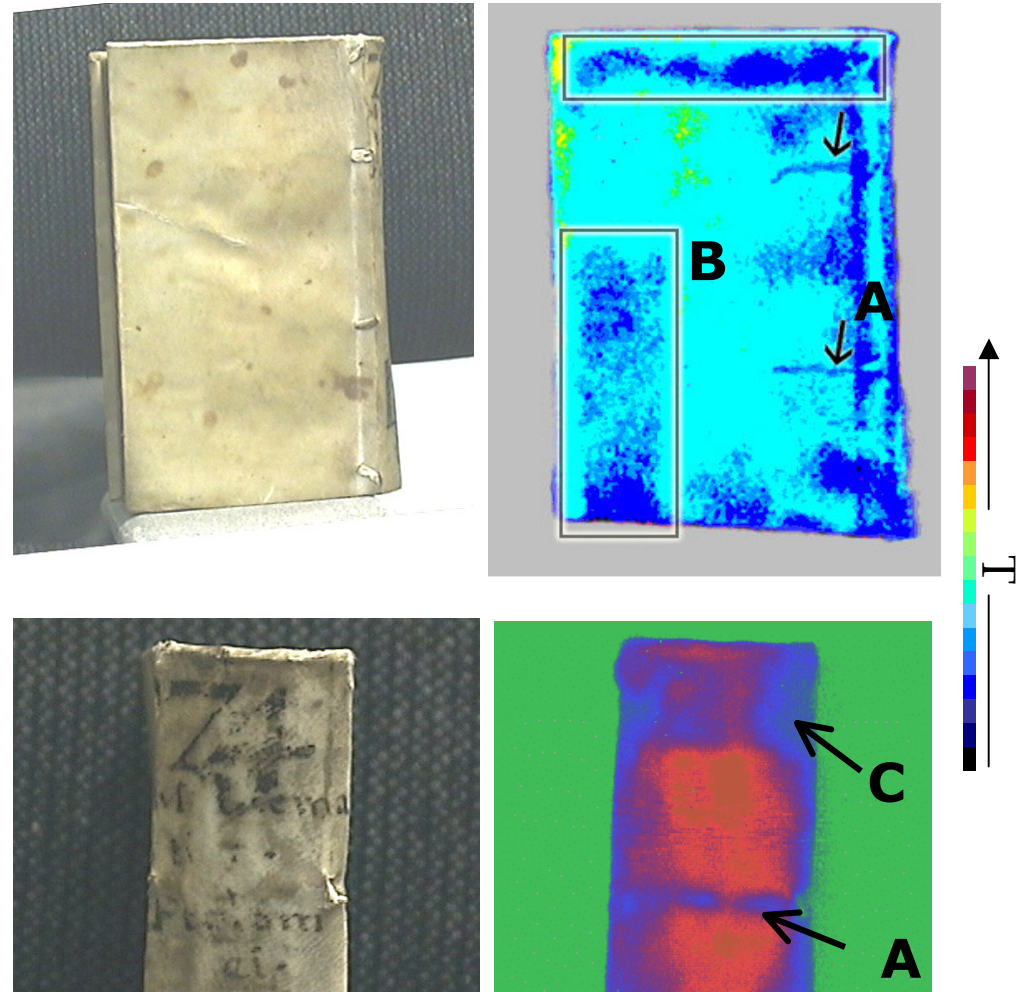
ritardo = profondità



XVIII century volume. Legatura in pergamena floscia

Analisi della struttura

- A.** Sviluppo dei nervi
- B.** Adesione del rimbocco
- C.** Estensione della cuffia

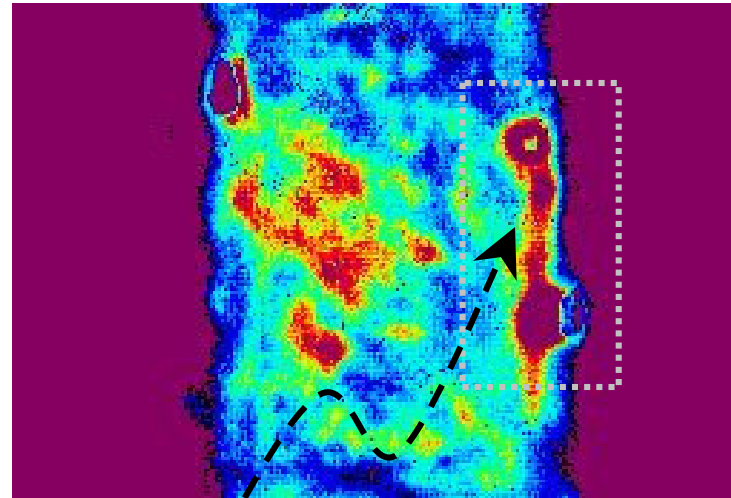


•C.Nipote, *Vitae excellentium imperatorum*, (1600-1700)

Coperta in pergamena: danni da infestanti



Fori d'uscita

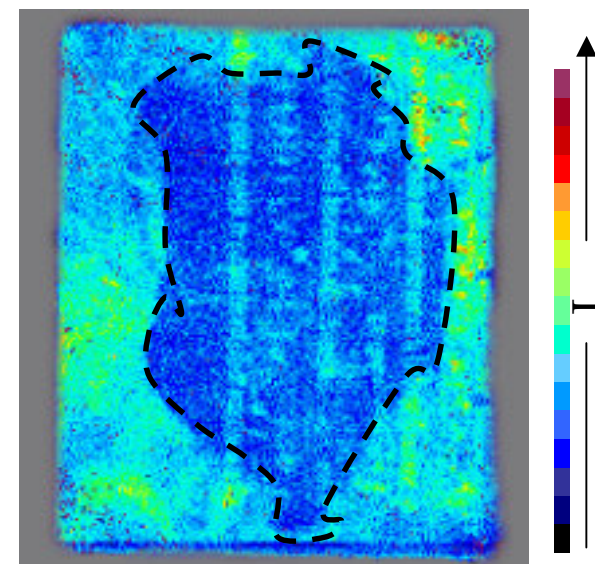


Vuoto di collegamento

XVIII century volume. Coperta: fogli manoscritti di riuso su piatto in cartone

Coperta in carta e cartone

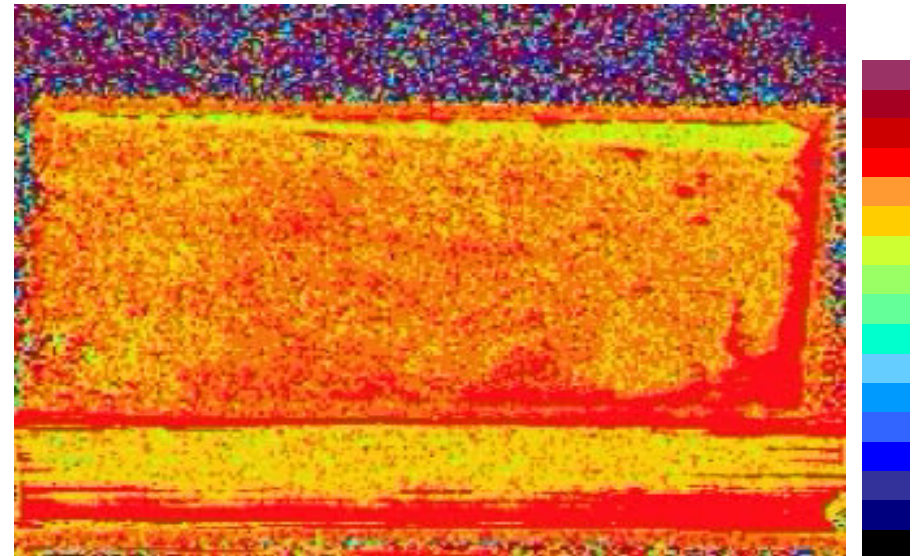
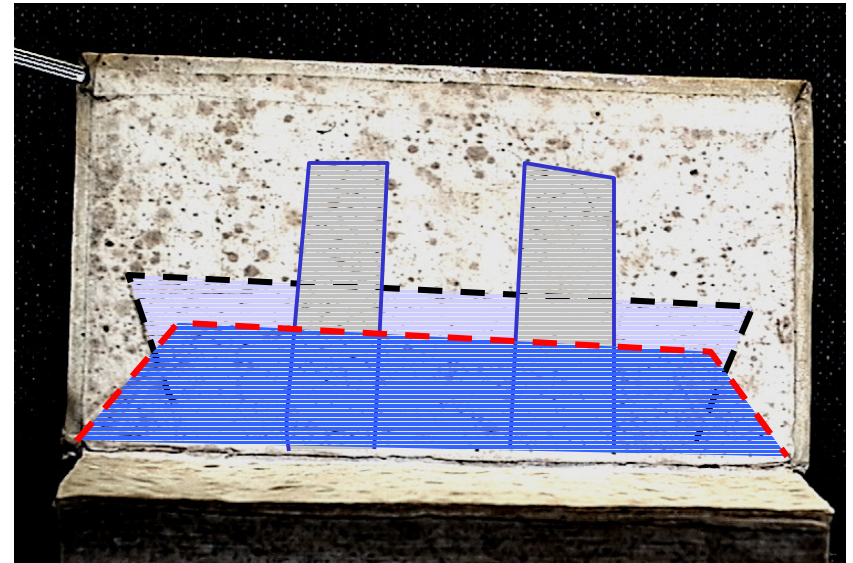
- **disomogeneità
d'adesione tra fogli
manoscritti di riuso
utilizzati per la coperta
e piatto di cartone**



•G.Buchan, *Medicina domestica*, Napoli 1781
Legatura in pergamena rigida

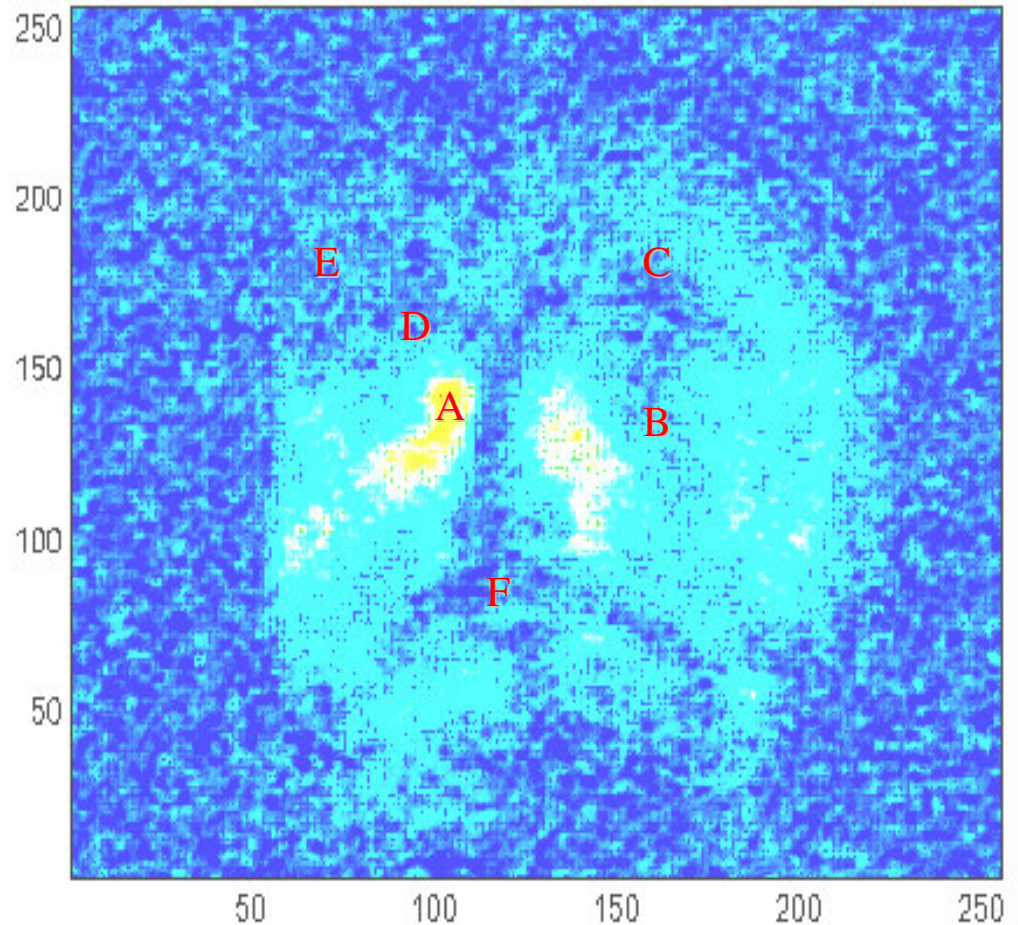
Contropiatto

A. Adesione della controguardia al cartone

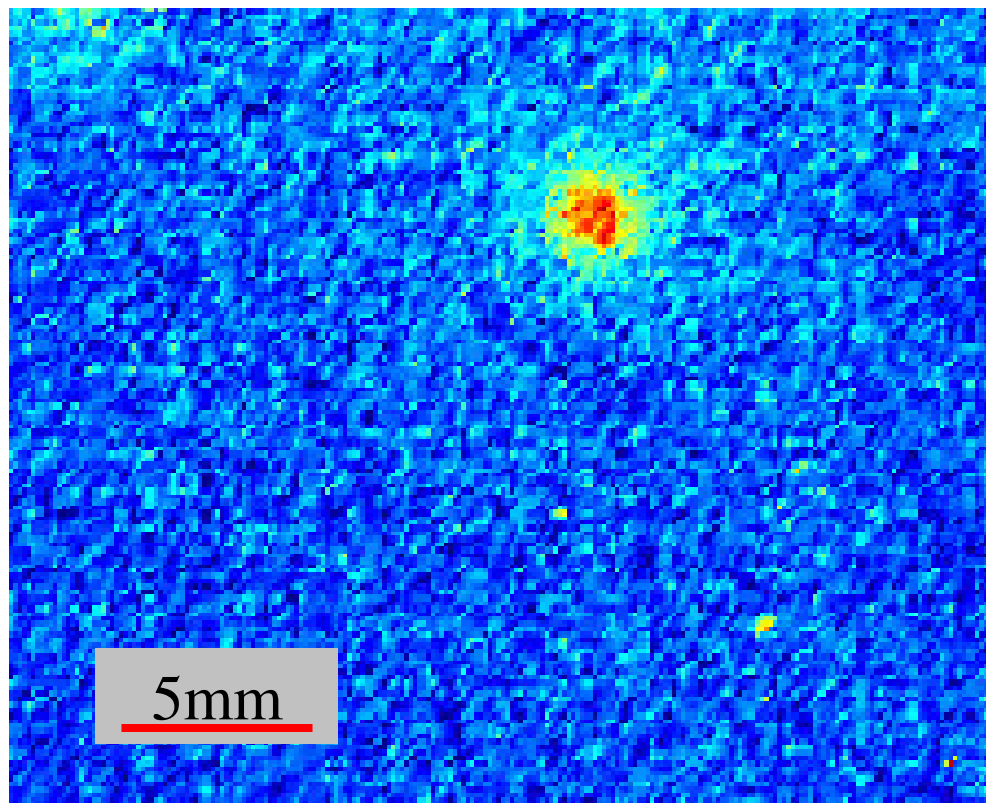


Copia del Marc'Aurelio: spessimetria del volto

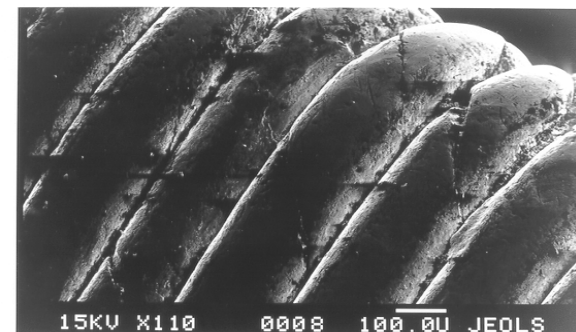
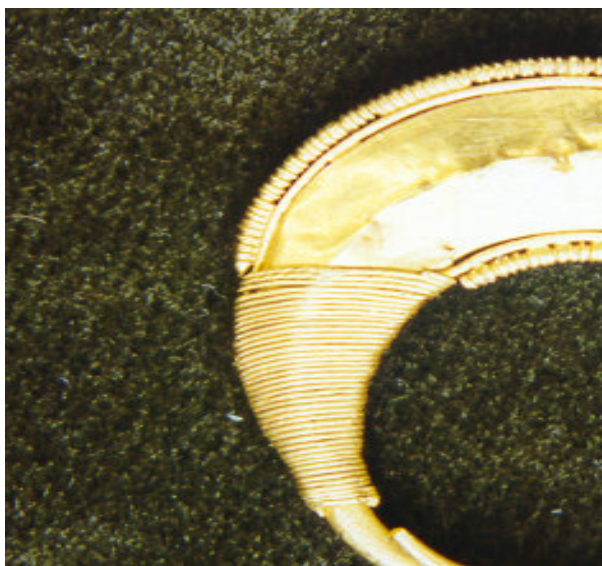
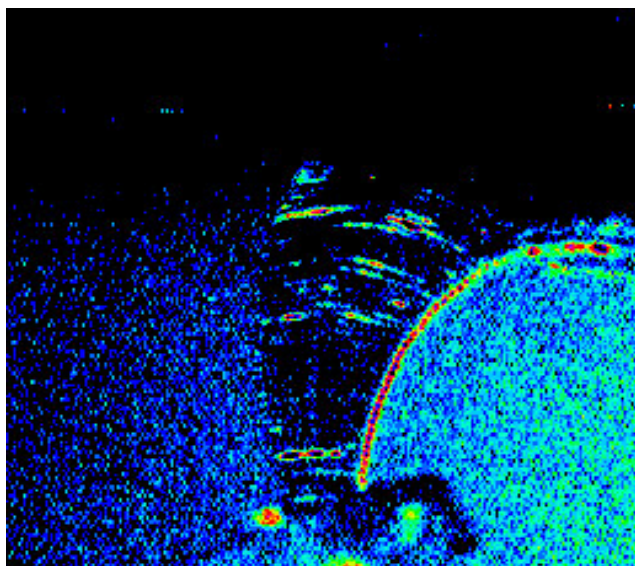
PARTE ANALIZZATA	Spessore (mm)	
Tra naso e occhi	4.8	A
Sotto gli occhi	6.0	B
Sulla tempia	6.2	C
Sull'occhio	6.3	D
Zone laterali della fronte	7.1	E
Sotto le narici	9.2	F



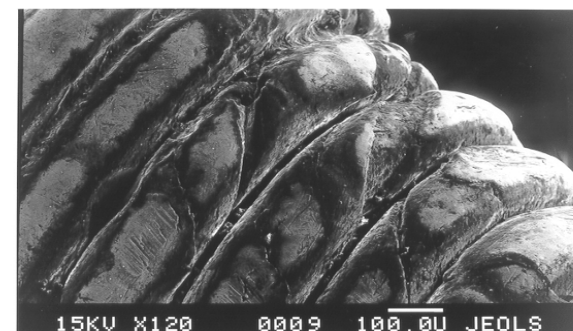
Copia del Marc'Aurelio: bolla di fusione



Oreficeria fenicio-punica: orecchino

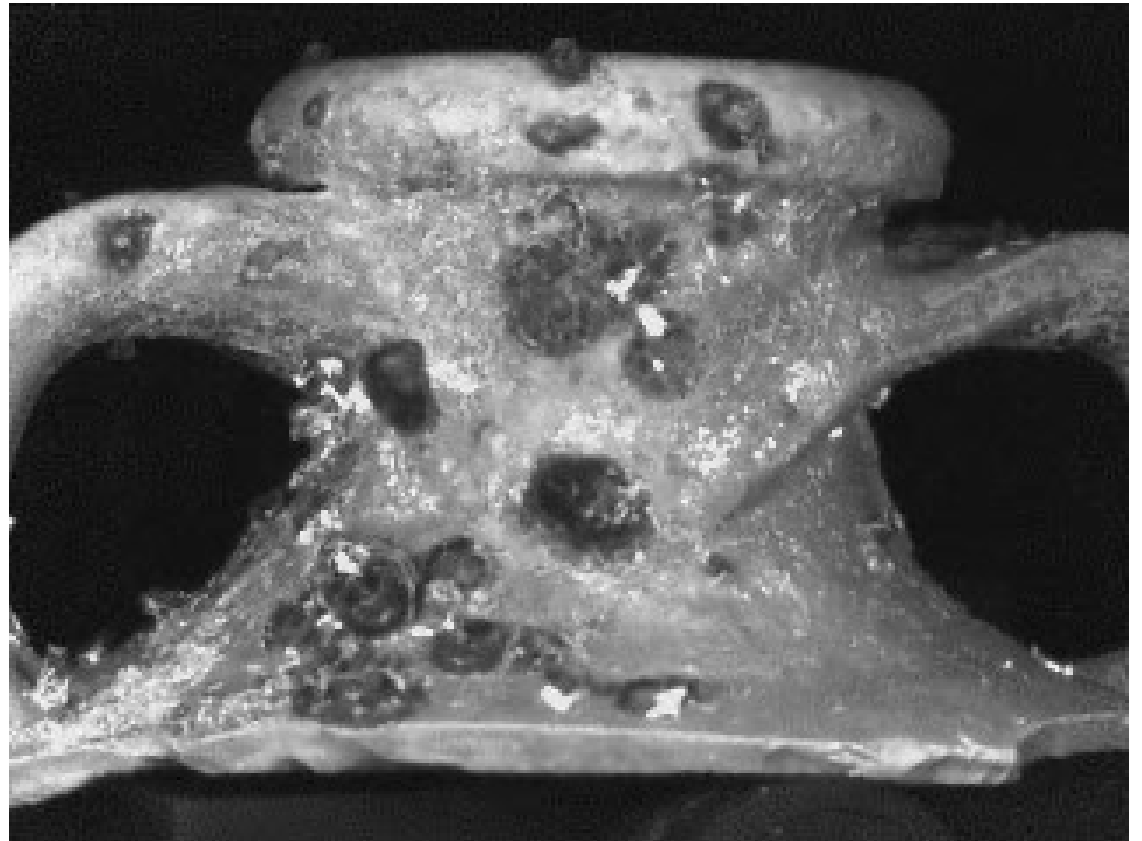
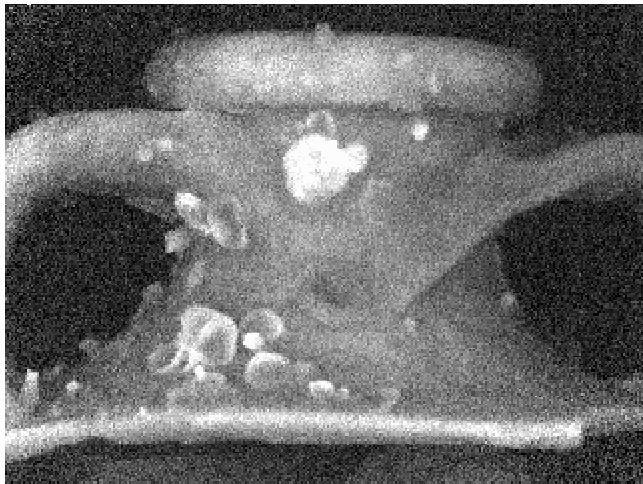
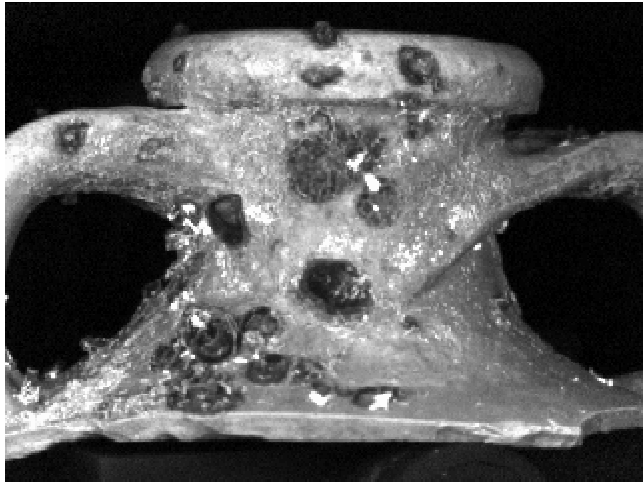


Filo con segni di attorcigliamento



Filo con segni di attorcigliamento

Anfora romana: concrezioni



3. Analisi delle disomogeneità

film



2. Film = analisi
dell'estensione del
danno

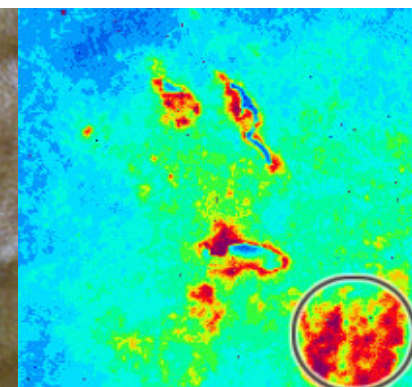
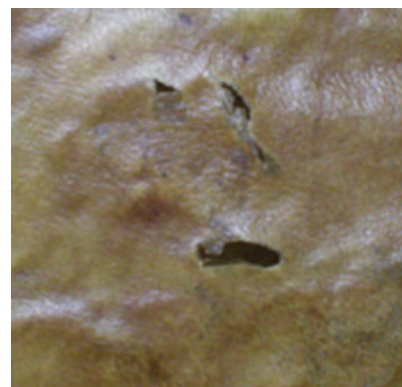
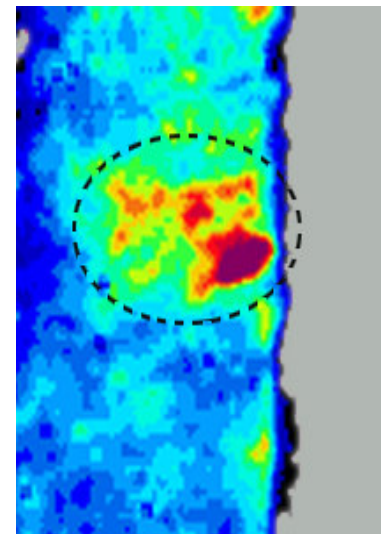


raffreddamento più lento = materiale sfibrato (area danneggiata)

•XVIII century volume. Coperte membranacee

Rivelazione di disomogeneità

A. Aree danneggiate

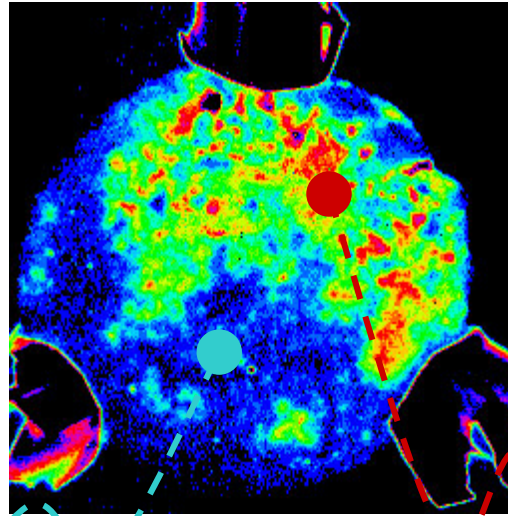


Monete romane: disomogeneità del materiale di fusione

fotogramma



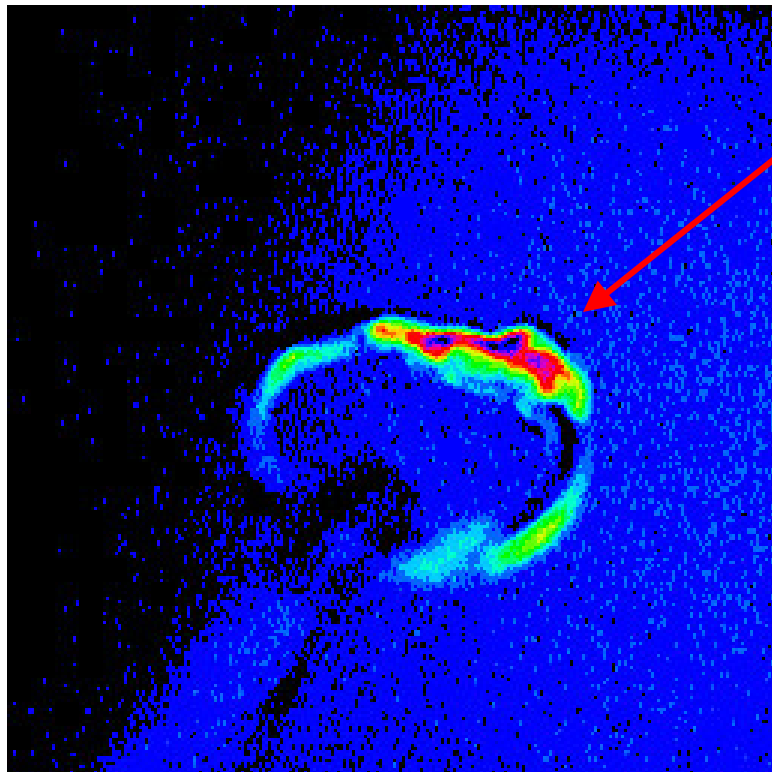
termogramma



raffreddamento rapido

raffreddamento lento (materiale diverso, più poroso)

Oreficeria punica: anello



Saldatura del castone

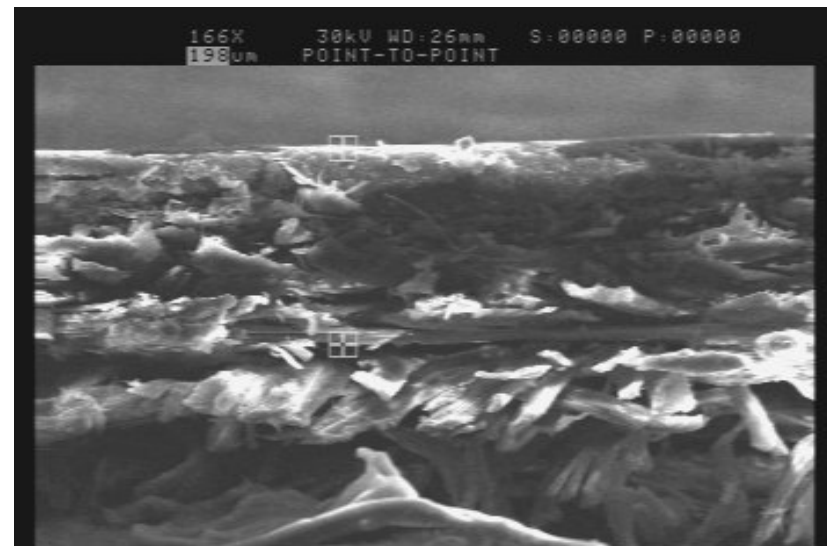
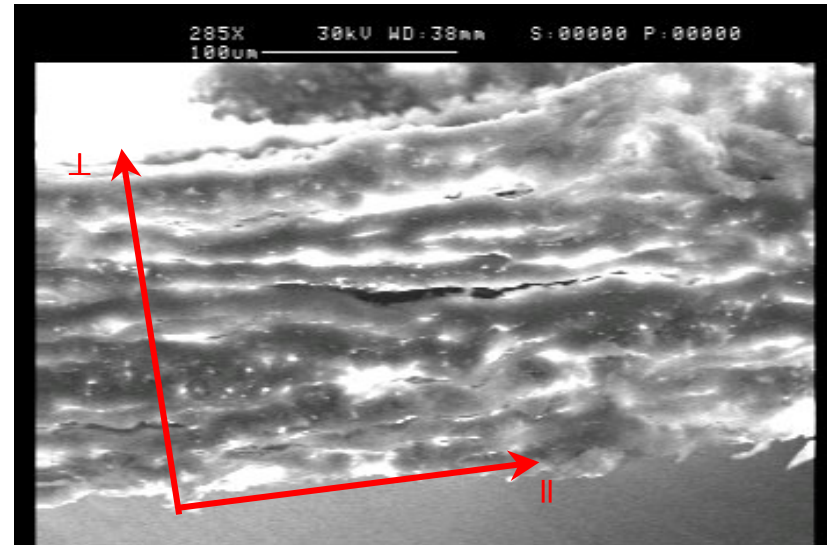
- localizzazione materiale di saldatura



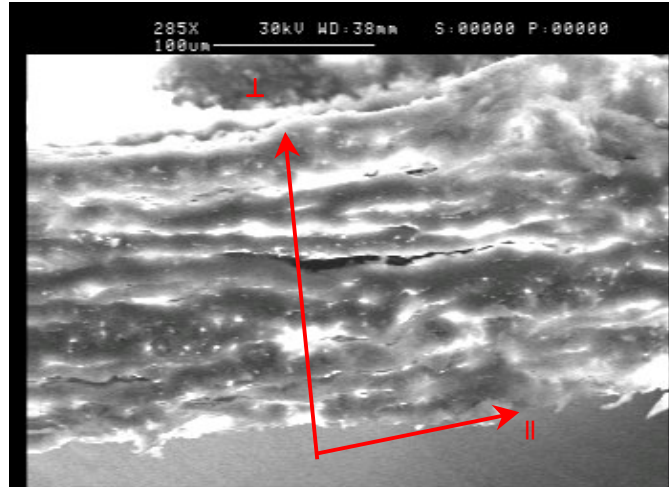
corpo: Cu
esterno: Au 90%, Ag10%
saldatura: Ag

3. Analisi della **micro**struttura (dei materiali) (propagazione del calore)

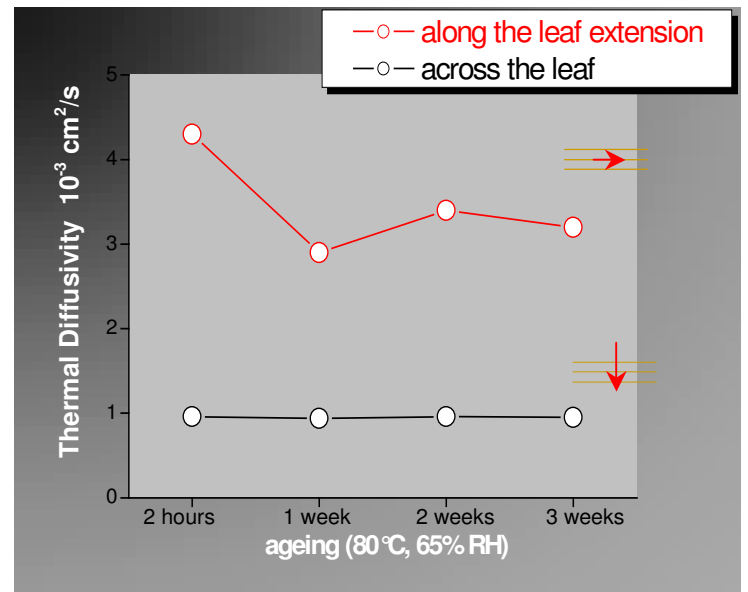
*Struttura fibrosa e
propagazione del
calore*



**anisotropia
strutturale e
termica**



**anisotropia e
degrado**



termogramma =
mappa estesa del danno
(linee di frattura)

