

Università degli Studi di Padova – Dipartimento di Ingegneria Industriale

Corso di Laurea in Ingegneria Chimica e dei Materiali

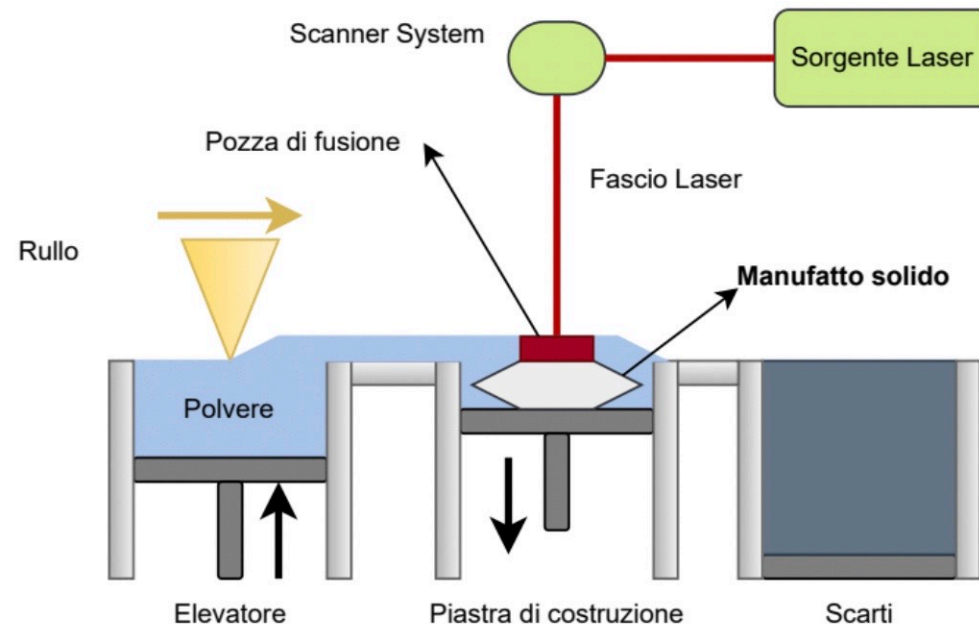
Relazione per la prova finale
«Caratterizzazione di manufatti bimetallici
realizzati mediante tecnica additiva «Selective Laser
Melting»»

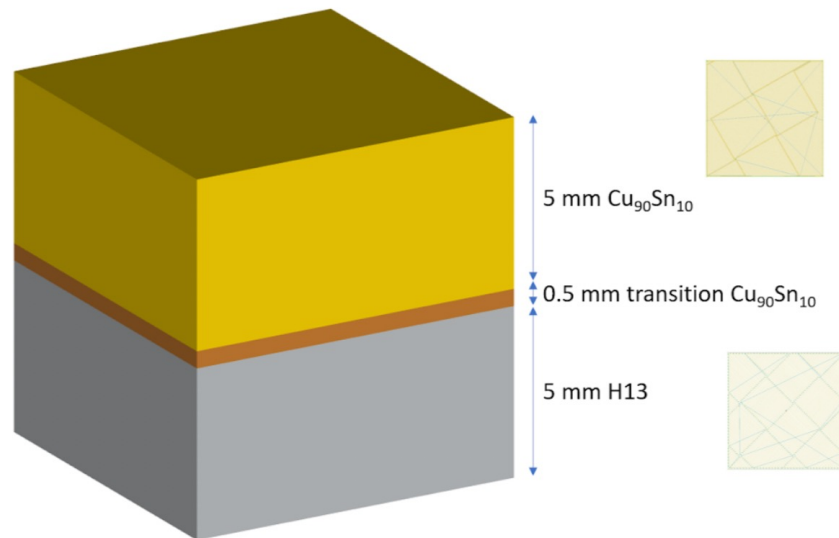
Tutor universitario: Prof. Irene Calliari

Laureando: *Silvia Migazzi*

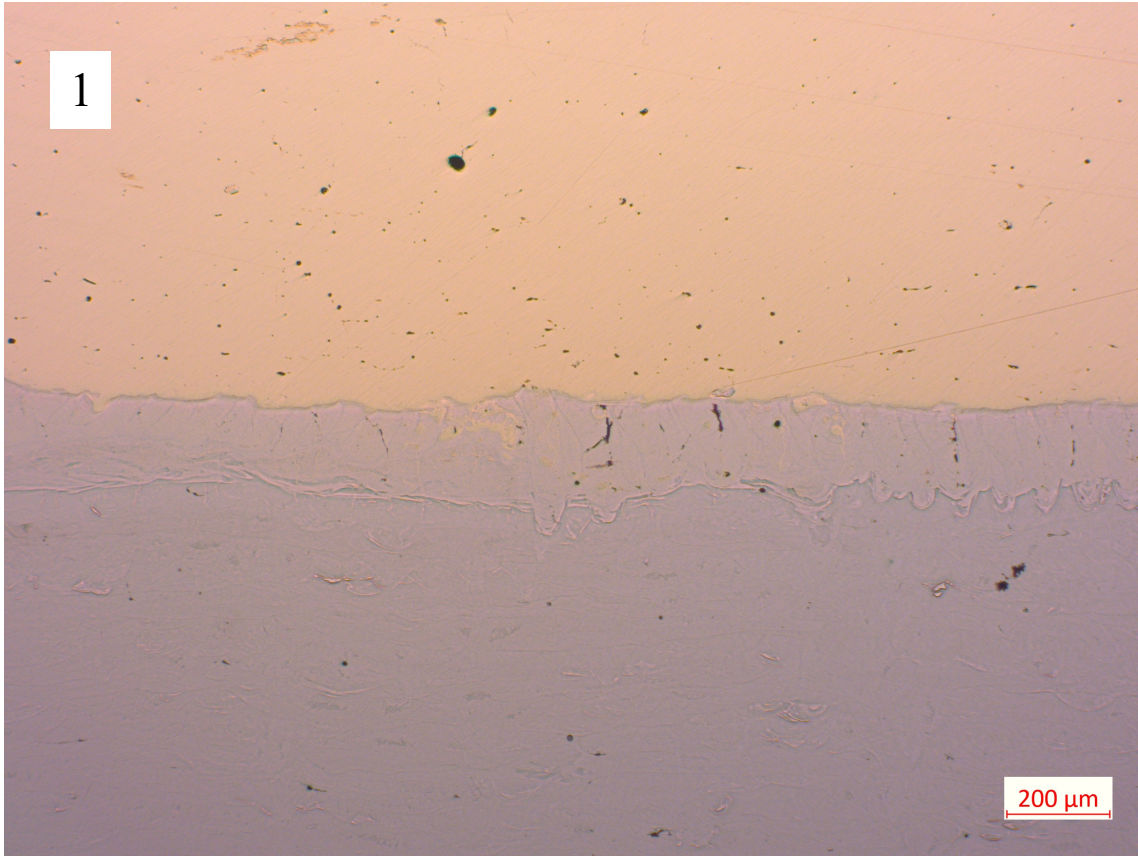
Padova, 9/11/2022

- SLM fa parte dei processi di *produzione additiva*, fondati sulla realizzazione di componenti tridimensionali attraverso la deposizione di materiale «strato per strato», partendo da un file CAD 3D;
- Sfrutta una sorgente laser ad alta densità di potenza per fondere ed unire polveri metalliche distribuite su un «letto di polvere»;

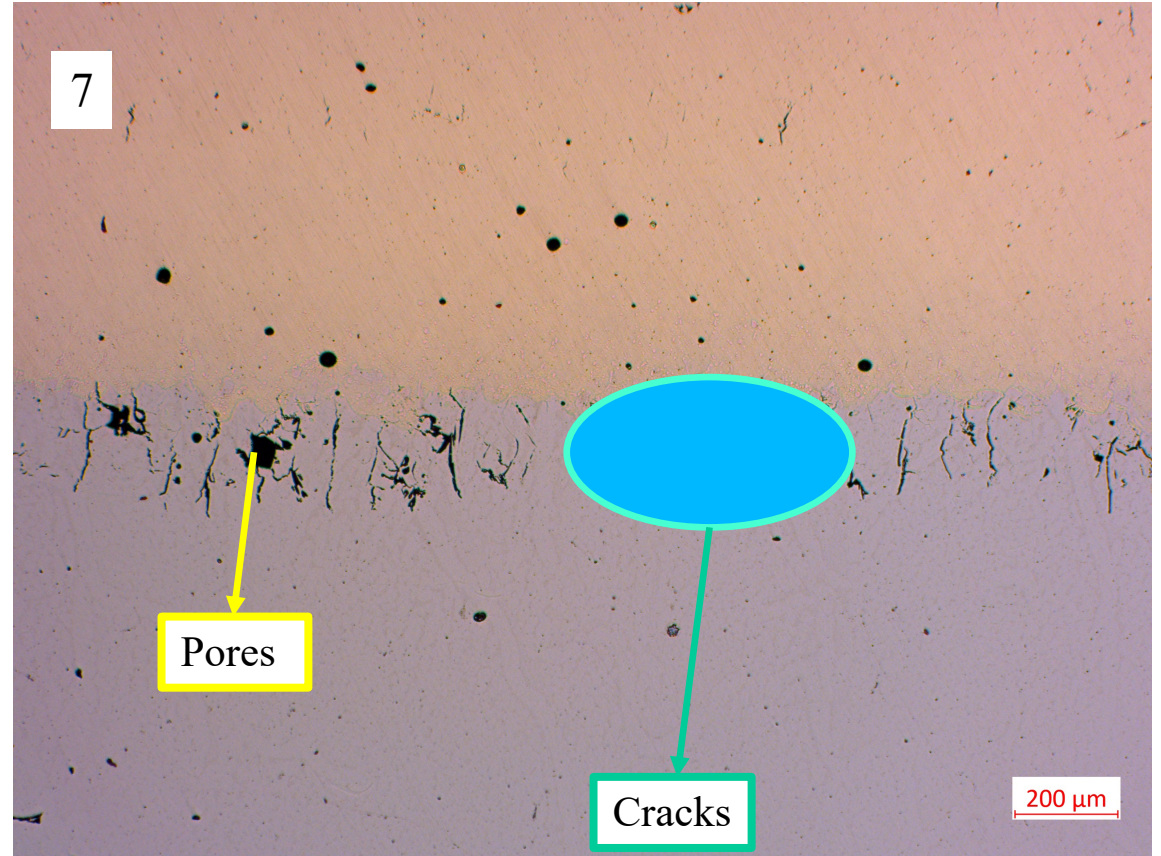




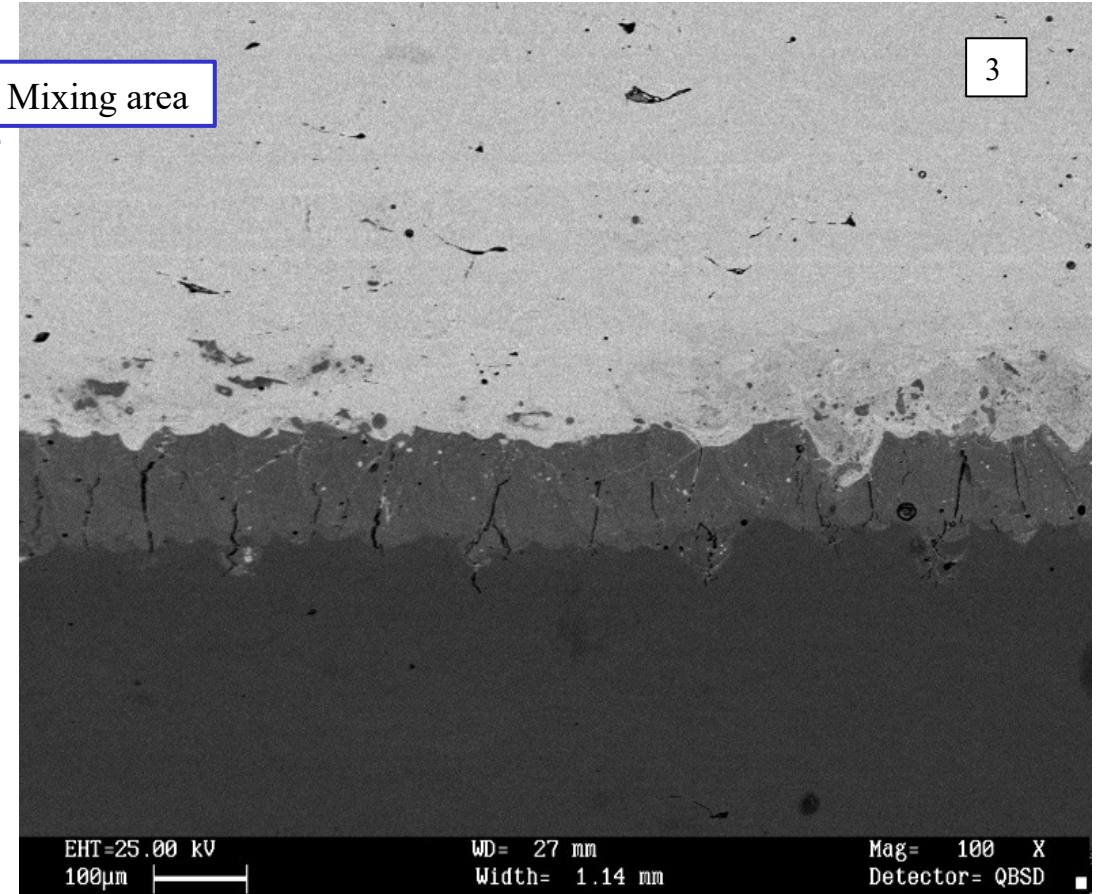
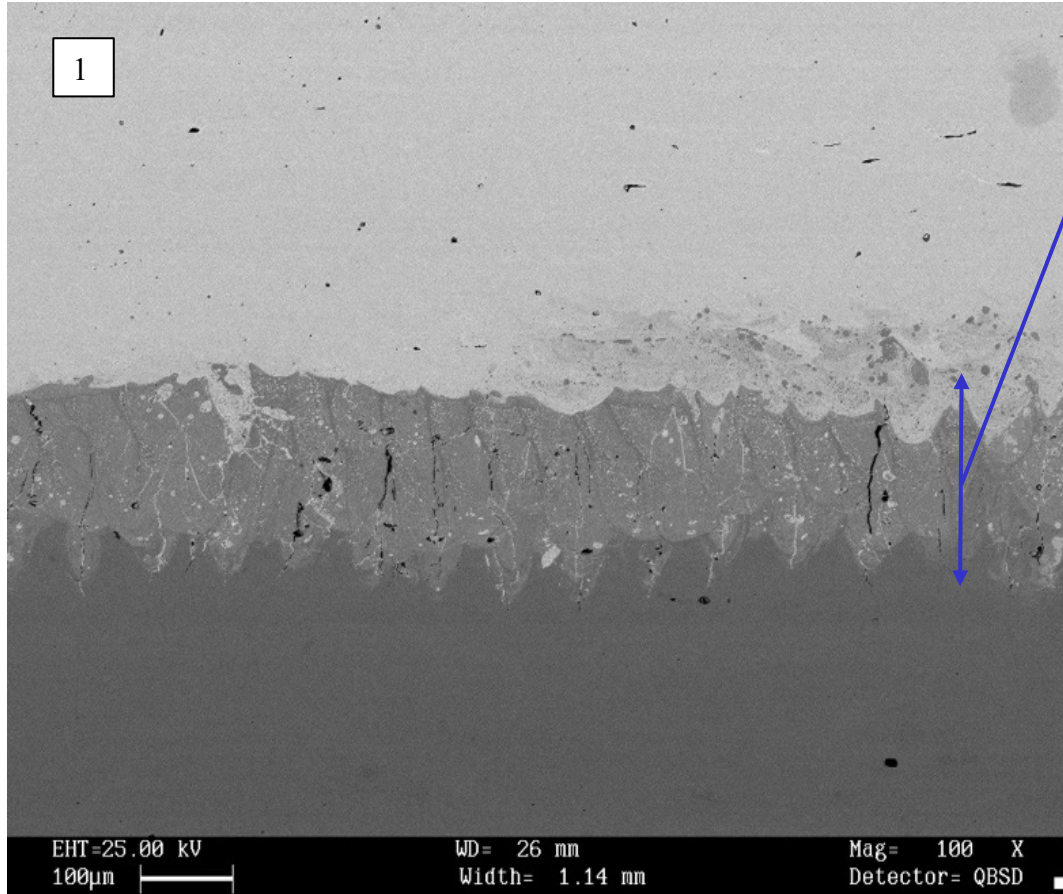
Sample	Laser Power [W]	Scanning Speed (mm/s)
1	120	700
2	120	800
3	120	900
4	130	700
5	130	800
6	130	900
7	140	700
8	140	800
9	140	900
10r	130	800



120W | **700mm/s**



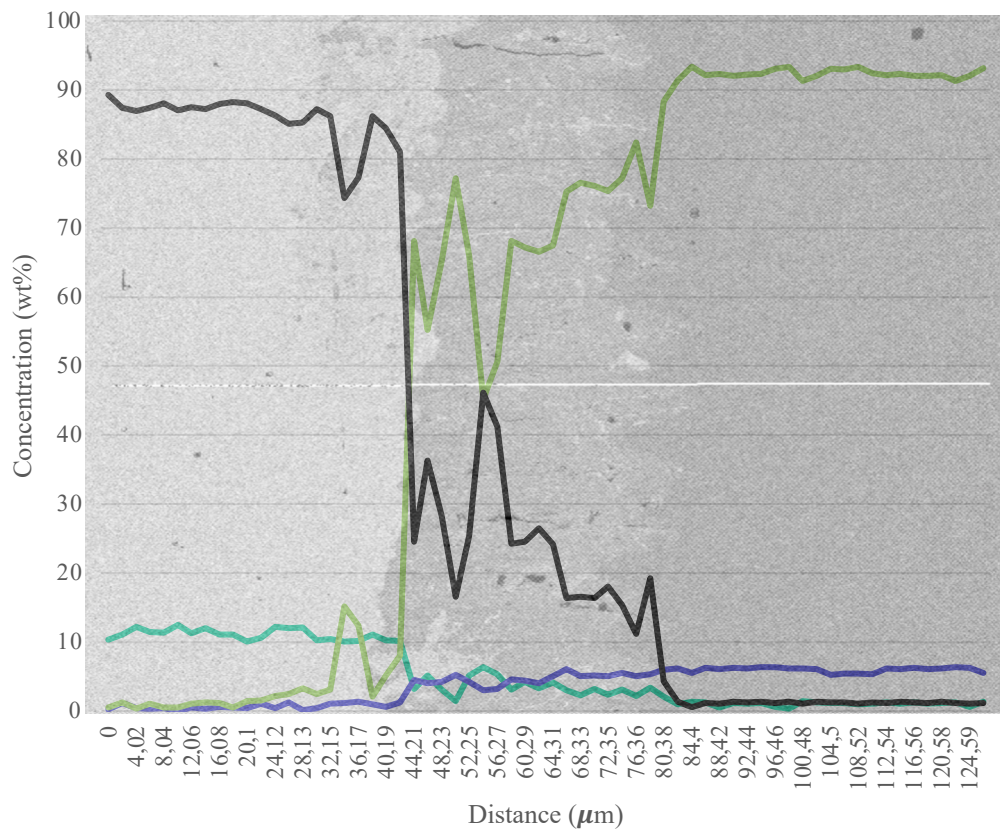
140W | **700mm/s**



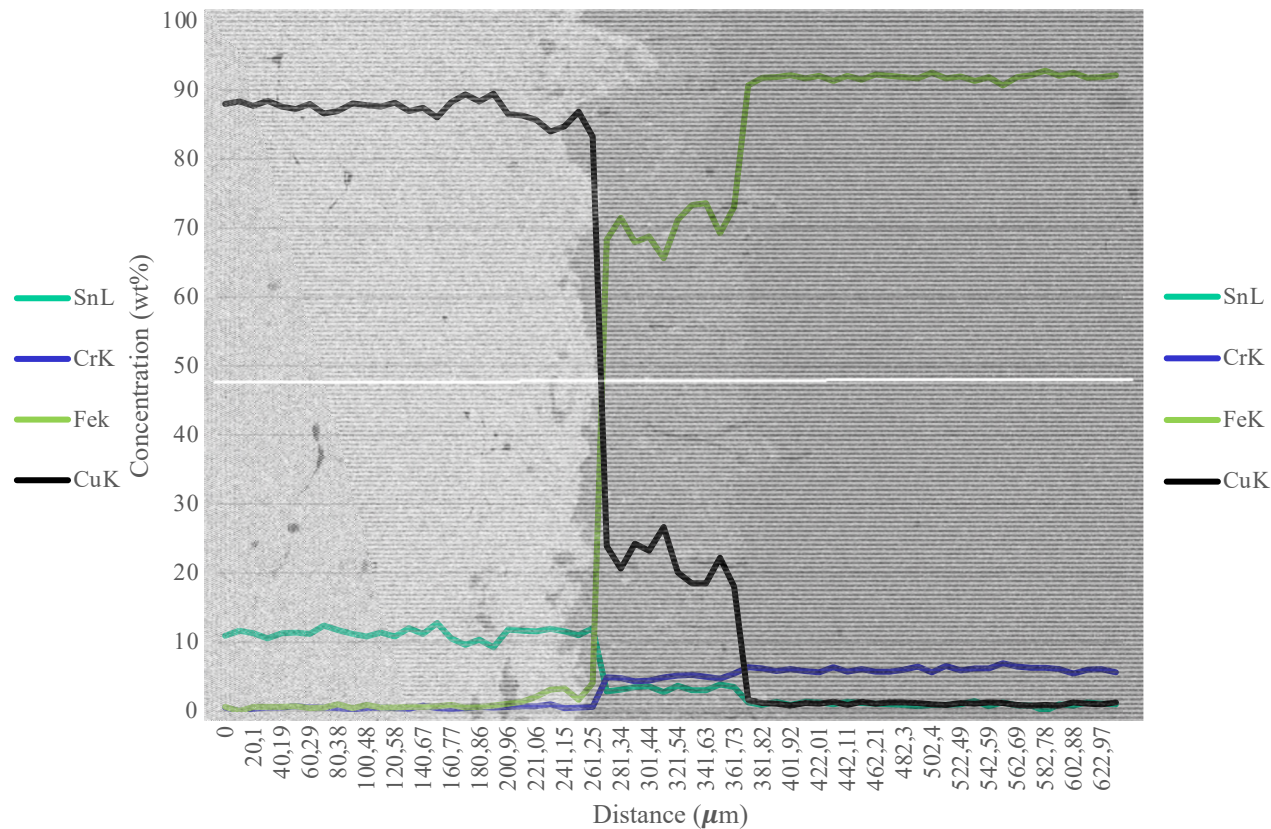
120W | **700mm/s**

120W | **900mm/s**

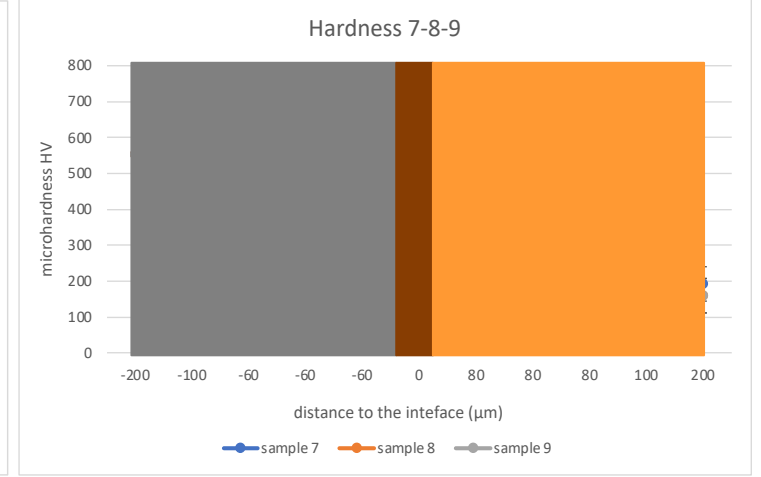
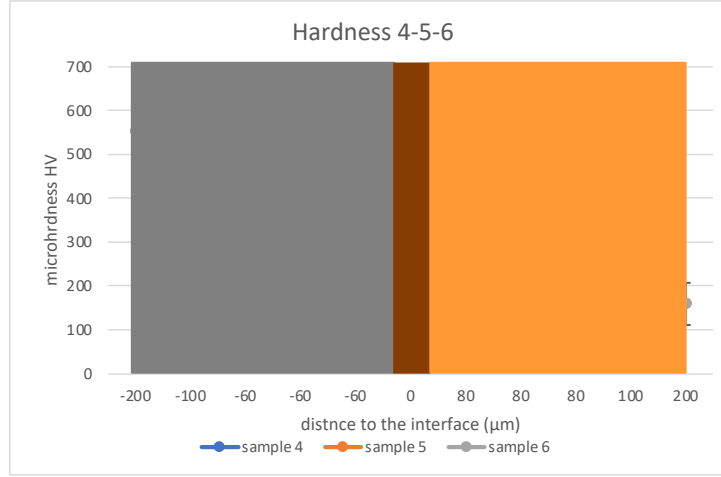
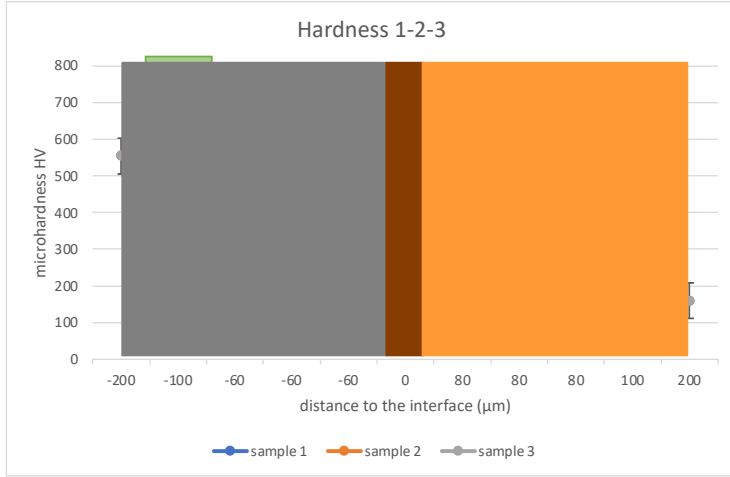
Line Scan Sample 1



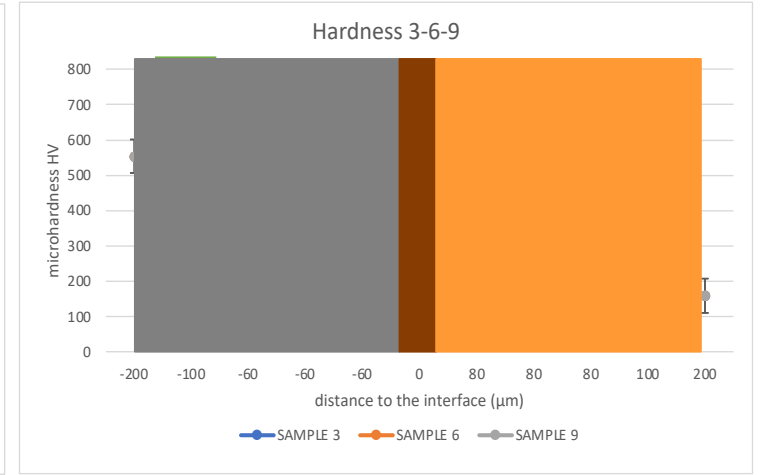
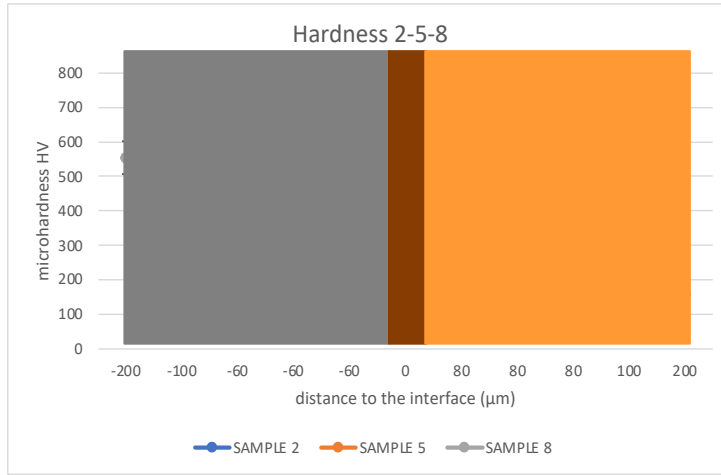
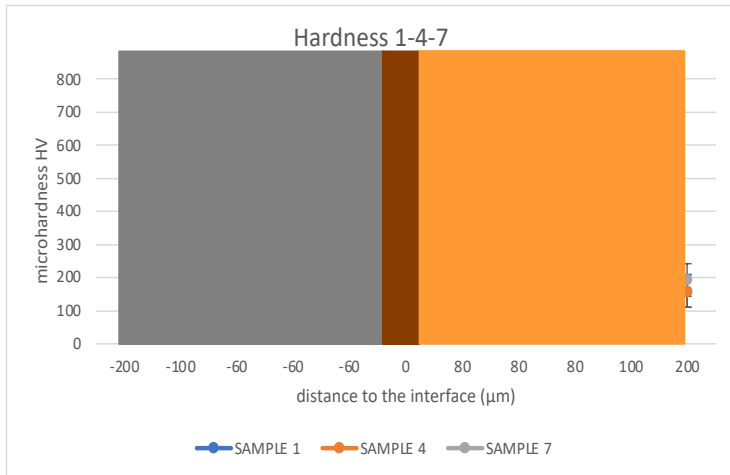
Line Scan Sample 3



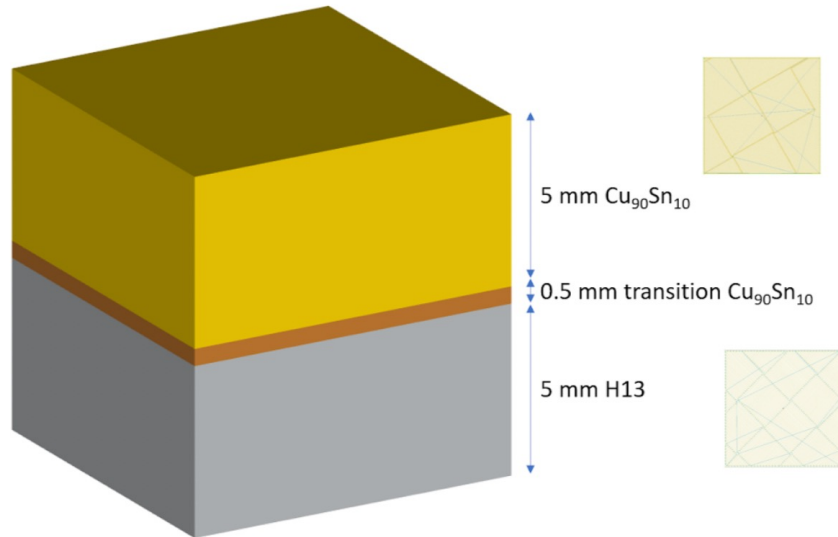
Potenza:



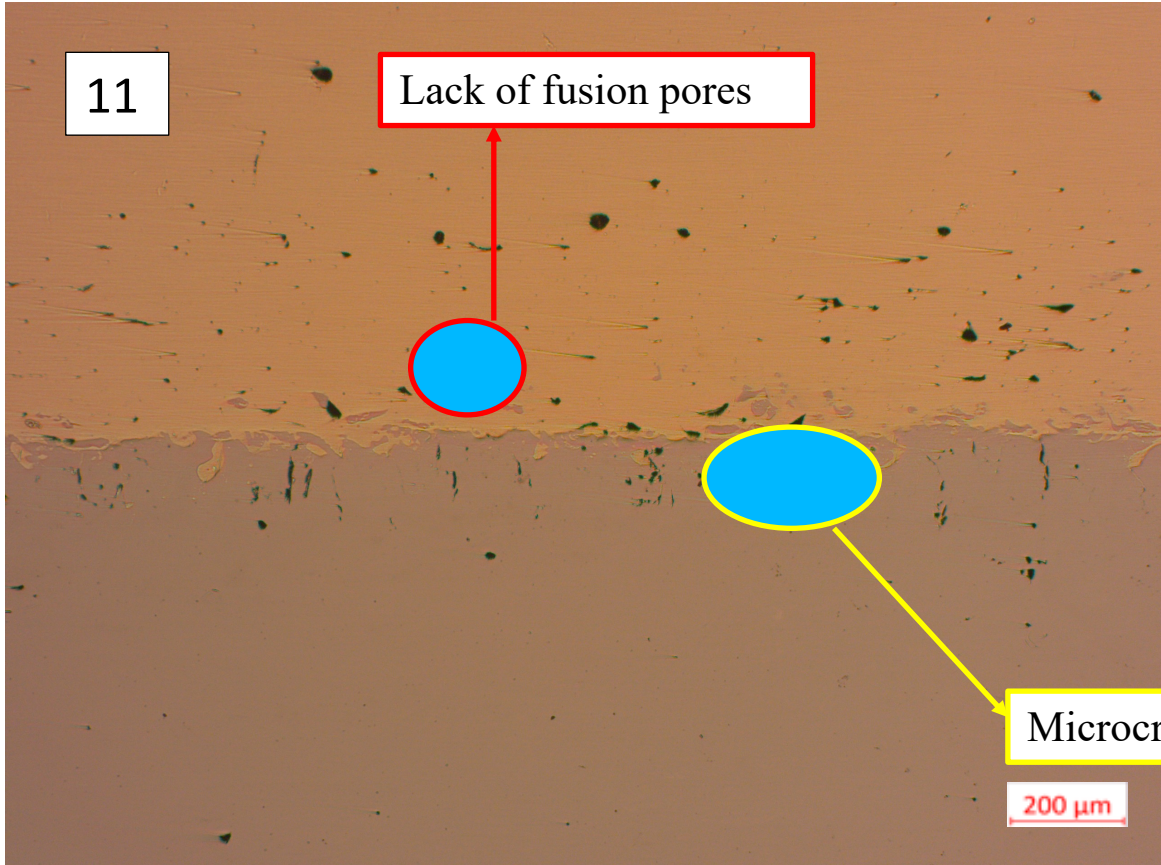
Velocità:



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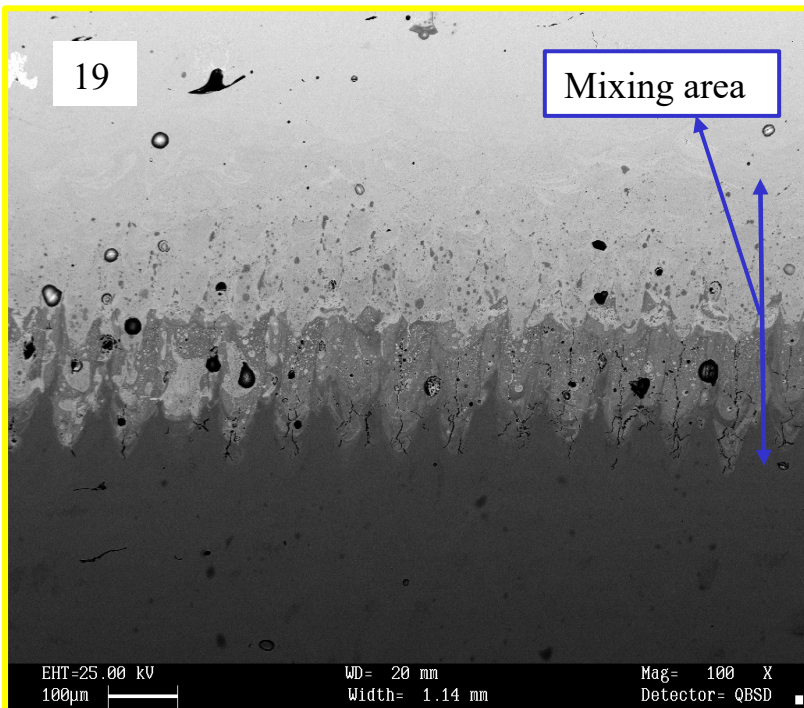
Sample	Laser Power [W]	Scanning Speed [mm/s]
11	90	700
12	90	800
13	90	900
14	100	700
15	100	800
16	100	900
17	110	700
18	110	800
19	110	900



90W **700mm/s**

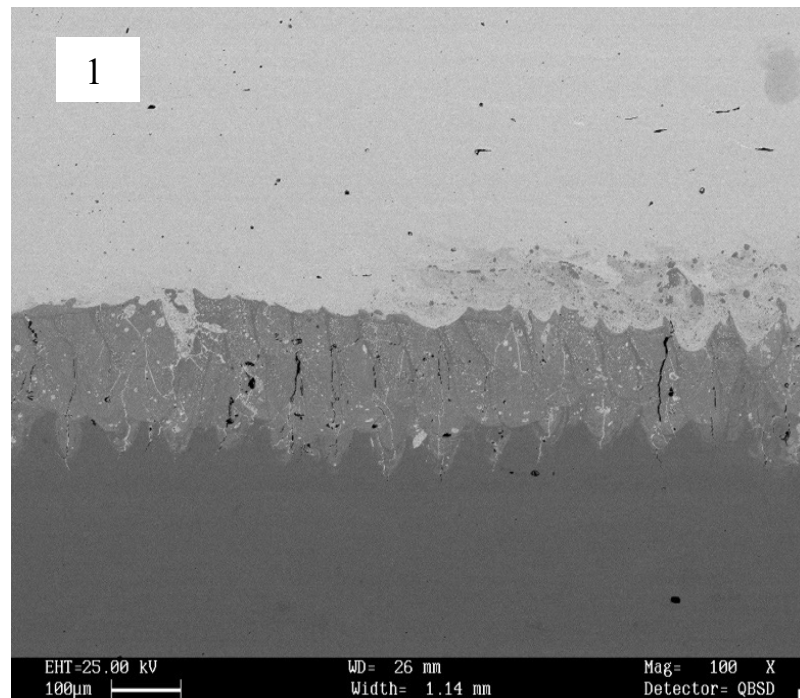


110W **700mm/s**

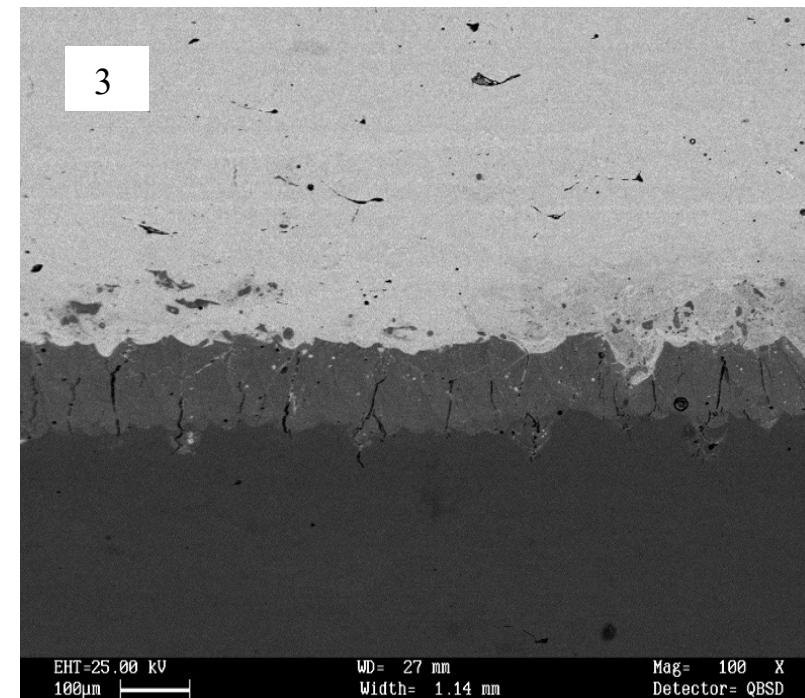


100W **900mm/s**

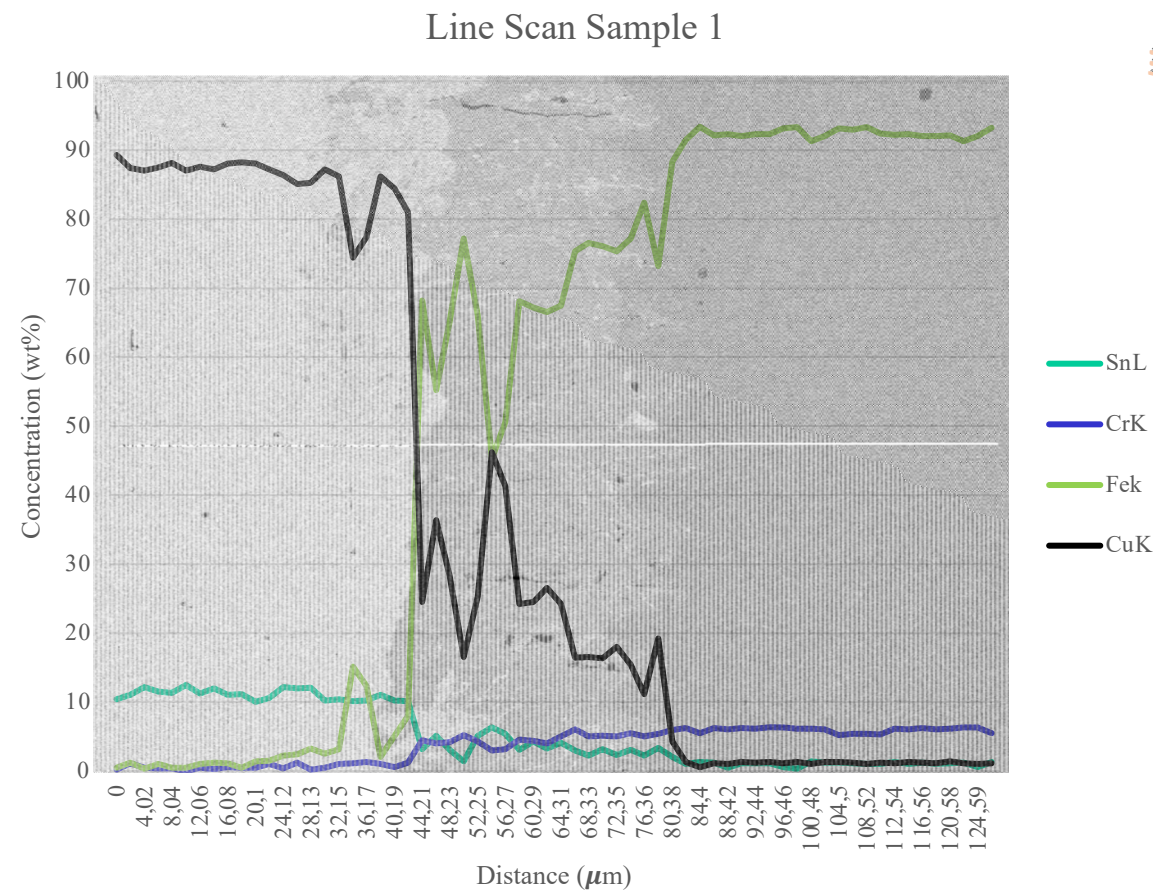
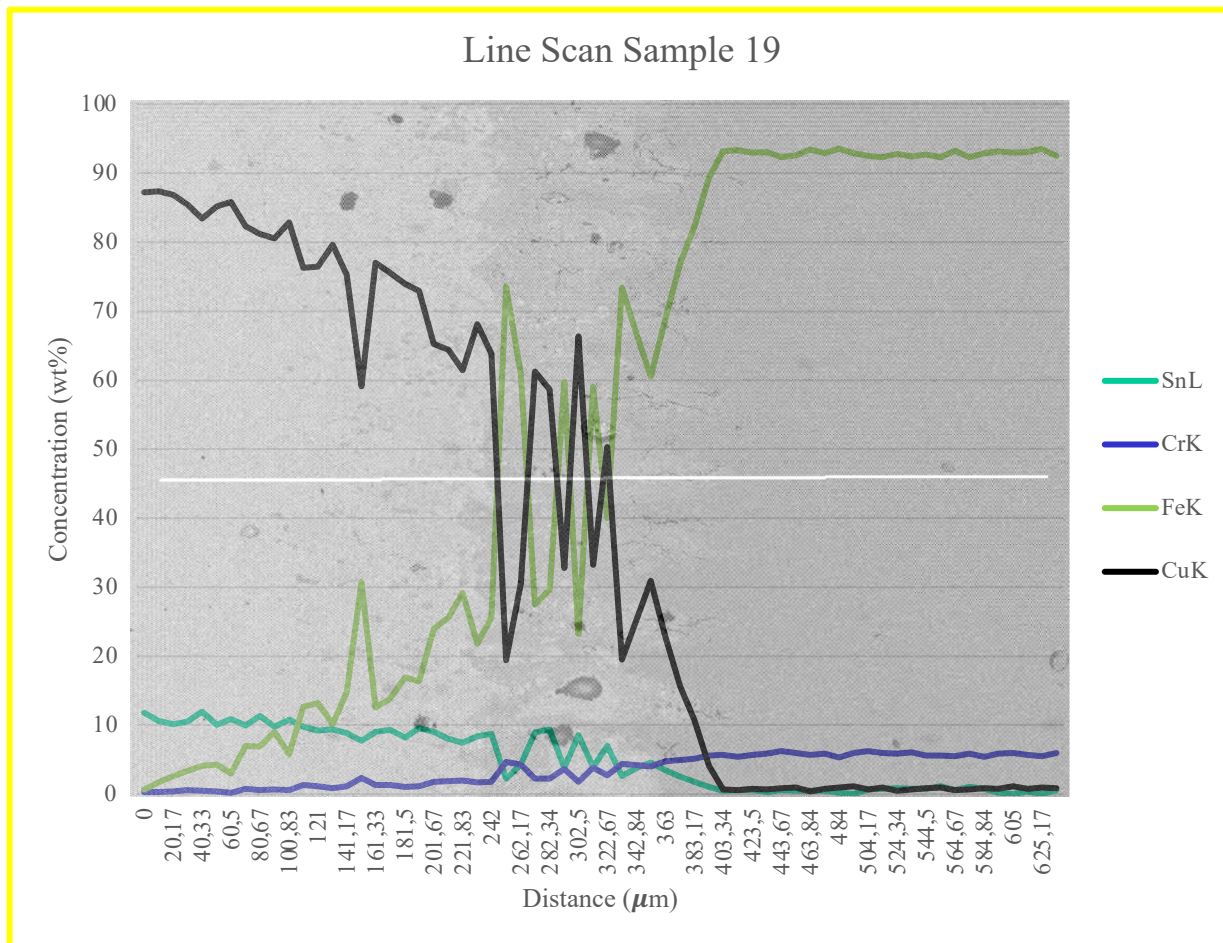
Remelting

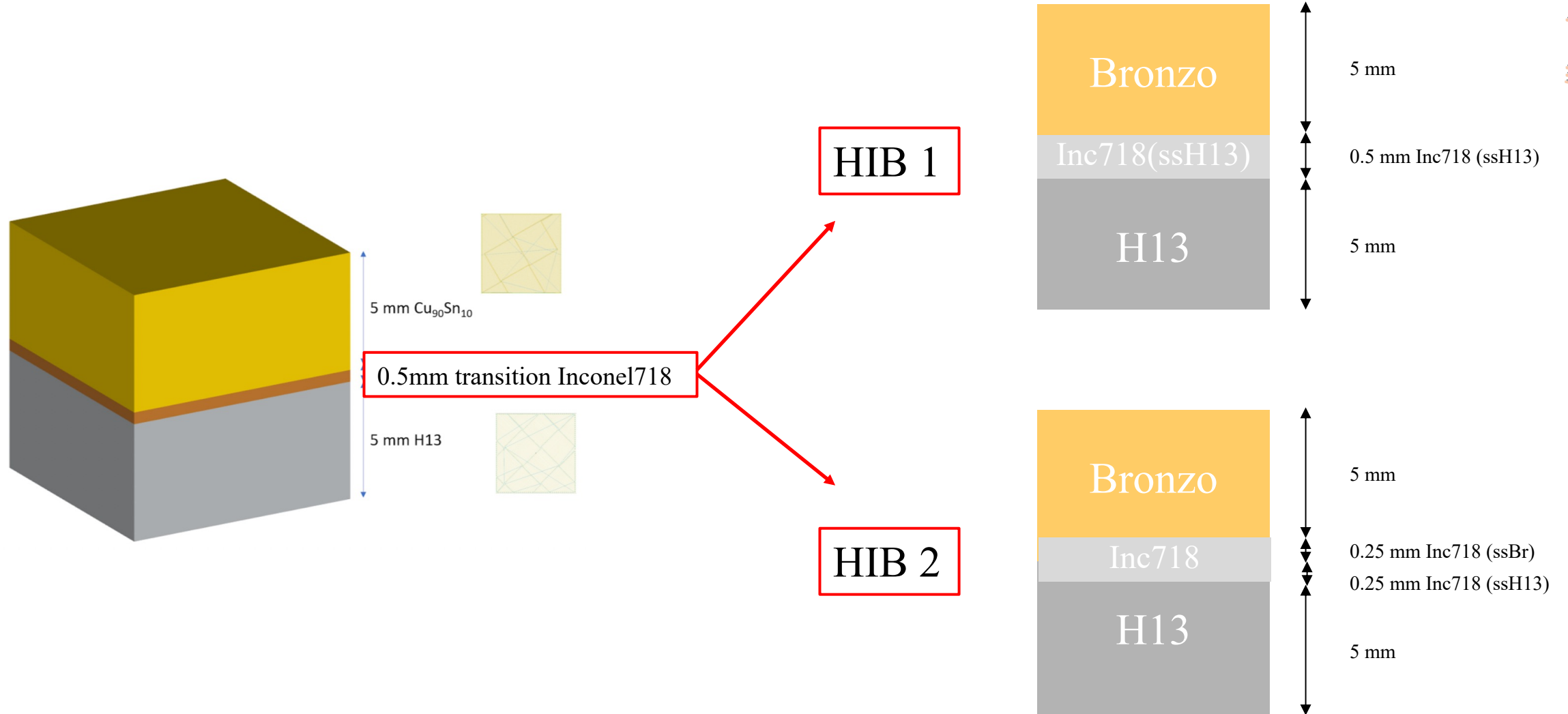


110W **700mm/s**



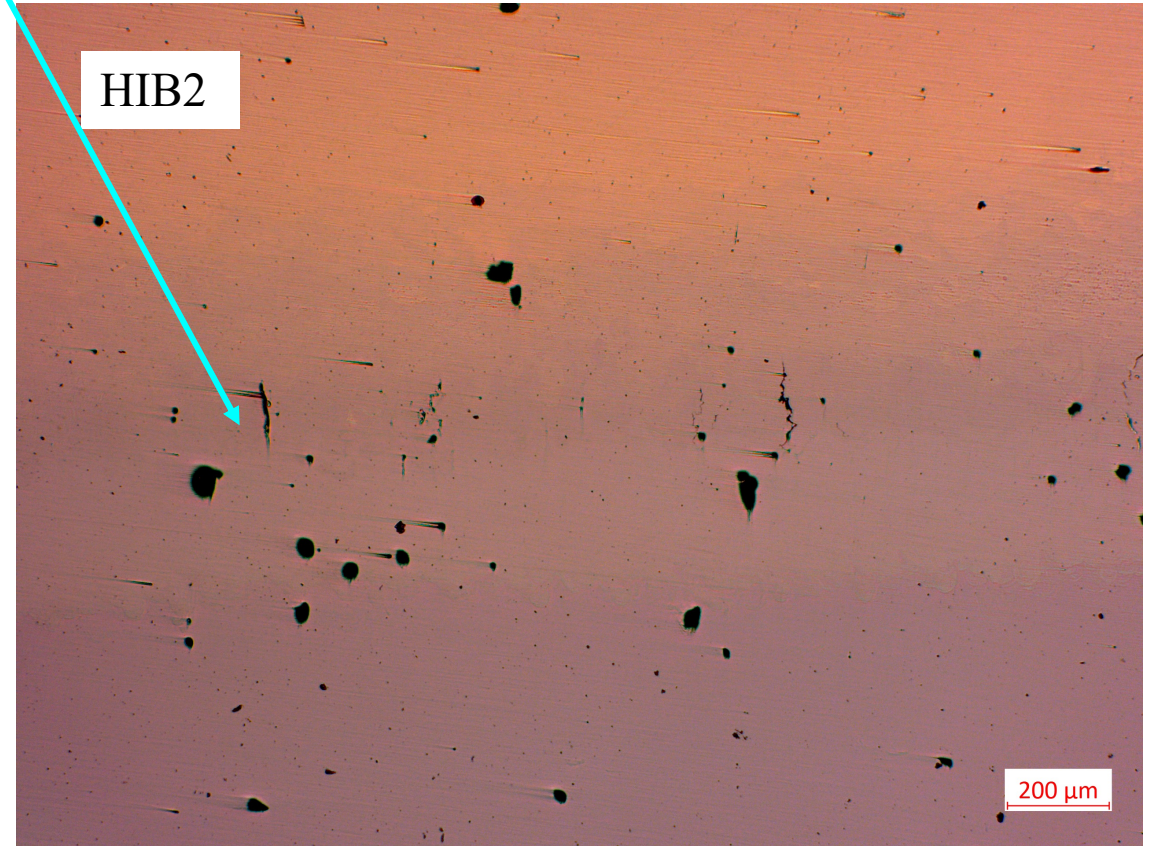
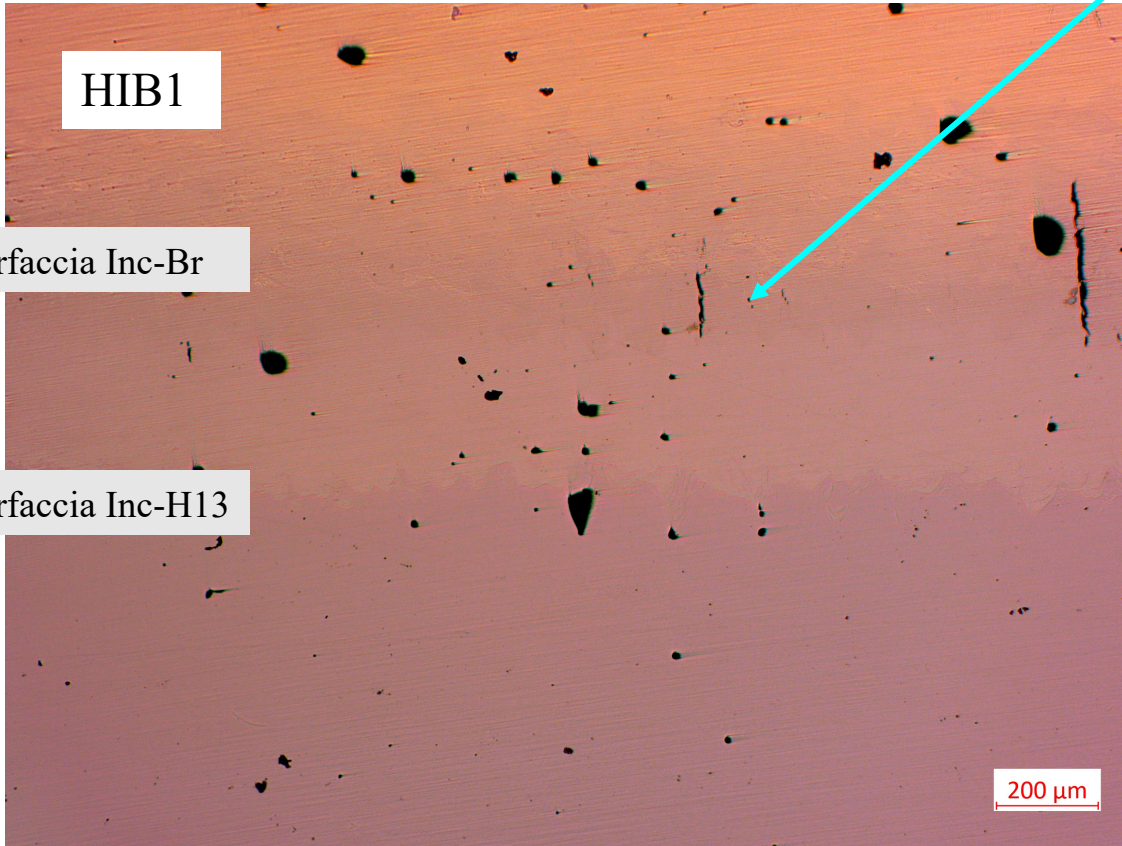
110W **900mm/s**

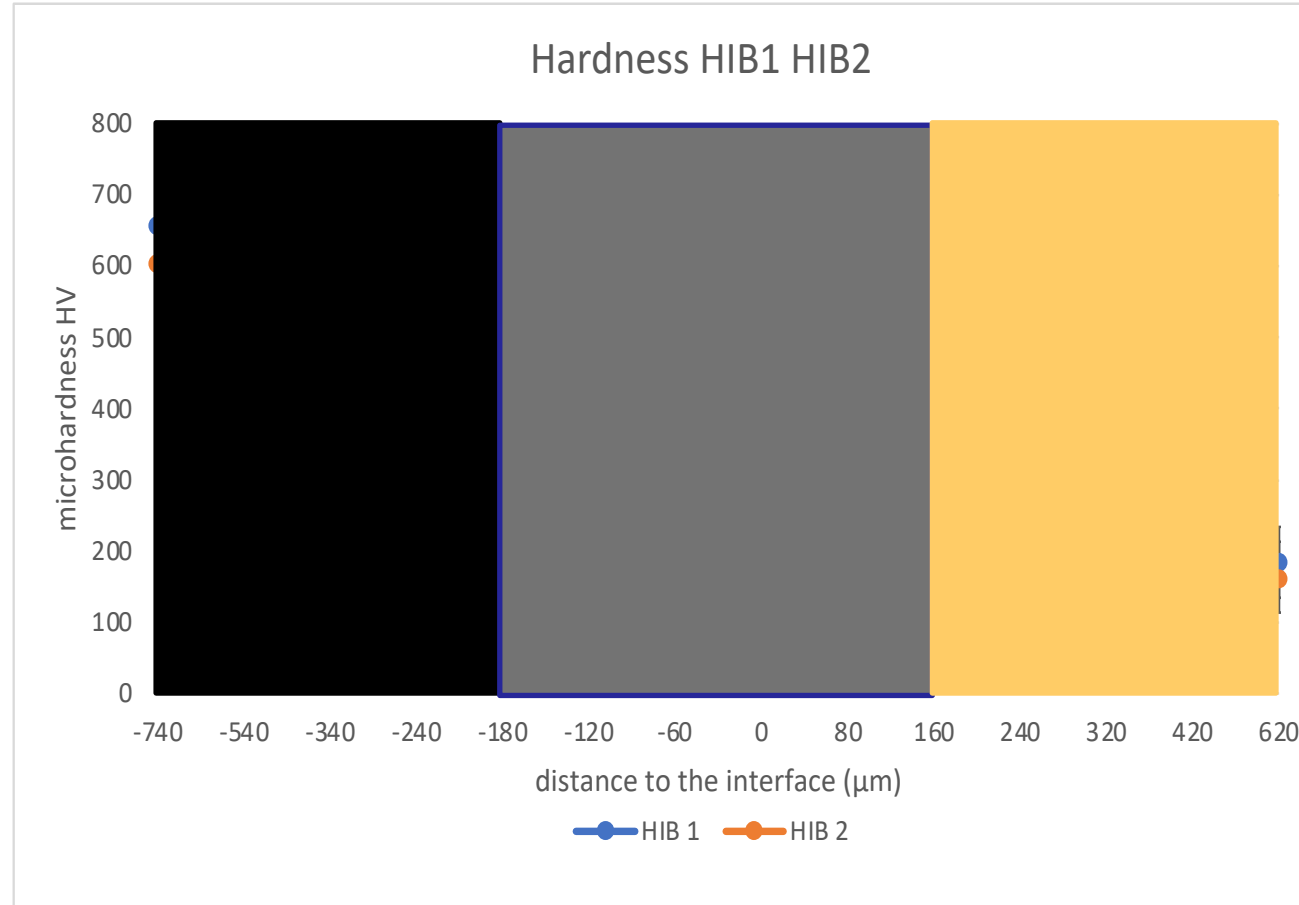


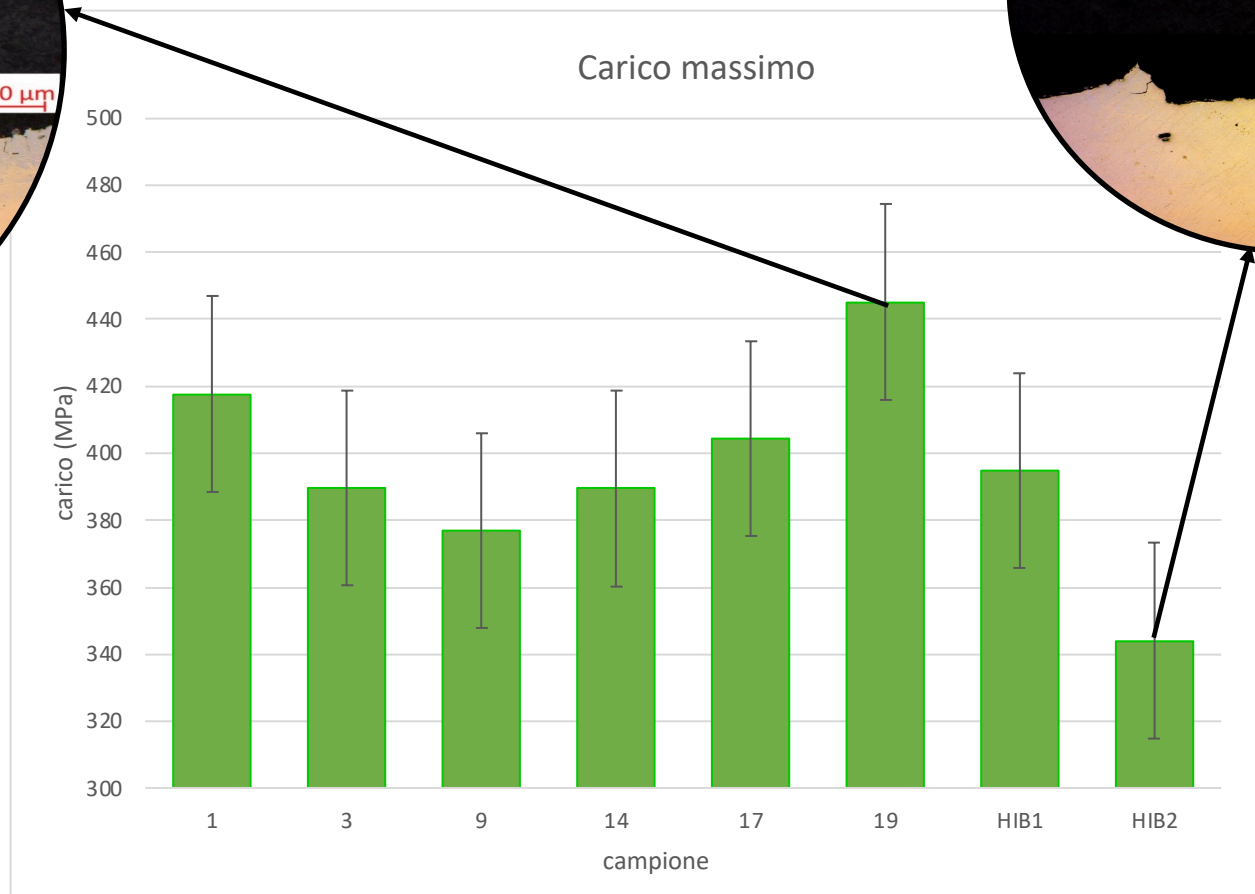
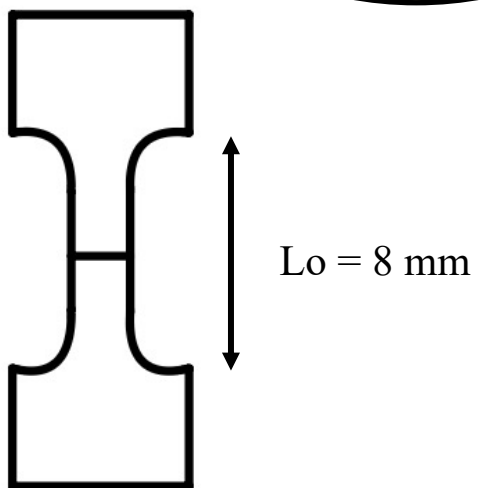
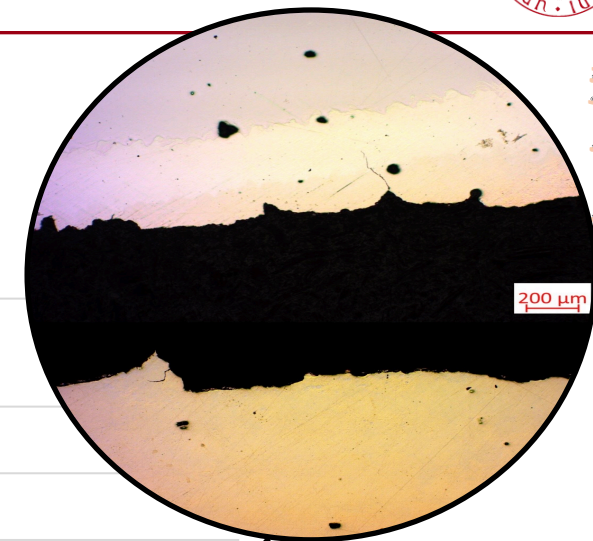
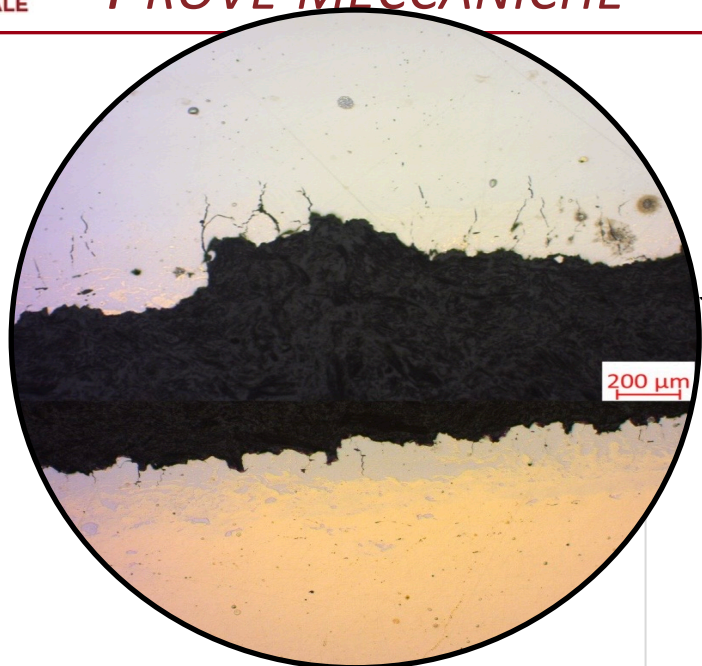


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Microcracks







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1. La potenza influisce in maniera diretta sulle difettualità dell'interfaccia;
2. La velocità influisce in maniera diretta sull'estensione della zona di rimescolamento;
3. La qualità dei manufatti dipende sempre da una combinazione dei parametri di scansione;
4. La tecnica del *remelting* potrebbe essere una buona soluzione per la realizzazione di questi provini.

Grazie per l'attenzione!