

Aka-Brief #19 Superalloys with Diffusion Coatings

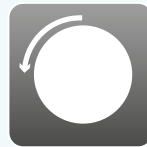
1



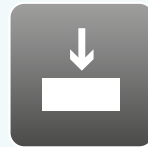
Rhaco Grit
P120



Water



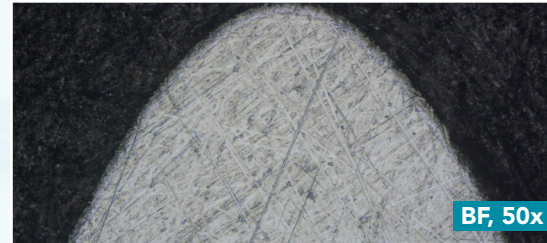
300 rpm



25 N

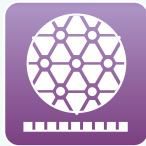


Until plane



BF, 50x

2



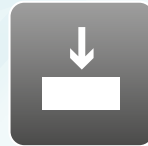
Allegran 9



DiaUltra
9 μm



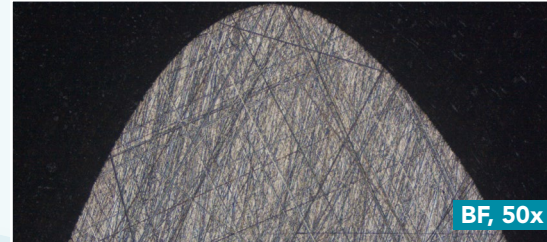
150 rpm



35 N



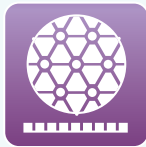
2:00 min



BF, 50x

3

*



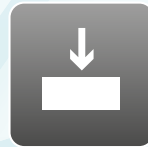
Largan 9



DiaUltra
9 μm



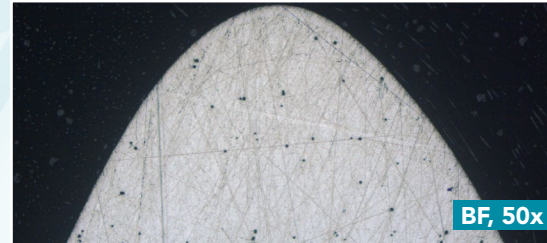
150 rpm



35 N



2:00 min



BF, 50x

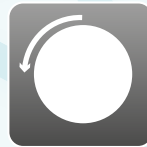
4



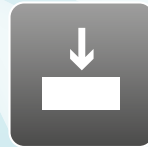
Silk



DiaUltra
3 μm



150 rpm



30 N



2:00 min



BF, 50x

5

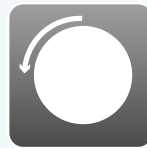
**



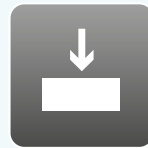
Chemal***



Fumed Silica
0.2 μm
Alkaline



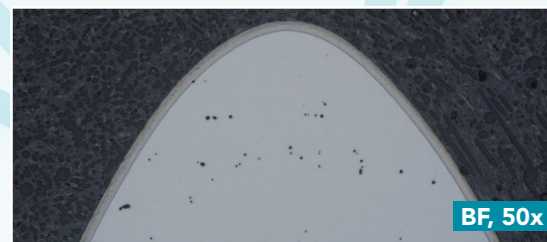
150 rpm



15 N



2:00 min



BF, 50x

Times are stated for a 300 mm preparation system and forces for an individual 40 mm dia. sample.

On a 250 mm system the times should be increased by 30%, on a 200 mm system by 100%.

With larger samples the force should be increased, with smaller samples decreased.

The rotational speed of the head (sample holder or sample mover plate) used is 150 rpm.

Time and force may vary depending on the equipment.

* No cleaning is necessary between Step 2 and 3 as the same diamond grain size is used for both steps.

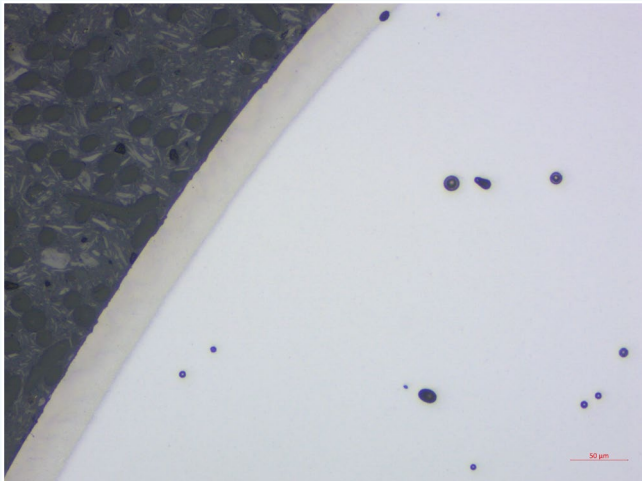
** If the finish of the coatings is not scratch-free after oxide polishing, this step can be replaced by a 1 μm step on a Napal cloth with 20 N for 2 min. Oxide polishing can be used afterwards if an etching of the substrate is required.

*** Prior to oxide polishing the polishing cloth should be wetted with water until the holder touches the polishing cloth. For the last 10 seconds of the oxide polishing step, the polishing cloth should be flushed with water to clean both sample(s) and polishing cloth.

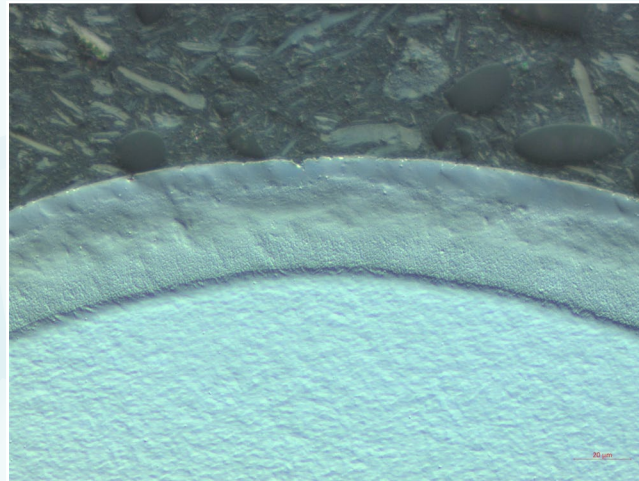


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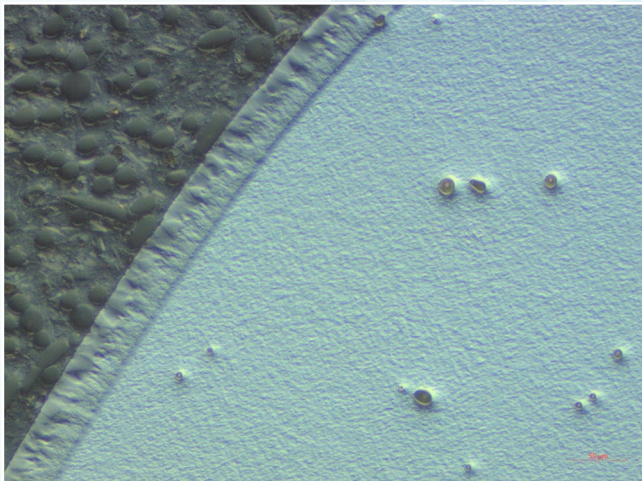
FINAL RESULT



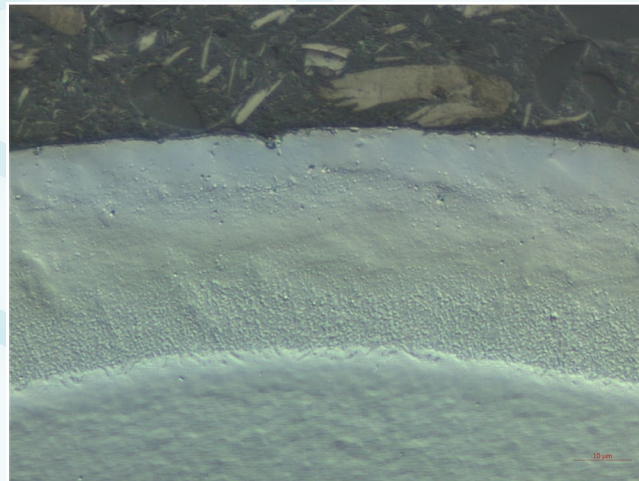
Porosity in Superalloy substrate, BF, 200x



Diffusion coatings, DIC, 500x



Porosity in Superalloy substrate, DIC, 200x



Diffusion coatings, DIC, 1000x