



Newsletter – September 2016

HONEYCOMB SEALS



Prevent leakage flow and improve engine efficiency



Honeycomb Seal advantages

Honeycomb's natural design provides high structural strength with minimum weight. This typical structure is applied to engine seals parts.

Why are Honeycomb Seals needed in engine?

- To seal and minimize the leakage flows,
- To control proper pressure levels throughout the engine,
- To improve engine efficiency,
- Honeycomb seals survive to aggressive environment : resist to hot gas corrosion & have good abrasability.

CRMA's Machining & Brazing expertise



In 2012 a **dedicated product line** has been created for honeycomb parts in CRMA in order to have more control in TAT and maximize performance. Since then, more than **300 parts** have been repaired per year!

CRMA's operators are remanufacturing honeycomb seals to a like-new condition, allowing cost saving compared to new parts while guaranteeing flight safety. High quality machining performed by our specialized operators ensures the lowest possible roughness during the removal of the old honeycomb seal. A low surface roughness is recommended to remanufacture at **high precision** and avoid starting over with a new cycle of machining & brazing: doing it right the first time! This requires a good expertise.

CRMA's **brazing preparation** in a dedicated gray room (controlled environment without dust) includes two workstations. After this preparation, honeycomb seal is going to a brazing cycle and **heat treatment** in a low pressure vacuum.



Electro Discharge Machining (**EDM**) allows machining at high tolerances while minimizing constraints on honeycomb seals. High accuracy adjustments at the right dimensions are required to reduce the gap between the interface part and the seal teeth; minimizing leakages flows and thereupon increase **engine performance**.

CRMA's honeycomb repairs Capability List

Introducing Very Big Engines (GE90 & GP7200):

CF6-80

Stationary CDP Air Seal
N°4R Bearing Vent Seal

CFM56 series

HPT Inner Stationary Seal
HPT Outer Stationary Seal
Forward Inner Nozzle Support
LPT Forward Rotating Air Seal

GE90-94

Forward Outer Seal
Outlet Guide Vane Stage 10

GE90-115

Forward Outer Seal
Outlet Guide Vane Stage 9

GP7200

Thrust Balance (in progress)

Skilled and experienced team :



MRO EUROPE

18-20 October, 2016



Jimmy HILLERAUD Guillaume BLONDEL Fabien EL MAWAS

CRMa^o
Aero repair

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Conference October 18-20, 2016
Exhibition October 19-20, 2016
The RAI
Amsterdam, The Netherlands