



1
00:00:00,936 --> 00:00:02,736
At NASA Glenn we're
currently working

2
00:00:02,906 --> 00:00:05,336
on investigating ceramic
matrix composites.

3
00:00:05,826 --> 00:00:07,936
The reason we're interested
in this material system is

4
00:00:07,976 --> 00:00:09,826
because they offer a
variety of benefits

5
00:00:09,856 --> 00:00:12,606
over current materials used
in aircraft engines today.

6
00:00:13,186 --> 00:00:14,736
Ceramics compared with metals,

7
00:00:15,266 --> 00:00:17,756
actually can handle much
higher operating temperatures

8
00:00:17,986 --> 00:00:18,766
and are lighter.

9
00:00:19,296 --> 00:00:21,786
As a result by replacing
current metal-based parts

10
00:00:21,836 --> 00:00:23,536
in aircraft engines, we hope

11
00:00:23,536 --> 00:00:26,726
that by applying ceramic matrix

composites we'll get better fuel

12

00:00:26,726 --> 00:00:30,916
economy and efficiency in future
generations of aircraft engines.

13

00:00:31,546 --> 00:00:34,576
NASA is pushing the extremes
of this particular material

14

00:00:35,036 --> 00:00:37,506
by evaluating ceramic
matrix composites

15

00:00:37,556 --> 00:00:40,406
for the mechanical properties
as well as their temperature

16

00:00:40,406 --> 00:00:42,286
and thermal properties to ensure

17

00:00:42,286 --> 00:00:44,376
that these materials
will be safe as well

18

00:00:44,376 --> 00:00:47,546
as offer significant benefits
over current metal-based parts

19

00:00:47,716 --> 00:00:48,926
that are commonly used today.

20

00:00:49,226 --> 00:00:50,446
Currently we are working

21

00:00:50,446 --> 00:00:52,926
on 3D printing ceramic
matrix composites.

22

00:00:53,286 --> 00:00:56,086

With 3D printing we can actually attain a variety

23

00:00:56,086 --> 00:00:59,536

of geometries more quickly as well as more economically

24

00:00:59,586 --> 00:01:01,466

than conventional processing methods.

25

00:01:02,296 --> 00:01:05,046

From 3D printing we can actually take a part prepared

26

00:01:05,406 --> 00:01:07,616

and then evaluate it using a burner rig.

27

00:01:07,826 --> 00:01:11,836

It allows us to evaluate a more realistic environment seen

28

00:01:11,936 --> 00:01:13,516

in an aircraft engine.

29

00:01:14,006 --> 00:01:16,596

With the burner rig we can actually flow through jet fuel

30

00:01:16,596 --> 00:01:18,976

that we can ignite and achieve temperatures

31

00:01:18,976 --> 00:01:21,186

of to 2700 degrees Fahrenheit

32

00:01:21,506 --> 00:01:24,616

that we can subject different

parts including ceramics to,