
Saffire

1
00:00:00,000 --> 00:00:02,398
a birthday candle parents have been

2
00:00:02,399 --> 00:00:03,989
putting them on children's cakes for

3
00:00:03,990 --> 00:00:06,449
centuries the parents light the wick the

4
00:00:06,450 --> 00:00:08,669
heat from the flame melts and vaporizes

5
00:00:08,670 --> 00:00:11,279
the wax which is then burned we expect

6
00:00:11,280 --> 00:00:13,199
even young kids to be able to blow out

7
00:00:13,200 --> 00:00:15,598
the candles because those flames are not

8
00:00:15,599 --> 00:00:18,209
that scary conditions for a larger more

9
00:00:18,210 --> 00:00:20,038
dangerous fire occurs when you have more

10
00:00:20,039 --> 00:00:22,259
fuel fresh air and an ignition source

11
00:00:22,260 --> 00:00:24,929
the larger the fire the greater the

12
00:00:24,930 --> 00:00:26,549
amount of heat released by the chemical

13
00:00:26,550 --> 00:00:29,219

reaction and more hazardous the fire is

14
00:00:29,220 --> 00:00:31,438
depending on the balance between the

15
00:00:31,439 --> 00:00:33,839
chemical reaction and heat transfer a

16
00:00:33,840 --> 00:00:36,148
small flame can grow into a very serious

17
00:00:36,149 --> 00:00:38,459
fire way beyond what you could hope to

18
00:00:38,460 --> 00:00:41,279
blow out at NASA Glenn we are operating

19
00:00:41,280 --> 00:00:43,529
an experiment in space called saffire

20
00:00:43,530 --> 00:00:45,929
that is much larger than anything we've

21
00:00:45,930 --> 00:00:48,509
ever burned three saffire experiments

22
00:00:48,510 --> 00:00:50,128
will be completed soon and we are

23
00:00:50,129 --> 00:00:51,988
building three more to continue to learn

24
00:00:51,989 --> 00:00:54,389
about material flammability and study

25
00:00:54,390 --> 00:00:56,999
fire detection monitoring and clean up

26
00:00:57,000 --> 00:01:00,328
in future NASA missions a fire in a

27
00:01:00,329 --> 00:01:02,398
spacecraft is one of the most hazardous

28
00:01:02,399 --> 00:01:04,919
conditions that an astronaut crew might

29
00:01:04,920 --> 00:01:07,438
face and so we want to learn how it will

30
00:01:07,439 --> 00:01:09,389
burn so that we can give them the proper

31
00:01:09,390 --> 00:01:11,938
tools so that they can respond to it

32
00:01:11,939 --> 00:01:14,399
protect themselves and extinguish it as

33
00:01:14,400 --> 00:01:17,699
rapidly as possible and saffire one we

34
00:01:17,700 --> 00:01:20,849
were looking at a single large fuel

35
00:01:20,850 --> 00:01:24,059
sample and what we learned was the flame

36
00:01:24,060 --> 00:01:27,059
very rapidly reached a steady size and

37
00:01:27,060 --> 00:01:29,938
shape and spread rate and it also burned

38
00:01:29,939 --> 00:01:31,319

a little bit slower than what we were

39
00:01:31,320 --> 00:01:34,529
anticipating we also saw that it burned

40
00:01:34,530 --> 00:01:39,389
just as rapidly into the incoming air as

41
00:01:39,390 --> 00:01:41,609
it did when it was burning with the

42
00:01:41,610 --> 00:01:44,398
incoming air saffire two has the same

43
00:01:44,399 --> 00:01:47,969
general shape of the experiment but it

44
00:01:47,970 --> 00:01:50,459
the samples card has nine samples of

45
00:01:50,460 --> 00:01:52,769
different materials these materials have

46
00:01:52,770 --> 00:01:55,199
flammability limits that are at

47
00:01:55,200 --> 00:01:57,089
different oxygen levels but there are

48
00:01:57,090 --> 00:01:59,158
also some materials that are used in

49
00:01:59,159 --> 00:02:01,408
different places on a spacecraft that we

50
00:02:01,409 --> 00:02:03,809
want to study how they burn since the

51
00:02:03,810 --> 00:02:05,459
very beginning one of Glenn's strengths

52
00:02:05,460 --> 00:02:07,289
has been physical sciences in

53
00:02:07,290 --> 00:02:10,499
microgravity studying how fluid transfer

54
00:02:10,500 --> 00:02:13,309
combustion is different in

55
00:02:13,310 --> 00:02:15,708
low gravity than it is in normal gravity and

56
00:02:15,709 --> 00:02:18,469
so we've really taken that role about

57
00:02:18,470 --> 00:02:21,859
low gravity science within NASA and led

58
00:02:21,860 --> 00:02:24,348
that for many years the purpose of this

59
00:02:24,349 --> 00:02:26,119
work is to protect the crew from any

60
00:02:26,120 --> 00:02:28,909
fire that may happen on a spacecraft so

61
00:02:28,910 --> 00:02:30,018
it's very much

62
00:02:30,019 --> 00:02:37,068
supporting NASA's journey to Mars as

63
00:02:37,069 --> 00:02:39,619

you can see cygnus lifting off on top of

64
00:02:39,620 --> 00:02:41,629
its antares rocket on its mission to