



1

00:00:01,480 --> 00:00:03,830

Narrator: NASA is developing the next generation

2

00:00:03,830 --> 00:00:06,980

of heat shield to enable astronauts to go to Mars

3

00:00:06,980 --> 00:00:09,990

and other deep space destinations.

4

00:00:09,990 --> 00:00:11,780

(Snapping Clink Sound)

5

00:00:11,780 --> 00:00:13,980

Narrator: A team at NASA's Ames Research Center

6

00:00:13,980 --> 00:00:16,800

developed a system that is lightweight, compact

7

00:00:16,800 --> 00:00:19,530

and opens like an umbrella.

8

00:00:19,530 --> 00:00:22,090

Called the Adaptive Deployable Entry and Placement

9

00:00:22,090 --> 00:00:24,970

Technology or ADEPT, the heat shield is

10

00:00:24,970 --> 00:00:28,110

mechanically deployable and uses a flexible woven

11

00:00:28,110 --> 00:00:30,930

carbon fabric as its skin.

12

00:00:30,930 --> 00:00:33,450

Once deployed, the fabric is stretched into a

13

00:00:33,450 --> 00:00:35,950

semi-rigid structure that will protect the vehicle

14  
00:00:35,950 --> 00:00:38,390  
behind it from the extreme heating conditions

15  
00:00:38,390 --> 00:00:40,260  
of atmospheric entry.

16  
00:00:40,260 --> 00:00:43,380  
Male Test Engineer: 4...3...2...1...

17  
00:00:43,380 --> 00:00:45,150  
Narrator: Recently, engineers successfully

18  
00:00:45,150 --> 00:00:47,090  
completed a series of tests in the

19  
00:00:47,090 --> 00:00:49,530  
Ames Arc Jet facility.

20  
00:00:49,530 --> 00:00:51,660  
This laboratory creates a high-speed flow of

21  
00:00:51,660 --> 00:00:54,430  
heated gases that simulate the conditions

22  
00:00:54,430 --> 00:00:56,690  
spacecraft experience when they enter

23  
00:00:56,690 --> 00:00:58,990  
a planetary atmosphere.

24  
00:00:58,990 --> 00:01:02,280  
Female Test Engineer: In 5...4...3...2...1...

25  
00:01:02,280 --> 00:01:04,290  
Male Test Engineer: West model is in.

26  
00:01:04,290 --> 00:01:06,530  
Narrator: Several ADEPT models were shown to

27  
00:01:06,530 --> 00:01:10,770  
easily withstand a hot gas flow up to 3,100

28  
00:01:10,770 --> 00:01:14,220  
degrees Fahrenheit, a condition similar to what

29  
00:01:14,220 --> 00:01:15,990  
spacecraft would experience entering

30  
00:01:15,990 --> 00:01:18,690  
the Martian atmosphere.

31  
00:01:18,690 --> 00:01:21,180  
Other tests conducted in wind tunnels at Ames

32  
00:01:21,180 --> 00:01:24,100  
demonstrated that the ADEPT materials and system

33  
00:01:24,100 --> 00:01:28,170  
perform well under planetary re-entry conditions.

34  
00:01:28,170 --> 00:01:30,950  
Researchers hope to develop ADEPT at a much larger

35  
00:01:30,950 --> 00:01:33,640  
scale so it can be considered as a potential heat

36  
00:01:33,640 --> 00:01:36,040  
shield solution for a spacecraft that would

37  
00:01:36,040 --> 00:01:39,680  
someday carry crew and a large payload to Mars

38  
00:01:39,680 --> 00:01:41,720

or beyond.