



1

00:00:00,000 --> 00:00:04,070

Narrator: When the SpaceX Dragon spacecraft returns to Earth

2

00:00:04,090 --> 00:00:06,730

after its mission to the International Space Station,

3

00:00:06,750 --> 00:00:10,140

it will depend on a heat shield material called PICA-X to

4

00:00:10,160 --> 00:00:12,690

protect it during reentry.

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00:00:12,710 --> 00:00:15,780

The heat shield material, called Phenolic Impregnated Carbon

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00:00:15,800 --> 00:00:19,170

Ablator or PICA-X, was developed in partnership with

7

00:00:19,190 --> 00:00:21,350

NASA Ames Research Center.

8

00:00:21,370 --> 00:00:23,600

Dan Rasky: So we were looking for an advanced material that was

9

00:00:23,620 --> 00:00:27,600

lighter weight, could withstand more extreme environments

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00:00:27,620 --> 00:00:30,770

and would be, essentially, safer and more rugged

11

00:00:30,790 --> 00:00:33,060

for planetary missions.

12

00:00:33,080 --> 00:00:36,610

Narrator: Slightly denser than balsa wood, PICA proved itself to

13

00:00:36,630 --> 00:00:39,680

be highly effective as the heat shield material that protected

14
00:00:39,700 --> 00:00:42,200
the Stardust capsule during its return to Earth

15
00:00:42,220 --> 00:00:45,140
in January of 2006.

16
00:00:45,160 --> 00:00:48,560
It set the record for the fastest Earth reentry speed of any

17
00:00:48,580 --> 00:00:52,970
human-made object on its return from deep space.

18
00:00:52,990 --> 00:00:56,130
It is currently in use on the Mars Science Laboratory mission to

19
00:00:56,150 --> 00:00:58,750
protect it during its landing on the Martian surface

20
00:00:58,770 --> 00:01:01,820
anticipated in August of 2012.

21
00:01:01,840 --> 00:01:05,510
PICA-X samples were tested at NASA Ames using special facilities

22
00:01:05,530 --> 00:01:08,130
to simulate planetary reentry temperatures and

23
00:01:08,150 --> 00:01:10,940
high speed atmospheric flows.

24
00:01:10,960 --> 00:01:13,970
During these test, the surface temperature of the heat shield

25
00:01:13,990 --> 00:01:19,050
material reached approximately 3,450 degrees Fahrenheit,

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00:01:19,070 --> 00:01:21,980

almost twice as hot as molten lava.

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00:01:22,000 --> 00:01:25,070

Dan Rasky: We have a unique combination of expertise,

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00:01:25,090 --> 00:01:29,980

facilities, along with a collaborative culture that makes it

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00:01:30,000 --> 00:01:32,920

welcoming for these companies, particularly the emerging space

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00:01:32,940 --> 00:01:36,500

companies, to work with us to further their goals

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00:01:36,520 --> 00:01:39,180

and business plans.

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00:01:39,200 --> 00:01:41,860

Narrator: This will be the first time an unmanned cargo resupply

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00:01:41,880 --> 00:01:46,190

mission to the ISS will return a payload back to Earth.

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00:01:46,210 --> 00:01:49,470

A big part of the success of the Dragon mission will depend

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00:01:49,490 --> 00:01:52,510

on the PICA-X heat shield.