1
00:00:18,470 --> 00:00:15,749
the james webb space telescope is

2
00:00:20,630 --> 00:00:18,480
primarily an infrared telescope which

3
00:00:23,189 --> 00:00:20,640
means it has to be kept as cold as

4
00:00:25,670 --> 00:00:23,199
possible the shape of the sun shield

5
00:00:28,230 --> 00:00:25,680
helps it achieve and maintain those low

6
00:00:29,990 --> 00:00:28,240
temperatures to find out just how

7
00:00:32,069 --> 00:00:30,000
engineers on the ground are making sure

8
00:00:34,709 --> 00:00:32,079
that each layer of the sun shield is

9
00:00:37,830 --> 00:00:34,719
built correctly we are here at mantec in

10
00:00:39,830 --> 00:00:37,840
huntsville alabama so jason this is the

11
00:00:40,709 --> 00:00:39,840
sun shield what's so unique about its

12
00:00:43,270 --> 00:00:40,719
shape

13
00:00:45,190 --> 00:00:43,280

this one tenth scale model the sunshield

14
00:00:47,110 --> 00:00:45,200
from afar looks like a flat piece of

15
00:00:49,190 --> 00:00:47,120
material but it actually has a doubly

16
00:00:50,630 --> 00:00:49,200
curved shape which means it's almost a

17
00:00:53,270 --> 00:00:50,640
funnel towards the center of the

18
00:00:55,430 --> 00:00:53,280
telescope what we're about to see is a

19
00:00:56,869 --> 00:00:55,440
full scale layer and show you how we

20
00:00:58,470 --> 00:00:56,879
measure that shape

21
00:01:00,630 --> 00:00:58,480
there are five layers is each layer the

22
00:01:02,869 --> 00:01:00,640
same no actually each layer is different

23
00:01:04,869 --> 00:01:02,879
the layers are designed so that we get

24
00:01:06,550 --> 00:01:04,879
maximum heat rejection between each

25
00:01:08,710 --> 00:01:06,560
layer all the way up to layer five on

26
00:01:10,469 --> 00:01:08,720
top so that way layer one will always be

27
00:01:12,230 --> 00:01:10,479
the hottest facing the sun and layer

28
00:01:13,750 --> 00:01:12,240
five will be the coldest allowing the

29
00:01:15,590 --> 00:01:13,760
telescope to achieve operating

30
00:01:17,670 --> 00:01:15,600
temperature so you mean the shape of

31
00:01:18,789 --> 00:01:17,680
each layer is different yes actually it

32
00:01:21,270 --> 00:01:18,799
is

33
00:01:23,429 --> 00:01:21,280
great so we can go check it out now yes

34
00:01:25,830 --> 00:01:23,439
we can all right great over here we

35
00:01:27,510 --> 00:01:25,840
actually have one layer deployed in a

36
00:01:29,990 --> 00:01:27,520
flight-like simulator

37
00:01:32,870 --> 00:01:30,000
and it's tension to the loads that it'll

38
00:01:33,990 --> 00:01:32,880

see on orbit so like you said it is not

39
00:01:36,390 --> 00:01:34,000
flat

40
00:01:38,310 --> 00:01:36,400
no it's not you see it makes a funnel

41
00:01:40,550 --> 00:01:38,320
type shape towards the center of the of

42
00:01:41,990 --> 00:01:40,560
the telescope where daryl is standing

43
00:01:43,910 --> 00:01:42,000
the telescope will be sitting right

44
00:01:45,109 --> 00:01:43,920
there in the center facing us so what is

45
00:01:47,510 --> 00:01:45,119
he about to do

46
00:01:50,069 --> 00:01:47,520
he's about to set up a laser scanner we

47
00:01:51,910 --> 00:01:50,079
use the scanning system to measure the

48
00:01:53,350 --> 00:01:51,920
overall shape of the membrane we

49
00:01:54,950 --> 00:01:53,360
actually do seven different scans in

50
00:01:57,670 --> 00:01:54,960
seven locations

51
00:02:00,469 --> 00:01:57,680
each scan one 360 degree scan

52
00:02:02,630 --> 00:02:00,479
creates about 407 million points we

53
00:02:04,950 --> 00:02:02,640
combine those seven scans together to

54
00:02:06,550 --> 00:02:04,960
get enough points to build a solid 3d

55
00:02:08,469 --> 00:02:06,560
shape of the membrane to compare to our

56
00:02:10,389 --> 00:02:08,479
analytical model thanks jason for

57
00:02:12,309 --> 00:02:10,399
showing us just what you guys do to make

58
00:02:14,150 --> 00:02:12,319
sure the sun shield is built correctly

59
00:02:16,229 --> 00:02:14,160
thanks mary for coming to see it

60
00:02:18,949 --> 00:02:16,239
after testing here is completed the

61
00:02:21,190 --> 00:02:18,959
layer will be prepared for integration

62
00:02:23,350 --> 00:02:21,200
with the rest of the sunshield thanks