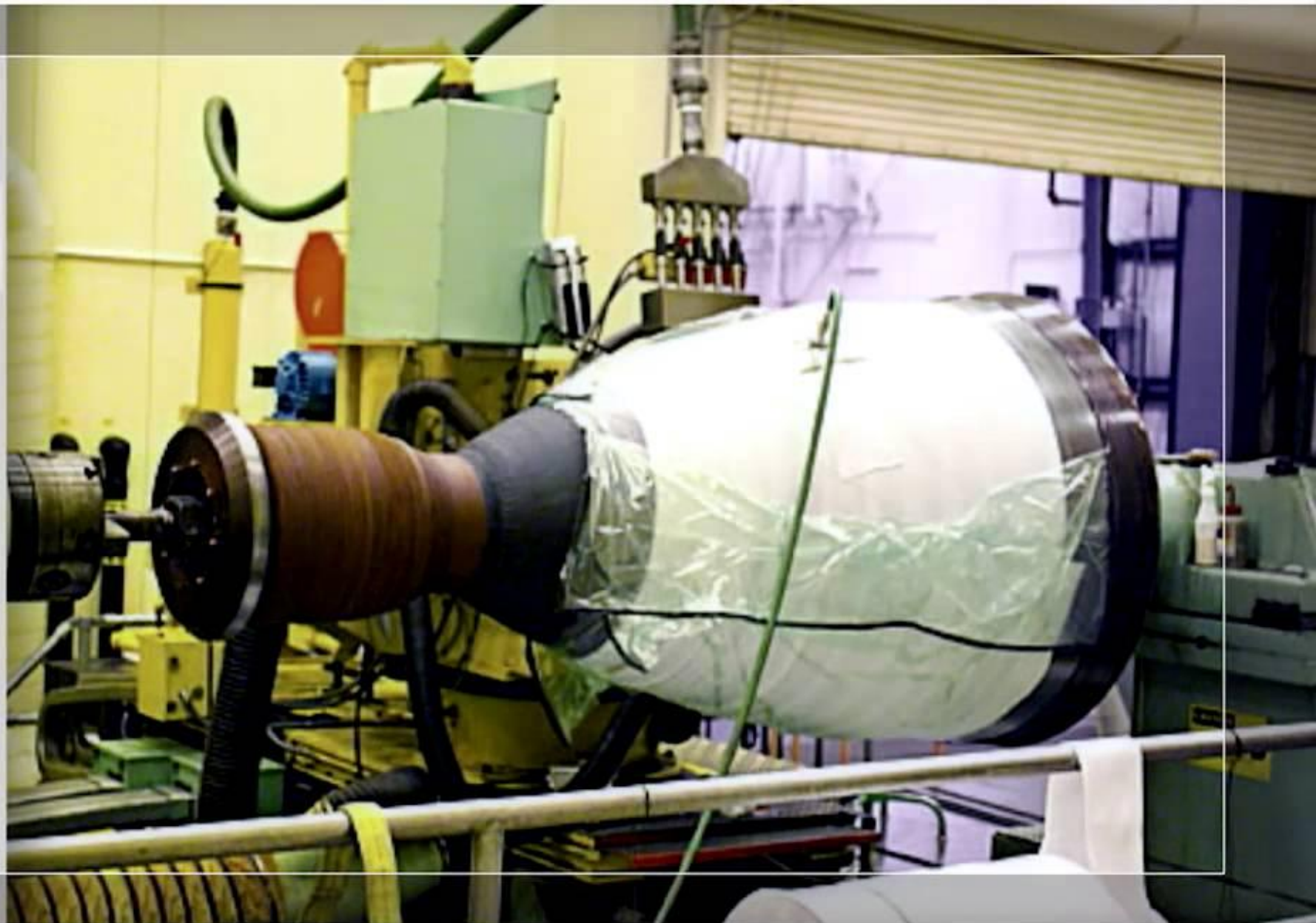


FOUR AXIS FILAMENT WINDING

Automated process

Repeatable parts

Various material forms



1
00:00:00,000 --> 00:00:08,099
Music full then under VO.

2
00:00:08,134 --> 00:00:12,691
The composites manufacturing team provides

3
00:00:12,726 --> 00:00:15,444
advance composite structures

4
00:00:15,479 --> 00:00:18,628
development utilizing state of the art

5
00:00:18,663 --> 00:00:21,268
methods. The team is able to provide

6
00:00:21,303 --> 00:00:23,572
engineering solutions manufacturing

7
00:00:23,607 --> 00:00:25,907
development and full scale hardware

8
00:00:25,942 --> 00:00:28,067
production. From working with ultra

9
00:00:28,102 --> 00:00:29,571
- lightweight composite materials

10
00:00:29,606 --> 00:00:31,043
with less expensive

11
00:00:31,078 --> 00:00:33,635
tooling to creating items to withstand

12
00:00:33,670 --> 00:00:35,923
cryogenic fluids. These are just a few

13
00:00:35,958 --> 00:00:37,620

examples of how Marshall

14

00:00:37,655 --> 00:00:39,108

has provided a wide

15

00:00:39,143 --> 00:00:40,067

range of services for

16

00:00:40,102 --> 00:00:41,604

NASA programs as well

17

00:00:41,639 --> 00:00:43,140

as private industry and other government

18

00:00:43,175 --> 00:00:45,203

agencies. With

19

00:00:45,238 --> 00:00:46,579

collaboration efforts ever

20

00:00:46,614 --> 00:00:47,699

expanding and state

21

00:00:47,734 --> 00:00:49,267

of the art capabilities

22

00:00:49,302 --> 00:00:50,819

this organization is well equipped to

23

00:00:50,854 --> 00:00:52,468

efficiently respond to

24

00:00:52,503 --> 00:00:53,796

the demands of todays

25

00:00:53,831 --> 00:00:55,028

affordable manufacturing

26
00:00:55,063 --> 00:00:57,332
requirements. At

27
00:00:57,367 --> 00:00:58,548
Marshall we're unique

28
00:00:58,583 --> 00:00:59,875
in that we are not a

29
00:00:59,910 --> 00:01:02,580
manufacturing shop where we mass produce

30
00:01:02,615 --> 00:01:03,779
items, we're more of a

31
00:01:03,814 --> 00:01:04,931
research and development

32
00:01:04,966 --> 00:01:06,467
type facility so we

33
00:01:06,502 --> 00:01:07,811
can take the composite

34
00:01:07,846 --> 00:01:09,220
materials and improve

35
00:01:09,255 --> 00:01:11,572
on those and invent

36
00:01:11,607 --> 00:01:13,699
processes for manufacturing of

37
00:01:13,734 --> 00:01:16,868
composite materials. Marshall's filament

38
00:01:16,903 --> 00:01:18,755

winding facility is extremely

39

00:01:18,790 --> 00:01:20,836

versatile and has produced structures

40

00:01:20,871 --> 00:01:23,379

for many programs. This capability

41

00:01:23,414 --> 00:01:26,099

was first established in 1985 during

42

00:01:26,134 --> 00:01:28,083

the composite solid rocket motor

43

00:01:28,118 --> 00:01:30,036

case development effort for the space

44

00:01:30,071 --> 00:01:32,196

shuttle. Marshall has two modern

45

00:01:32,231 --> 00:01:34,612

four axis filament winding machines,

46

00:01:34,647 --> 00:01:35,892

that are outfitted with fiber

47

00:01:35,927 --> 00:01:38,338

tensioning systems. These machines can

48

00:01:38,373 --> 00:01:40,292

support various structures such as

49

00:01:40,327 --> 00:01:43,523

pressure vessels motor cases, tubes and

50

00:01:43,558 --> 00:01:45,315

other such structures as defined by

51
00:01:45,350 --> 00:01:48,036
the partner. Marshall has clean room

52
00:01:48,071 --> 00:01:49,636
facilities that can be used for a

53
00:01:49,671 --> 00:01:51,284
variety of non-automated

54
00:01:51,319 --> 00:01:52,676
processes, that

55
00:01:52,711 --> 00:01:54,419
involve hand layup of material, vaccumn

56
00:01:54,454 --> 00:01:57,107
bagging and oven or auto-clavving

57
00:01:57,142 --> 00:02:00,419
curing. This capability is supported

58
00:02:00,454 --> 00:02:01,827
by test facilities and provides

59
00:02:01,862 --> 00:02:03,428
support to advance materials

60
00:02:03,463 --> 00:02:05,380
development and digital manufacturing

61
00:02:05,415 --> 00:02:07,236
efforts. We are a one stop shop for

62
00:02:07,271 --> 00:02:09,796
an industrial partner you can get

63
00:02:09,831 --> 00:02:12,115

everything done at one location. We

64

00:02:12,150 --> 00:02:13,443

have engineering expertise, couple

65

00:02:13,478 --> 00:02:15,635

that with manufacturing abilities and

66

00:02:15,670 --> 00:02:18,211

also with test capabilities. So you

67

00:02:18,246 --> 00:02:20,020

have complete cradle to grave capability