Specifications for Braiding System

The following list of specifications is intended for procurement of a braiding system for manufacturing ropes with experimental materials.

System Specifications:

1. The complete system shall include two separate machines consisting of a single-head braiding machine and a semi-automatic winder.

Single-Head Braiding Machine:

2. The braiding machine shall have one (1) braiding head.
3. The braiding machine shall consist of sixteen carriers with a gauge of 80 mm.
4. The braiding machine shall have a maximum horn gear speed of rpm.
5. The braiding machine shall be compatible with 39 mm diameter by 110 mm bobbins.
6. All mechanical components of the braiding machine shall be surrounded by a guard and include an interlock system to prevent machine operation if the guard is breeched.
7. The braiding machine shall include a motorized take-off system.
8. The braiding machine shall include yarn tensioners with open-ceramics eyelets.
9. The braiding machine take-off system shall be compatible with 125 mm diameter by 100 mm plastic spools.
10. The braiding machine shall include four sets of yarn tensioners rated to the following tensions: 10 g, 20 g, 30 g, and 40 g.
11. The take-off system shall consist of grooved metallic wheels capable of producing a maximum cord size of 5 mm in diameter.
12. The braiding machine shall include one frequency shifter rated to at least 0.25 hp for adjusting individual braider speed.
13. The braiding machine shall include a programmable controller allowing control over the braiding system to include braider speed and helix pitch.
14. The programmable controller shall be capable of storing at least 100 recipes.
15. The braiding machine shall include a display showing critical run parameters including time and meters produced.
16. The braiding machine shall be capable of manual control over system overall status (on/off), pulse, and reverse operation.

17. The braiding machine shall include information on machine operation including faults with indicators for open-door, tangling, and yarn depletion.
18. The electrical box and user interface shall be attached to the braiding machine frame.
19. The braiding machine will use standard utility hookups for 480 V, 3-phase, 60 Hz power. All utility requirements shall be submitted to NASA Langley Research Center for approval prior to contract award.
20. The braiding machine will be supplied with a power cord and plug on each machine. The plug type will be specified by NASA upon award.
21. The braiding machine shall include an emergency stop button located on the electrical control panel.
22. An operation manual as well as mechanical, pneumatic, and electrical systems drawings shall be included.
23. Each carrier on the braiding machine shall be powered by one 0.33 hp motor with a speed rating of at least 1440 rpm.
24. Each carrier on the braiding machine shall be equipped with a sensing system to stop the braiding machine in the event of yarn breakage or runout.

Semi-Automatic Winder:

25. The semi-automatic winder shall consist of two spindles for parallel winding.
26. The semi-automatic winder shall be designed for winding on 39 mm diameter by 110 mm bobbins.
27. The semi-automatic winder shall have an adjustable traverse of 10 mm to 220 mm.
28. The semi-automatic winder shall be powered by an electric motor with a rating of at least 0.5 hp.
29. The semi-automatic winder shall consist of at least one brake tensioner per spindle.
30. The semi-automatic winder shall have an adjustable pitch of 0 mm to 11 mm.
31. The semi-automatic winder shall include one precision digital tensioner for each bobbin (two total).
32. The semi-automatic winder shall be capable of constant control over yarn tension regardless of winding speed.
33. The semi-automatic winder shall include a controller for adjusting yarn tension and speed.

34. The semi-automatic winder will use standard utility hookups for power for 480 V, 3-phase, 60 Hz. All utility requirements shall be submitted to NASA Langley Research Center for approval prior to contract award.

35. The semi-automatic winder will be supplied with a power cord and plug on each machine. The plug type will be specified by NASA upon award.

36. The semi-automatic winder shall include an emergency stop button located on the electrical control panel.

37. An operation manual as well as mechanical, pneumatic, and electrical systems drawings shall be included.

Machine Accessories:

38. The system shall be supplied with ten, 125 mm diameter by 100 mm spools.

39. The system shall be supplied with five sets of thirty-two spools with identifiable set colors (39 mm diameter by 110 mm, 160 total).

40. The system shall be supplied with one extra set of sixteen carriers, 43 mm diameter by 110 mm.

41. The system shall be supplied with sixty-four bobbins (42 mm diameter by 110 mm) with traversed teeth on both flanges.

42. The system shall be supplied with four sets of thirty-two bobbins with identifiable set colors (42 mm diameter by 110 mm, 96 total) with traversed teeth on both flanges.

43. The system shall be supplied with sixteen of each rating of the following spring carriers: 75 g, 100 g, 140 g, 150 g, 210 g, and 450 g.

Overall System:

44. The system design submitted shall include site requirements to support the proper installation and operation of the equipment such as space requirements, floor load requirements for the equipment, utilities, and any other additional equipment, apparatus or services needed for the safe and proper use of the equipment.

45. The final system design shall be approved by NASA Langley Research Center's Information Technology Acquisition Management (ITAM) and safety offices prior to contract award.

46. The acquisition shall include operator training in the setup and use of the braider and semi-automatic winder.

Place of Delivery:

NASA Langley Research
Central Receiving
4 South Marvin Street
Building 1206
Hampton, VA 23681-2199

Lead Time: No more than 22 weeks from receipt of order.