NAVIFLOOR QUALITY CONTROL TEST PROCEDURES

NAVIFLOOR QUALITY CONTROL TEST PRO

Document ID: QC-2023-001

Effective Date: January 1, 2024

Version: 3.2

Classification: Confidential

1. PURPOSE AND SCOPE

1. This document establishes the mandatory quality control test proce

2. These procedures apply to all production units of NaviFloor AMR m

2. DEFINITIONS

1. "Test Environment" means the designated quality control testing ar

2. "Navigation Accuracy" means the measured deviation from progra

3. "Surface Adaptation Index" (SAI) means the proprietary metric mea

3. REQUIRED TEST EQUIPMENT

1. Calibrated LiDAR Testing Array (Model LTA-450 or newer)

2. Surface Friction Coefficient Meter (ISO 13287 compliant)

3. Digital Terrain Mapping Verification System (DTMV-2000)

4. Environmental Control Unit (Temperature: 1 C, Humidity: 2% RH)

5. Certified Reference Surfaces (CRS-101 through CRS-107)

4. PRE-TEST PROCEDURES

1. Environmental Conditions

-

Ambient temperature: 20 C 3 C

-

Relative humidity: 45% 10%

-

Lighting: 500-750 lux at floor level

-

Air filtration: Class 100,000 cleanroom or better

2. System Initialization

- Power system verification (voltage tolerance 0.1V)
- Sensor calibration check
- Navigation system boot sequence verification
- Initial position registration

5. MANDATORY TEST SEQUENCES

1. Basic Navigation Testing

a) Straight-line accuracy test (50m course)

b) Multi-point navigation (12-point standard pattern)

c) Dynamic obstacle avoidance (moving obstacles)

d) Emergency stop function verification

2. Surface Adaptation Testing

a) Transition testing between surface types

b) Incline navigation (0-15 degrees)

c) Variable friction coefficient testing

d) Wet surface navigation capability

3. Mapping Accuracy Verification

a) Real-time map generation accuracy

b) Static obstacle recognition

c) Dynamic environment updating

d) Multi-level transition mapping

6. ACCEPTANCE CRITERIA

1. Navigation Precision

- Path deviation: 5mm
- Rotational accuracy: 0.5 degrees
- Position repeatability: 2mm

2. Surface Adaptation Performance

- Minimum SAI score: 92/100
- Surface transition time: 200ms

- Friction compensation accuracy: 98%

3. Mapping System Performance

- Point cloud density: 1000 points/m

- Feature recognition rate: 99.5%

- Update frequency: 10Hz

7. DOCUMENTATION REQUIREMENTS

1. Each test sequence must be documented with:

-

Test date and time

-

Environmental conditions

-

Test operator identification

-

Equipment calibration status

-

Raw test data

-

Video documentation

-

Exception reports (if applicable)

2. Test results must be uploaded to the Quality Management System

8. NON-CONFORMANCE PROCEDURES

1. Any failure to meet acceptance criteria must be:

a) Immediately reported to Quality Control Supervisor

b) Documented in the Non-Conformance Report System

c) Evaluated for root cause analysis

d) Addressed through corrective action before retesting

9. CERTIFICATION

1. Upon successful completion of all test sequences, the Quality Cont

-

Unit serial number

-

Test completion date

-

Test results summary

-

Digital signature

-

Certification number

10. PROPRIETARY NOTICE

11. REVISION HISTORY

Version 3.2 - January 1, 2024

- Updated SAI acceptance criteria

- Added new surface transition specifications

- Revised documentation requirements

APPROVED BY:

_____

Dr. Elena Kovacs

Chief Research Officer

NaviFloor Robotics, Inc.

Richard Torres

Chief Operating Officer

NaviFloor Robotics, Inc.

Date: _