



Machinery and Equipment Specification

Global Common

SD-000

ISSUED November 30, 1995  
REVISED December 5, 2024

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## 1. Scope

The intent of this document is to identify all Nexteer Automotive Specifications and Industrial Standards associated with the purchase of Custom Equipment.

NOTE: Changes since the last revision are highlighted.

1.1 The following definitions indicate specification requirements.

1.1.1 Global Equipment- Equipment purchases for the following Nexteer locations:

- Saginaw Plants: 3, 4, 6, and 7
- China Plants: 20, 51, 53, 55, 57 and 58
- Mexico Plants: 61, 63, 65, 66 and 68
- EMEASA Plants: 77, 78, 79 and 89
- India Plants: 84 (EPS Only)

1.1.2 APDL Equipment – Equipment purchases for the following Nexteer Asia Pacific Drive Line locations **ONLY**. All other plant locations are global equipment locations.

- China Plants: 52 and 54
- India Plants: 81, 83, and 84 (DL Only)

## 2. Specification Hierarchy

2.1 There are three (3) levels of specifications in the Nexteer Automotive hierarchy of Manufacturing Equipment Purchase Specifications in the following order of precedence.

2.1.1 The **Technical Purchasing Specification (T-Spec)** provides information specific to the equipment and process being purchased. Additionally, the T-Spec may also be used to clarify or provide guidance for deviations from individual Nexteer Automotive “SD” Specifications.

2.1.2 The **SD-2000 Series of Specifications** covers the basic requirements for a specific type of equipment, where applicable (e.g. draw furnace). The SD-2000 Series specifications take precedence over SD-000 in the event of a conflict between the two. The SD-2000 series specifications apply to APDL equipment **ONLY**.

2.1.3 The **SD-1000 Series of Specifications** covers the basic requirements for a specific type of equipment, where applicable (e.g. draw furnace). The SD-1000 Series specifications take precedence over SD-000 in the event of a conflict between the two. The SD-1000 series specifications apply to Global equipment **ONLY**. The SD-1000 series specifications do not apply to APDL equipment.

2.1.4 The SD-000 Series of Specifications covers the basic requirements for Custom Equipment.

2.2 Nomenclature in these specifications is as follows:

- Shall – indicates requirement
- Should – indicates recommendation
- May – indicates permission or allowance

### 3. Global Equipment Specification Requirements

The following specifications shall apply to this equipment unless otherwise amended. The latest revision is published on the Data Exchange website at [www.nexteerdatabase.com](http://www.nexteerdatabase.com) under Vendor Documents.

#### 3.1 Nexteer Automotive Global Machinery and Equipment Specifications

SD-001	General Manufacturing Equipment Specification
SD-002	Manufacturing Equipment Statistical Qualifications Requirements
SD-003	General Drawing and Manuals Specification
SD-004	Electrical Specification for Industrial Machinery
SD-005	General Gage Specification
SD-007	Approved Components List
SD-011	Specification for the Application of Safety Circuits
SD-012	Design-In Health and Safety Specification
SD-013	Hydraulic Fluid Power – General rules and safety requirements for systems and their components Addendum to ISO 4413
SD-014	Pneumatic Fluid Power – General rules and safety requirements for systems and their components Addendum to ISO 4414
SD-015	Lean Equipment Design
SD-016	Lean Equipment Controls Design
SD-017	Design-In Ergonomics Guideline
SD-018	Sound Level Specification (formally SL 1.0)
SD-019	Plant Sound Survey Specification (formally SL 2.0)
SD-020	Program For Occupational Hearing Conservation and Noise Control Specification (formally SL 3.0)

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### 3.2 Nexteer Automotive SD Equipment Specifications

SD-1000	Heat Resistant Alloy Castings
SD-1001	Furnace Heat Treat Equipment
SD-1003	General Specification for Induction Equipment
SD-1004	Solid State Inverter for Induction Equipment
SD-1006	Cooling Quench/Water System for Induction Equipment Water
SD-1009	Tumble Blast Equipment
SD-1010	Air Self-Cleaning Dust Collector
SD-1011	Vibratory Finisher for Deburring, Surface Finishing, Cleaning
SD-1013	Welding Machine Standards
SD-1013	Welding Machine Standards
SD-1014	Thermoplastic Mold Specification
SD-1015	Specifications for Mechanical Presses
SD-1019	CMM Program Purchase Specification
SD-1020	Human Machine Interface Application Specification
SD-1024	Low Temperature Box Ovens
SD-1031	Low Temperature Continuous Draw Furnaces
SD-1032	Programmable Logic Controller Application Specification
SD-1033	RFID Application Specification
SD-1036	ESD / Environmental Requirements for Electronic Assembly at Nexteer
SD-1037	ESD Requirements for Electronic Assembly Equipment and Part Handling in an EPA
SD-1038	Specification for the Application of Automatic Operator-Interface Safety Doors
SD-1039	Traceability Systems Bill of Process
SD-1040	Fanuc Robot Specification
SD-1041	CNC Lathe Program Structure Spec
SD-1042	CNC Mill Program Structure Spec
SD-1043	Requirement for Automated NDT Equipment
SD-1044	General Requirements for Factory Floor Magnetic Particle Inspection Equipment
SD-1045	Machine Ethernet Network Specification
SD-1047	Threaded Fastener Process Specification

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SD-1048	Servo Driven Pressing Systems
SD-1049	Specification for Data Matrix Marking
SD-1052	Machine Controls Traceability Interface Studio 5000
SD-1053	Studio 5000 Serial Generation
SD-1054	Studio 5000 JFK Lot Tracking (For use with Traceability Application v11.11.0 or newer and PLC JFK Routine v2.1.2 or newer)
SD-1055	Studio 5000 Tool Life (For use with Traceability Application v11.9.3 or newer and PLC Tool Life Routine v2.0.0 or newer)
SD-1056	Machine Controls Traceability Interface Siemens PLC (For use with Traceability Application v11.9.0 or newer and Siemens Logic v2.0.0 or newer)
SD-1058	Machine Controls Traceability Interface LabView TCP Adaptor
SD-1061	Machine Vision Application Requirements
<b>SD-1062</b>	<b>Machine Correlation Measurement ANOVA Method</b>

### 3.3 **International** Standards

IEC 60204-1	Electrical Standard for Industrial Machinery
<b>ISO 12100</b>	<b>General Principles for Design – Risk Assessment and Risk Reduction</b>
<b>ISO 13849-1</b>	<b>Safety-Related Parts of Control Systems – General Principles for Design</b>
ISO 4413	Hydraulic fluid power – General rules relating to systems
ISO 4414	Pneumatic fluid power – General rules relating to systems
RIA / ANSI R15.06	American National Standard for Industrial Robots and Robotic Systems – Safety Requirements

### 3.4 Industry Standards

GM 1720	GM Basic Lubrication Standard – LS1
GM 1721	GM Maintenance Standard – LS2
AIAG Measurement System Analysis Reference Manual	
AIAG Statistical Process Control (SPC) Reference Manual	

**NOTE: Users of this specification shall consult applicable Federal, State, Country, and Local laws, regulations, and standards in addition to those listed above. Reference the most current version of the specifications / standards listed above.**

## 4. APDL Equipment Specification Requirements

### 4.1 Nexteer Automotive APDL Only Machinery and Equipment Specifications

SD-003	General Drawing and Manuals Specification
SD-004	Electrical Specification for Industrial Machinery
SD-011	Specification for the Application of Safety Circuits
SD-012	Design-In Health and Safety Specification
SD-013	Hydraulic Fluid Power – General rules and safety requirements for systems and their components Addendum to ISO 4413
SD-014	Pneumatic Fluid Power – General rules and safety requirements for systems and their components Addendum to ISO 4414
SD-017	Design-In Ergonomics Guideline
SD-2007	APDL Approved Components List, Asia Pacific Drive Line
SD-2034	Machine Control Traceability Interface Specification, Asia Pacific Drive Line
SD-2040	ABB Robot Specification, Asia Pacific Drive Line
SD-2100	Process Label Print Systems, Asia Pacific Drive Line
SD-2101	Center of Failure Analysis, Asia Pacific Drive Line
SD-2103	Pack Out System, Asia Pacific Drive Line

#### 4.1.1 International Standards

IEC 60204-1	Electrical Standard for Industrial Machinery
ISO 12100	General Principles for Design – Risk Assessment and Risk Reduction
ISO 13849-1	Safety-Related Parts of Control Systems – General Principles for Design
ISO 4413	Hydraulic fluid power – General rules relating to systems, 2010 Edition
ISO 4414	Pneumatic fluid power – General rules relating to systems

NOTE: Users of this specification shall consult applicable Federal, State, Country, and Local laws, regulations, and standards in addition to those listed above. Reference the most current version of the specifications / standards listed above.

## 5. Specification Changes

Note: Minor revision level changes may appear in this section prior to formal release of a Nexteer Automotive SD Specification.

RECORD OF REVISIONS

Revision No	Date	Section	Description
001	30NO95	ALL	ORIGINAL APPROVAL & ISSUE DATE.
002	04AP97	3	Add modifications to SD-001, SD-002, and SD-004.
003	01MR99	2, 3	Revised version reference to SD-002 and GM Sound Level, Ergonomics, Vibration and Robot Standards / Specifications.
004	15AU99	2, 3	Revised version reference to several documents. The GM documents for Hydraulics, Pneumatics, Ergonomics, and Robots have been replaced with Delphi Automotive Systems, ISO, and RIA / ANSI standards.
005	07JA02	2	Revised referenced document revision dates and revised specification reference list.
006	01MR03	2, 3	Revised referenced document revision dates, revised specification reference list, and revised specification changes.
007	15OC03	2	Revised SD-002, SD-003, SL 1.0, and DEG revision dates.
008	15MY04	2	Revised SD-003 revision date.
009	15SE06	2	Revised revision dates for SD-001, SD-002, SD-003, SD-005, DA-2004, DA-2006, and DEG. SD-004 and SD-007 have been deleted. SD-007-NA, SD-1020, and SD-1022 have been added.
010	30MR07	2	SD-007 should have been SD-007-NA in 15SE06 revision.
011	15MY07	3	SD-001 specification changes – added Mexico plant utilities.
012	10NO08	2	Revised SD-002 revision date.
013	02FE09	2	Revised SD-002 revision date. Revised SD-005 revision date and moved from 2.25 to 2.4.
014	08JU09	2, 3, 4	Revised specification revision dates and added specification hierarchy section. Issued as global common specification and replaces SD-000 and all SD-000-xxx specifications.
015	06NO09	1, 2	Company name updated and “GC” removed from specification number. All SD documents are global common. All SD Specifications updated.
016	17DE10	2	Revised SD-000, SD-007, SD-012 revision dates and added reference to SD-1032, SD-1033, and SD-1034.
017	15OC12	2, 4	Revised SD-000, SD-001, SD-007, SD-1033 revision and added reference to SD-1035. Reference specification changes to Section 4.
018	27NO12	2	Revised SD-000 and SD-002.
019	04MR14	2	Revised SD-000, SD-001, SD-002, SD-011 revision and added reference to SD-1038.
020	30JU14	2	Revised SD-000, SD-001, SD-007, SD-013, SD-014, SD-1033, SD-1034, revision and added reference to SD-1039.
021	31JL14	2, 4	Revised SD-000, SD-004, SD-1020, SD-1032. Removed SD-004 modification for items 7.2.1 and 16.4 (50,000 amps).

022	10FE15	2	Revised SD-000, SD-017, SL 1.0.
023	16MA15	2	Revised SD-000, SD-003. Removed temporary SD-000 Specification changes adding Chongqing and Liuzhou sites. Sites are now in SD-003 Section 2.2.1 – 2.2.3.
024	23JL15	2	Revised SD-000, SD-002, and SD-004.
025	15OC15	2	Revised SD-000, SD-003, SD-007, and GM 1720.
026	15DE15	2	Revised SD-007 for corrections in Green Highlight.
027	13JA16	2	RE-written SD-1034 to Specification from Guideline.
028	01MY16	2	Revised SD-000, SD-002, and SD-003.
029	22AU16	2	Revised SD-003, SD-1035 obsoleted.
030	28FE17	2	Revised SD-007, SD-1032, and SD-1033.
031	27JL17	2	Revised SD-003.
032	04JU18	2	Revised SD-003.
033	28JU18	2	Updated SD-001, SD-003, SD-007, and SD-012.
034	12NO18	2	Updated SD-001 and SD-005.
035	11JA19	2	Updated SD-002.
036	03JN19	2	Updated SD-1034, added SD-1040.
037	10OC19	2	Updated SD-003
038	15NO19	2	Updated SD-001, SD-007
039	02MR20	4	Updated for SV OFF / SV Disable.
040	23MR20	2	Updated SD-017, added SD-1049
041	13MY20	1, 2, 3	Updated SD-015. Removed all revision level and added Data Exchange website publishing. Updated Specification Hierarchy.
042	09JN20	2, 4	Added SD-1045, updated Section 4.
043	22JA21	2	Added SD-018, removed SL 1.0 (replaced with SD-018).
044	27AU21	2	Added SD-1052, SD-1053, SD-1054, SD-1055, SD-1056, SD-1057 Removed SD-1034, SD-1039. Revised SD-1032.
045	07OC21	2	Added SD-1061. Removed SD-1022 (obsoleted). Added missing SD-1xxx specifications.
046	24OC23	2	Added SD-019 & SD-020 (previously SL2.0 & SL3.0)
047	05MR24	2	Added SD-1062.
048	05DE24	2,3,4	Incorporated APDL SD-2000 requirements into SD-000 section 4. Moved specification hierarchy to section 2.
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