



Machinery and Equipment Specification

Global Common

SD-000

ISSUED	November 30, 1995
REVISED	December 5, 2024

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Table of Contents

1.	Scope	3
2.	Specification Hierarchy.....	3
3.	Global Equipment Specification Requirements.....	4
4.	APDL Equipment Specification Requirements.....	7
5.	Specification Changes.....	8

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.nexteerdtaexchange.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)

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

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
SD-1062	Machine Correlation Measurement ANOVA Method

3.3 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
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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