

ASME B18 Digital Fastener Standard

The first ASME standard represented digitally

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55th SES Annual Conference



- A partnership between ASME and PARTsolutions has resulted in ASME B18.24 being represented in a digital form, as an interactive software tool
- This is the first standard to be represented digitally in ASME 125 year history
- This presentation introduces the standard and also the interactive software tool.

Content

- Who is PARTsolutions?
- Introduction of the ASME new PIN system
- Capabilities and Benefits of the Digital Library
- Demonstration
- Digital Product Catalog Technology



Who is PARTsolutions ?

- 15 years of industry specific experience
- Customers in over 30 countries
- 100% employee owned, no outside investors
- 150 employees and growing
- All product catalog development in-house
- 12 million+ downloads from our Digital Product Catalogs per year

SOLUTIONS FOR:

- Digital Parts Catalogs and Configurators
 - Online, CD, Print
- Online Communities for Component Manufacturers
 - ie: Autodesk Supplier Content Center
- Enterprise Parts Management
- Part Consolidation and Classification

PARTSOLUTIONS

Intelligent Parts
Management with
ERP/PDM integration



PARTWAREHOUSE

Parts Consolidation &
Geometrical Similarity
Search & Knowledge
Database



eCATALOGSOLUTIONS

Electronic product
catalog



PARTCOMMUNITY

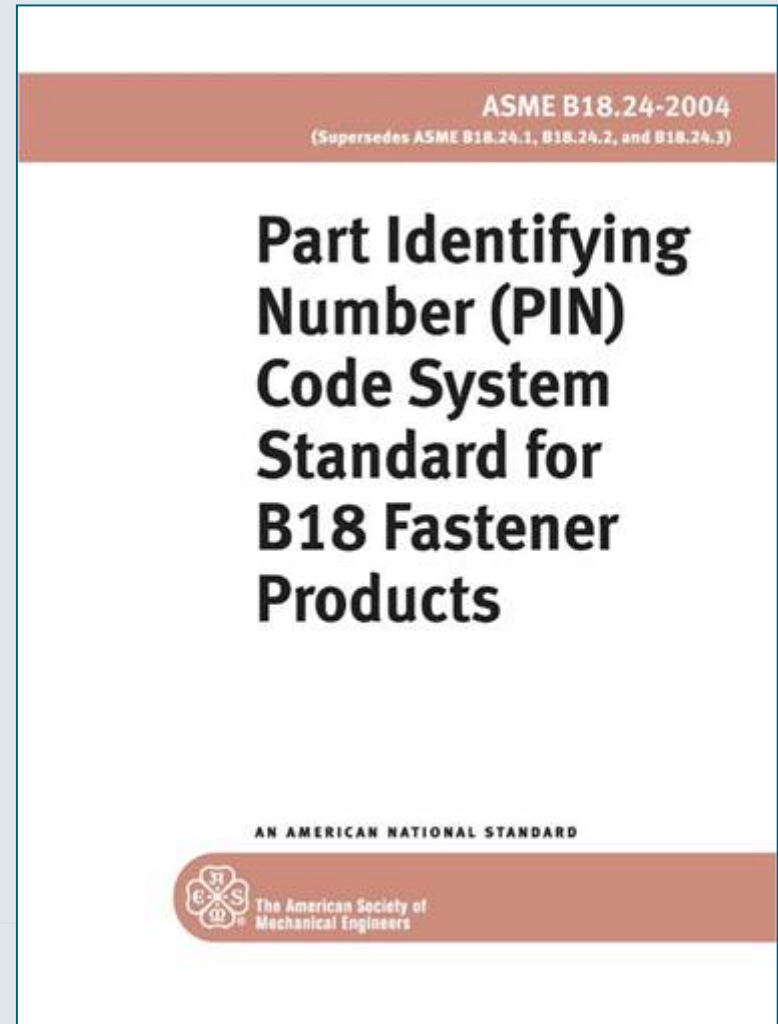
e-Engineering Portal
e-Shop



Introduction to the Standard

What is ASME B18.24?

- A numerical system for identifying fasteners, and all their characteristics
- It supercedes B18.24.1, B18.24.2, B18.24.3,
- **When is it effective?**
- ASME B18.24 was approved in April 2004, and is now in use
- Released in printed form in June 2005
- Adopted by DOD in August 2005
- Approved by ANSI



ASME B18.24 Adopted by DoD

Old Standards are Withdrawn

“The DOD has determined it no longer has an interest in...”

- B18.24.1
- B18.24.2
- B18.24.3

“...and is hereby withdrawing its adoption of this document as of 29 May 2006.”

New Standard is Adopted

- B18.24 Adopted

“...was adopted...for use by the Department of Defense...”

ASSIST Online

- Doc Analysis
- Doc Management
- Review Drafts
- DoD Contacts
- DoD Projects
- HAZMATs / ODCs
- DEIs
- PSAs
- ACP Analysis
- Qualification

• User Profile
• Report Library
• FAQs
• NGS Adopted
• Main Menu
• Logout

• DSP Home Page
• Shopping Wizard

Admin Modules

- User Feedback

Web: Jun 14, 2006 Database last updated: Jun 12, 2006 What's New? updated May 22, 2006

Document Analysis

Document Details - General

Document ID: ASME-B18.24.3 Scroll down to access document images.

Overview

Title: PART IDENTIFYING NUMBER (PIN) CODE SYSTEM STANDARD FOR B18 NORTHTHREADED PRODUCTS (NO S/S DOCUMENT)
Scope: Scope information has not been recorded for this document
Status: Withdrawn
Withdrawal Date: 29-MAY-2006
ESCI Area: S3GP
Dist. Stmt: A
Doc Category: ASME International

Responsibilities

| | | |
|---------------------------------------|--|--|
| Lead Standardization Activity: | IS | Defense Supply Center, Phil-General & Industrial Items of Supply |
| Adopting Activity: | AS | US Army Tank - Automotive Cnd, Armament Research Devlp & Engr Center |
| Coordination: | Full | |
| Army Custodian: | AS | US Army Tank - Automotive Cnd, Armament Research Devlp & Engr Center |
| Naval Custodian: | YD | Naval Facilities Engineering Command |
| Air Force Custodian: | YS | Air Force Materiel Command HQ |
| DIA Custodian: | | |
| Other Custodian: | | |
| Available From: | ASME International | |
| Address: | Three Park Avenue, New York, New York, 10016-5996, United States | |
| POC Info: | (800) THE-ASME | |
| NGS Site Email: | infocentral@asme.org | |

ADOPTION NOTICE

ASME B18.24, "PART IDENTIFYING NUMBER (PIN) CODE SYSTEM STANDARD FOR B18 FASTENERS", was adopted on 4 AUGUST 2005 for use by the Department of Defense (DoD). Proposed changes by DoD Activities must be submitted to the DoD Adopting Activity: Defense Supply Center Philadelphia, ATTN: DSCP-ITD, 700 Robbins Avenue, Philadelphia, PA 19111-5096. Copies of this document are available from the ASME, THREE PARK AVENUE, NEW YORK, NY 10016 (infocentral@asme.org).

ASME Promotion of the Standard

- ASME is promoting the new standard at tradeshows.
- Utilizing the Digital Fastener Library software tool to explain the PIN code system and it's benefits



National Manufacturing Week - Design Engineering Show

What is the Standard ?

Capability

- An 18 digit “Part Identifying Number (PIN) Code System Standard” for defining fasteners. The code defines these characteristics of a fastener:
 - Family and Type
 - Thread configuration
 - Fastener size
 - Length/other dimensions
 - Material and treatment
 - Finish and coating
 - Additional Features

Excerpt from the B18.24 document

| ASME B18.24 Fields | Base PIN | Thread Configuration | Fastener Size | Length/Other Dimensions | Material and Treatment | Finish and Coating | Features |
|---------------------------------------|----------------------------|-----------------------------|---------------|-------------------------|------------------------|---------------------|----------|
| 1 - Fastener Type / Base PIN | | | | | | | |
| 2 - Thread Configuration | | | | | | | |
| 3 - Fastener Size | | | | | | | |
| 4 - Length/Other Dimensions | | | | | | | |
| 5 - Material and Treatment | | | | | | | |
| 6 - Plating, Coating, and Passivation | | | | | | | |
| 7 - Additional Features | | | | | | | |
| 18 digit PIN | B18 Fastener Family & Type | Thread Configuration & Size | | Material/ Finish | | Additional Features | |
| AEB02C250A50AP4A11 | AEB02 | C | 250 A50 | AP4 | A1 | 1 | |
| B18 Fastener PIN Example | Field 1 | Field 2 | Field 3 | Field 4 | Field 5 | Field 6 | Field 7 |

PIN Code Number :
AES01CA12C25AP5A21

Benefit

- PIN number is accepted by all CAD systems, to ensure correct BOM and ordering
- Consolidates several previous standards
- Reduces errors when trying to explain fastener characteristics

Overview

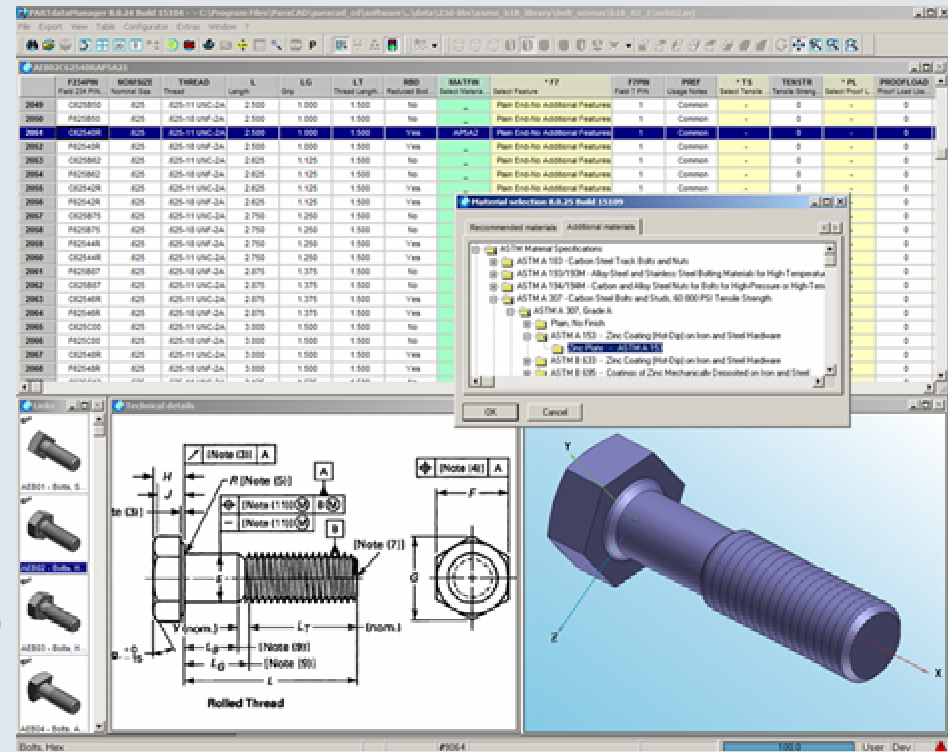
What is the Digital Fastener Library?

The Digital Fastener Library provides:

- Over 700 unique fastener types
- Up to 500 different configurations per type
- Material and heat treat specs from
 - ASTM, ISO, SAE, IFI, UNS

The result:

- Literally *Millions* of unique fasteners can be defined and their PIN codes generated or deciphered automatically
- The Library can provide users with a native CAD model with the precise PIN code in virtually any major CAD system
- Provides easy and immediate adoption of the new standard



The Digital Fastener Library is an interactive engineering tool

How is the library used?

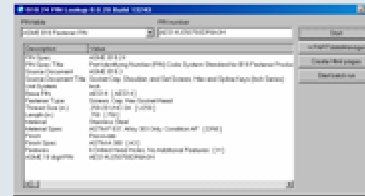
The Digital Fastener Library can be used in 2 distinct ways:

By anyone

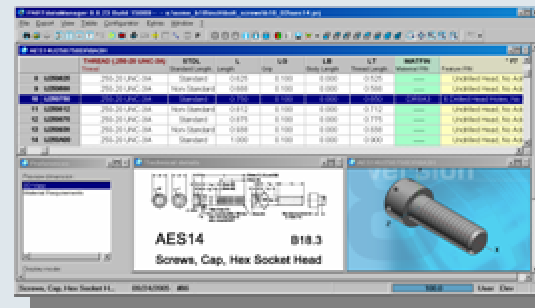
- ...to lookup PIN numbers and see the fastener characteristics and a 3D view. Useful outside the Engineering or the CAD department.

By Engineering

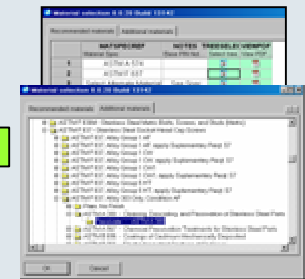
- ...to specify fasteners feature-by-feature, and let the Library produce the PINs, a 3D view, and the native CAD model.



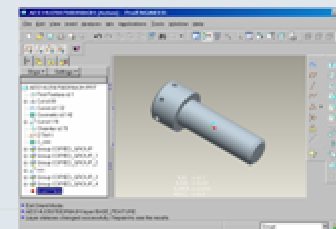
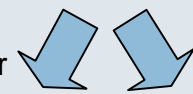
PINlookup Utility
(standalone, or feeds into fastener specification)



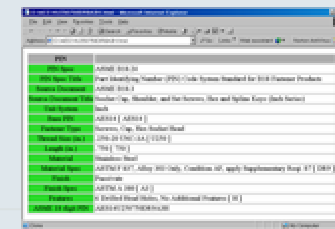
Fastener Specification
within PARTdataManager



Material and **Finish** selection



Export the 3D solid model to any CAD



Export the PIN and fastener characteristics

PIN Lookup Utility

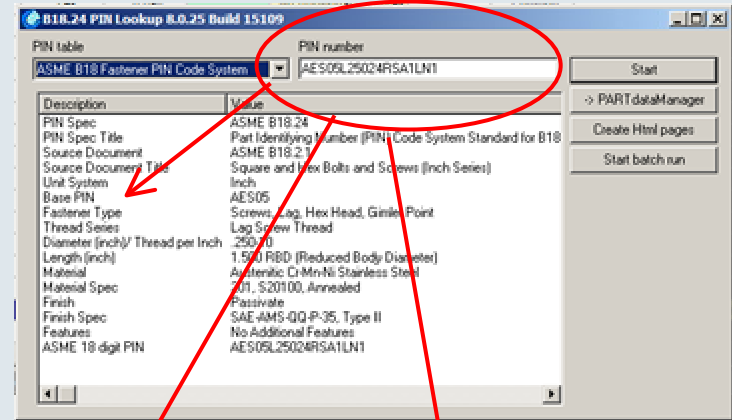
1. User enters a PIN

Capability

- Pin lookup utility that takes an old 24 digit PIN, or new 18 digit PIN, and automatically generates that fastener

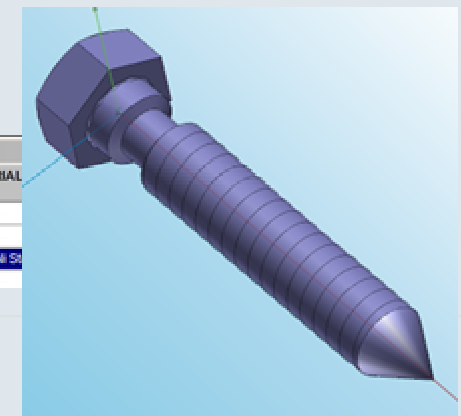
Benefit

- Generates and lists all the characteristics specified by the PIN
- Generates a 3D model so you can “see” the fastener. Rotate, pan, zoom, measure it or section it



| AES05L25024R5A1LN1 | | | | | | | | | | | | | |
|--------------------|---------------|--------------|---------|--------|---------------|-------|----------------|-----------------|------------------|------------------------|-------------|-------------|------------------------|
| | F234PIN | NOMSIZE | THREAD | L | LT | LG | RBD | SMMN | MATFIN | * F7 | F7PIN | PREF | MATERIAL |
| | Field 234 PIN | Nominal Size | Thread | Length | Thread Length | Orlp | Reduced Bod... | Shoulder Length | Select Matera... | Select Feature | Field 7 PIN | Usage Notes | Material |
| 198 | L25022R | .250 | .250-10 | 1.375 | 1.188 | 0.188 | Yes | 0.094 | - | No Additional Features | 1 | Common | - |
| 199 | L250A50 | .250 | .250-10 | 1.500 | 1.250 | 0.250 | No | 0.094 | - | No Additional Features | 1 | Common | - |
| 200 | L25024R | .250 | .250-10 | 1.500 | 1.250 | 0.250 | Yes | 0.094 | SA1LN | No Additional Features | 1 | Common | Austenitic Cr-Mn-Ni St |
| 201 | L250A62 | .250 | .250-10 | 1.625 | 1.313 | 0.313 | No | 0.094 | - | No Additional Features | 1 | Common | - |

2. The library delivers the details and the model



PIN Lookup Utility

Capability

- Send Fastener characteristics to others
- Publish to web pages or other sources

Benefit

- Understand the specifications of a fastener in a easy-to-read format
- Copy/Paste PIN numbers to avoid typing errors

| PIN | |
|-----------------------|--|
| PIN Spec | ASME B18.24 |
| PIN Spec Title | Part Identifying Number (PIN) Code System Standard for B18 Fastener Products |
| Source Document | ASME B18.6.3 |
| Source Document Title | Machine Screws and Machine Screw Nuts (Inch Series) |
| Unit System | Inch |
| Base PIN | AESD8 |
| Fastener Type | Screws, Machine, Flat Head, Undercut, Slotted |
| Thread Size (in.) | .250-28 UNF-2A [F250] |
| Length (in.) | .438 [438] |
| Material | Carbon Steel |
| Material Spec | SAE J 429 - Grade 2 [WA1] |
| Finish | Cadmium Plate |
| Finish Spec | ASTM B 766, Type I, Class 5 [B4] |
| Features | Plain End-No Additional Features [1] |
| ASME 18 digit PIN | AESD8F250438WA1B41 |

Sample Web page output

Define a Fastener

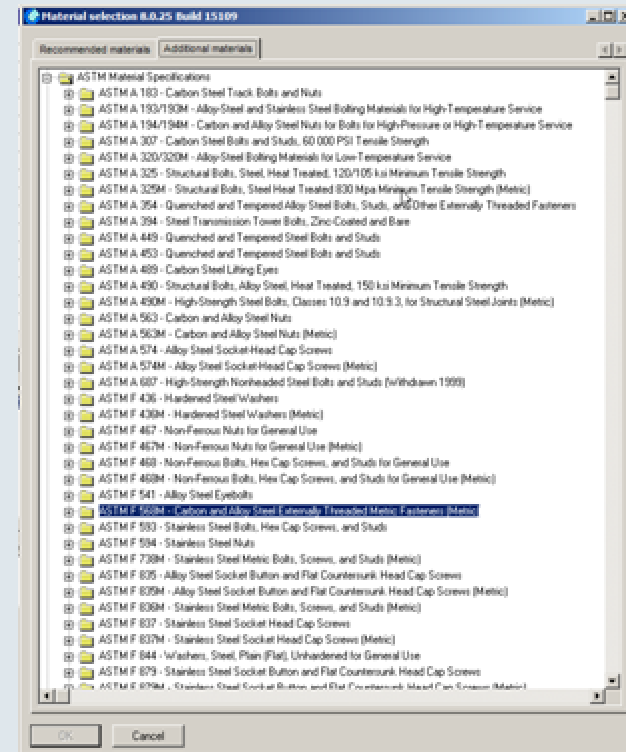
ASTM Material Specifications Table – Top Level

Capability

- Comprehensive table of fastener characteristics appropriate for each type. Automatically builds up the fastener.
 - Nominal size, thread type, lengths, tensile strengths, finish specs, material specs, all head characteristics, special end types, radii, tolerances, etc
 - ASTM material specifications

Benefit

- Easy, multiple-choice selection of characteristics needed for the fastening task at hand



| | F234PIN Field 234 PIN... | NOM SIZE Nominal Size | THREAD Thread | L Length | LG Grip | LT Thread Length... | RBD Reduced Bod... | MATFIN Select Matera... | * F7 Select Feature | F7PIN Field 7 PIN | PREF Usage Notes | * TS Select Tensile | TENSTR Tensile Streng... | * PL Select Proof L... | PROOFLOAD Proof Load Lbs... |
|------|-----------------------------|--------------------------|------------------|-------------|------------|------------------------|-----------------------|----------------------------|----------------------------------|----------------------|---------------------|------------------------|-----------------------------|---------------------------|--------------------------------|
| 2049 | C625B50 | .625 | .625-11 UNC-2A | 2.500 | 1.000 | 1.500 | No | — | Plain End-No Additional Features | 1 | Common | - | 0 | - | 0 |
| 2050 | F625B50 | .625 | .625-18 UNF-2A | 2.500 | 1.000 | 1.500 | No | — | Plain End-No Additional Features | 1 | Common | - | 0 | - | 0 |
| 2051 | C62540R | .625 | .625-11 UNC-2A | 2.500 | 1.000 | 1.500 | Yes | — | Plain End-No Additional Features | 1 | Common | - | 0 | - | 0 |
| 2052 | F62540R | .625 | .625-18 UNF-2A | 2.500 | 1.000 | 1.500 | Yes | — | Plain End-No Additional Features | 1 | Common | - | 0 | - | 0 |
| 2053 | C625B50 | .625 | .625-11 UNC-2A | 2.500 | 1.000 | 1.500 | No | — | Plain End-No Additional Features | 1 | Common | - | 0 | - | 0 |

Portion of Fastener Specifications Table

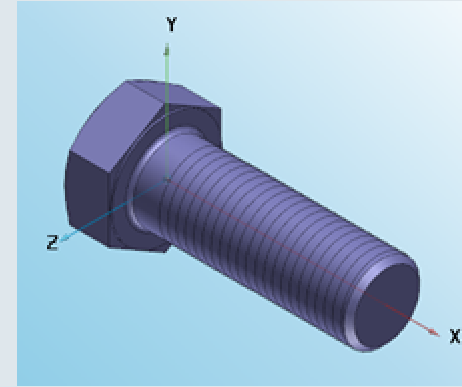
The 18 Digit PIN is Generated

Capability

- Automatic generation of the new 18 digit PIN number for the fastener defined.

Benefit

- Calculated automatically; reduces errors when trying to assemble the number manually
- PIN number is imported into each CAD system also, to ensure correct BOM and ordering.



AEB02C250A50AP4A11

| ASME B18.24 Fields | Base PIN | Thread Configuration | Fastener Size | Length/Other Dimensions | Material and Treatment | Finish and Coating | Features |
|------------------------------|----------------------------|-----------------------------|-----------------------------|----------------------------|---------------------------------------|-------------------------|----------|
| 1 - Fastener Type / Base PIN | 2 - Thread Configuration | 3 - Fastener Size | 4 - Length/Other Dimensions | 5 - Material and Treatment | 6 - Plating, Coating, and Passivation | 7 - Additional Features | |
| 18 digit PIN | B18 Fastener Family & Type | Thread Configuration & Size | | Material/Finish | Additional Features | | |
| AEB02C250A50AP4A11 | AEB02 | C | 250 A50 | AP4 A1 | 1 | | |
| B18 Fastener PIN Example | Field 1 | Field 2 | Field 3 | Field 4 | Field 5 | Field 6 | Field 7 |

Excerpt from B18.24

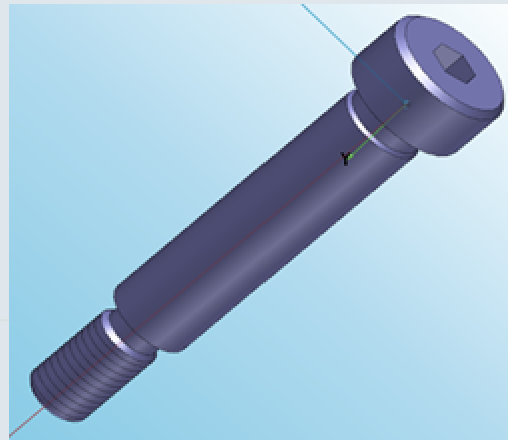
Automatic 3D Model Generation

Capability

- Automatic generation of a dynamic 3D model of the defined fastener for visual verification. The Library can then provide a *native* CAD model in virtually any CAD system. Over 85 formats are possible.

Benefit

- Virtually all major CAD systems get a *native* model, so you get the correct, complete part in your CAD system
- The 18 digit PIN travels with the part into your CAD, so BOM and ordering are ensured



Native
Inventor
AutoCAD
Pro/Engineer
Unigraphics
UG-NX
I-deas
SolidEdge
SolidWorks
Catia V4
Catia V5
...more

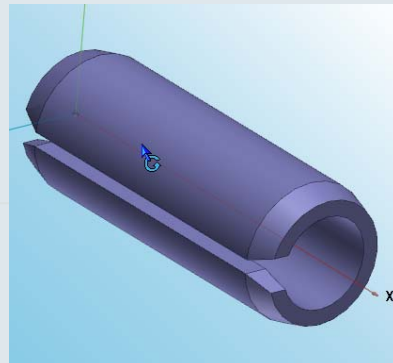
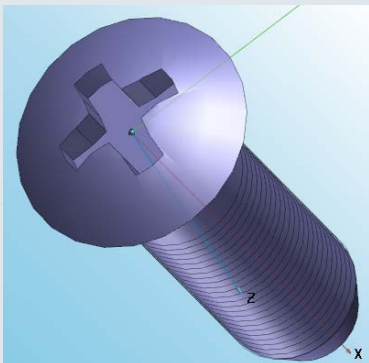
PIN Converter Utility

Capability

- A converter that will take old 21 digit PINs and automatically create the new 18 digit format
- The library delivers the specifications and the 3D model

Benefit

- Eliminates the manual 12 step process using conversion tables
- Ensures accuracy
- Makes transition to the new standard easy



NONMANDATORY APPENDIX A

B18.24.1, B18.24.2, B18.24.3

PIN SUCCESSION INSTRUCTIONS

These instructions are meant for use with the worksheet in Fig. A-1. Following that is a 21-digit PIN succession example.

- (1) Enter cancelled 21 digit PIN.
- (2) Demarcate digit 1 (field 1) PIN.
- (3) Based on resolved logic for digit 1, enter the applicable "next table" value in cell A2 and the "table pg#"
value in cell C2.
- (4) Demarcate the next 6 or 7 digits (field 2 value) as applicable from "next length" value in cell A2.
- (5) Enter field 2 PIN21 value into cell B2.
- (6) Look up cell B2 PIN21 value in Table B-2 or B-3, as applicable. Enter resolved PIN18 value into cell D2.
- (7) Enter table references by listing them vertically into worksheet beginning from cell A3. Use the simpler "Bxxx" format (table-field length) e.g., B136-1 rather than the "[B-xxx]-x" format in Tables B-2 and B-3. For example, [B-136] 1.
- (8) Demarcate remaining fields according to "next length" values starting from cell A3 downward.
- (9) Enter remaining demarcated field values by listing them vertically from cell B3 downward.
- (10) Enter the page numbers vertically beginning from cell C3 downward.
- (11) Look up PIN18 values for tables listed in column A starting from A3 downward. Enter PIN18 values into column D.
- (12) Transpose vertical PIN18 values from column D horizontally to "A1" entry field at bottom of worksheet. This resolves the cancelled B18.24.1-3 PIN to a superseding 18 digit B18.24 PIN.

PIN Conversion 12-step Instructions



Enter cancelled 21 digit PIN

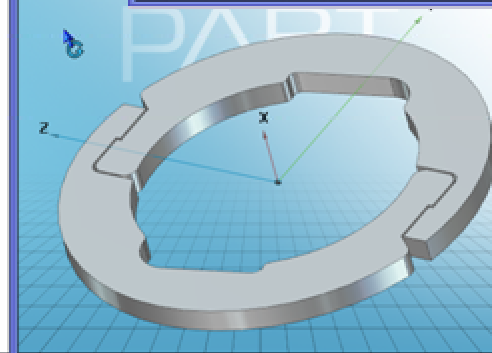
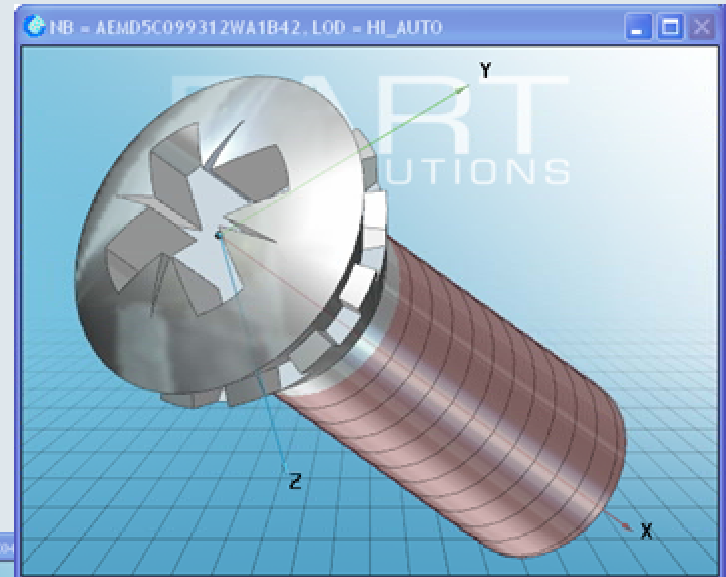
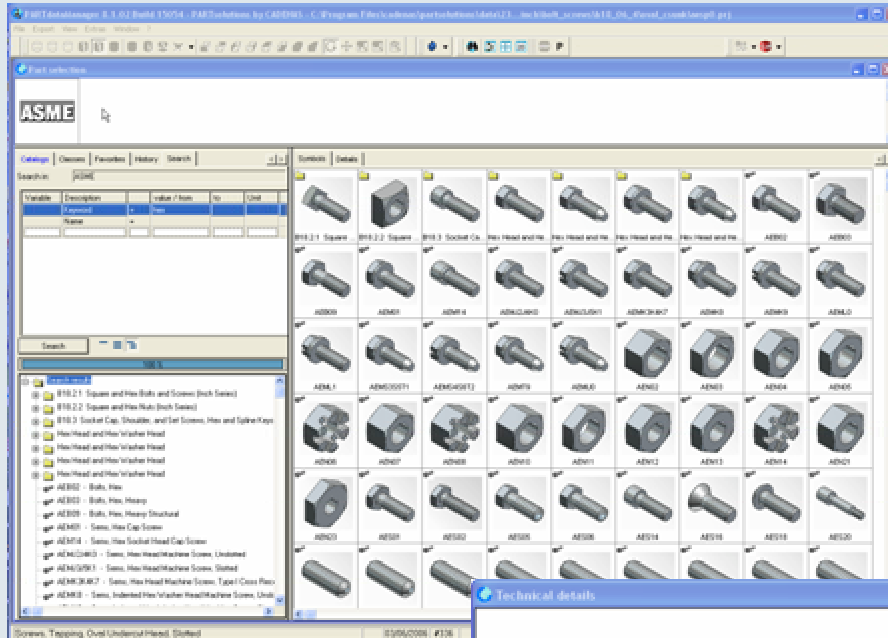
if digit 1 above = **B, M, S, or T**
then cell A2 below has a value of **B2-7**

if digit 1 above = **E, N, P, R, V, or W**
then cell A2 below has a value of **B3-6**

| | A | B | C | D |
|---|---------------------------|----------------|------------------|---------------|
| | next—next table—length | PIN21 | table pg. no. | PIN18 |
| 1 | B 2-7 | 210NA01 | | AE B03 |
| 2 | B 4-1 | C | | |
| 3 | B 6-2 | AD | | |
| 4 | B 11-2 | 16 | | |
| 5 | B 134-5 | 468GA | | |
| 6 | B 136-2 | AB | | |
| 7 | B 137-1 | 1 | | |

PIN Conversion Step/Table #9

Demonstration

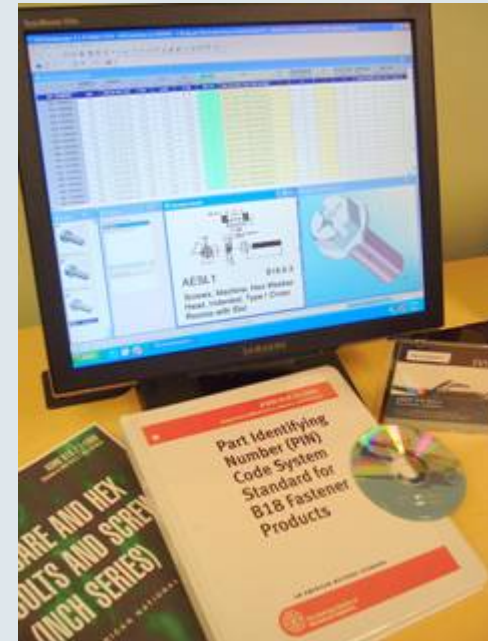


The new Standard

- Simplifies fastener specifications
- The PIN code is designed for CAD systems to use

The Digital Fastener Library

- Easy - Makes it possible for anyone to decipher a PIN
- Accurate – automatically builds the PIN
- Time savings = cost savings



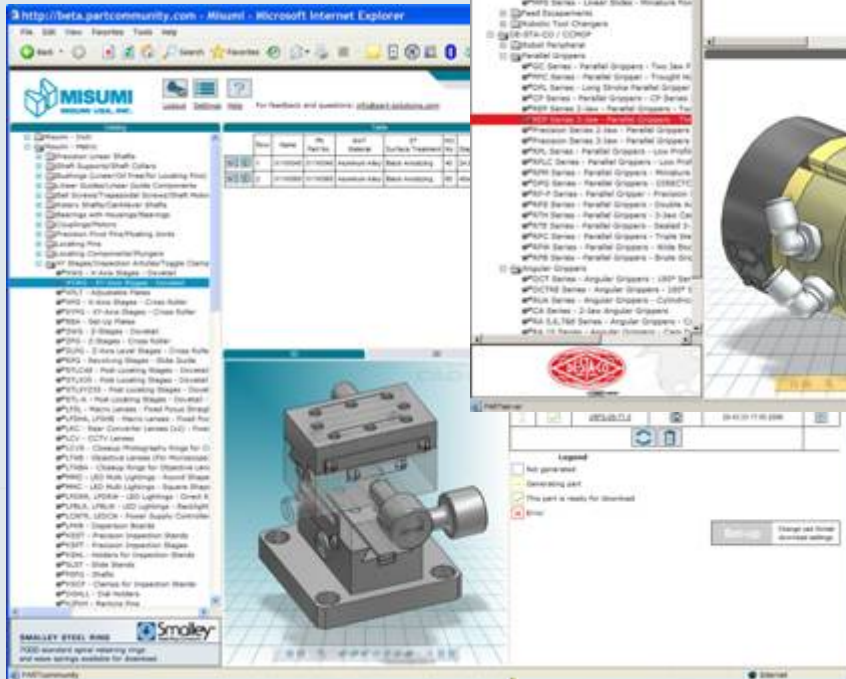
PARTsolutions Technology

Other Digital Product Catalogs...

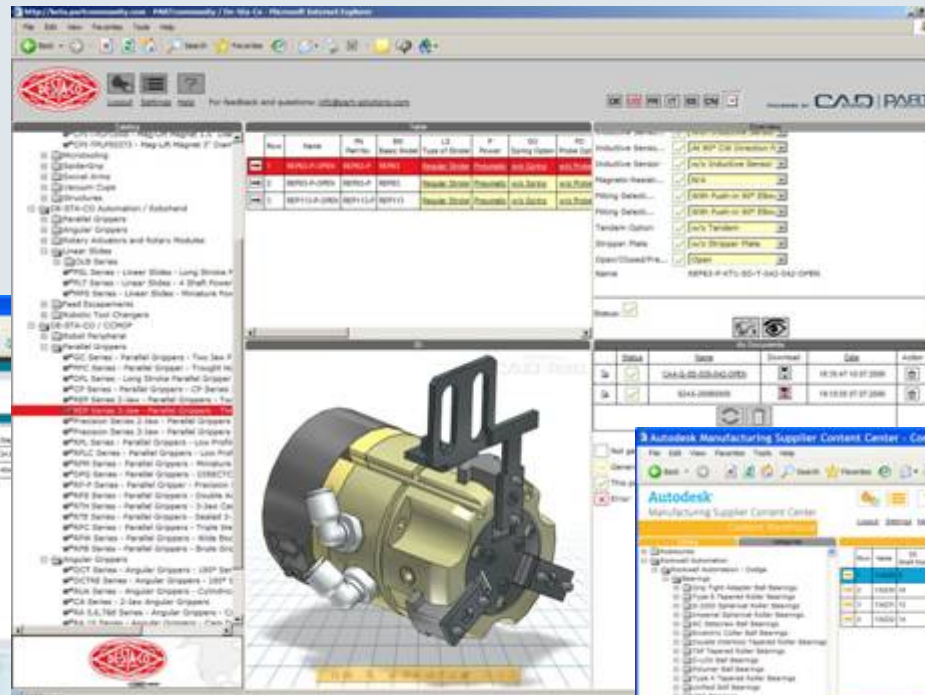


Digital Product Catalogs and Configurators allow companies to provide their products digitally and accurately to designers worldwide, providing a service that differentiates the competition and gets products specified

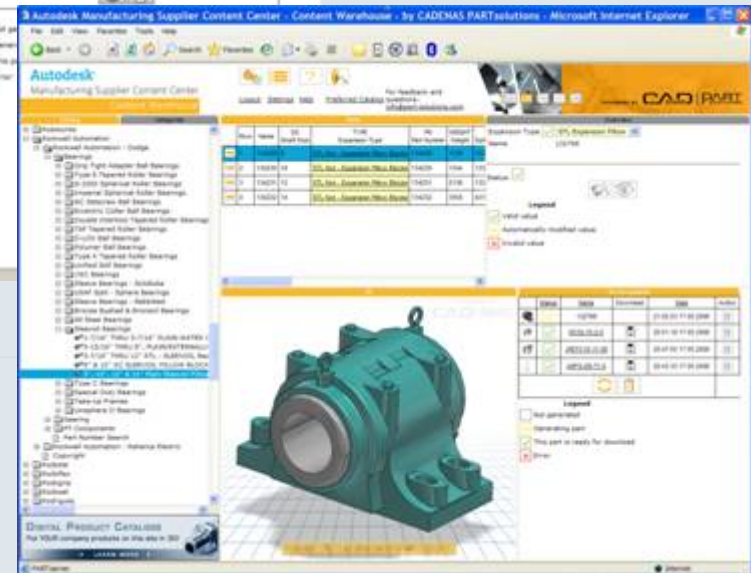
Misumi



De-Sta-Co



Rockwell Automation



- **ASME B18 Digital Fastener Library**
 - asme@part-solutions.com
- **Intelligent Parts Management**
- **Digital Parts Catalogs**



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