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P3-A Education Program

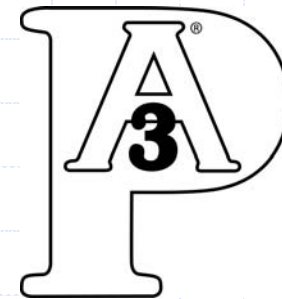
May 17, 2010



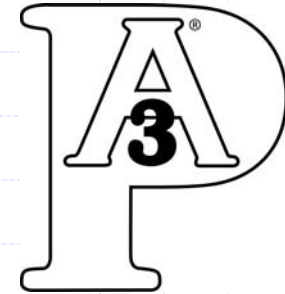
Welcome

P3-A Education Program

**Milwaukee, Wisconsin
May 17, 2010**



P3-A Education Program



P3-A Standards in the Marketplace

**Standards for the Manufacture of
Pharmaceutical Products**

**Polymer Materials in API Production
Equipment**

P3-A Education Program



Our Thanks and Appreciation

- ◆ P3-A Steering Committee
- ◆ Speakers
- ◆ Sponsors



Thank You Sponsors!



Gamajet Cleaning Systems, Inc.
www.gamajet.com



Walker Engineered Products
www.walkerep.com

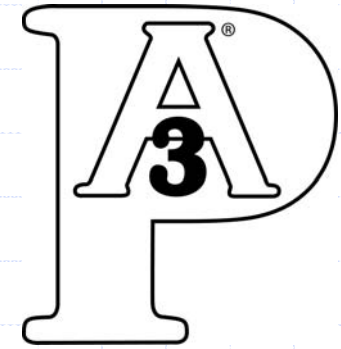


G-M-I, Inc.
www.gmigaskets.com

P3-A Steering Committee



Chair, Paul Gold
Pfizer Global Manufacturing
Services



P3-A Standards in the Marketplace



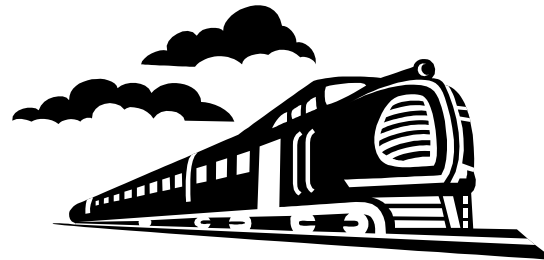
The Origins of P3-A

- ◆ **Organized in 2003**
- ◆ **First new American National Standards introduced in 2008**



P3-A Pharmaceutical Equipment Standards

**Collaborating on industry-wide
pharmaceutical equipment standards.**



The Origins of P3-A

- ◆ **Increased scrutiny on API Manufacturing in recent years drove the need for Cleaning Validation of API Equipment.**
- ◆ **It is costly for each company to have API equipment manufacturers make specific changes to make equipment easier to clean – is there a consensus on required changes?**

The Origins of P3-A

- ◆ No suitable industry standards existed for the design of cleanable API Equipment.
- ◆ The Existing 3-A Standards (dairy) were not suitable for most API Equipment.
- ◆ The ASME BPE Standards were not suitable for many types on API Equipment.

The Origins of P3-A

- ◆ Existing benchmarking effort across several API manufacturers was expanded to include the formal development of Standards for Cleanable Design of API equipment.
- ◆ Started working with 3A-SSI as the umbrella organization for the Standards development.

The Origins of P3-A

- ◆ **Formation of new P3-A Steering Committee to operate within 3-A SSI**
- ◆ **Development of Mission Statement to define purpose and objectives of activity.**

P3-A Steering Committee

Mission Statement:

The P3-A Pharmaceutical Equipment Standards Steering Committee is responsible for overseeing standardization activities for P3-A standards for pharmaceutical industry use in the domestic and international fields.

The Committee is responsible for supervising all work in the development of technical standards for pharmaceutical industry equipment within P3-A SSI and in cooperation with other organizations.

P3-A Steering Committee

Project Plan/Approach

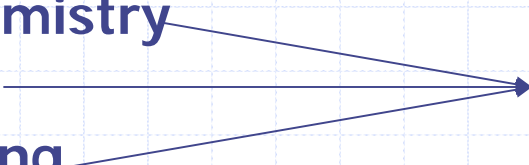
“Begin with the end in mind”

Three Stages

Follow the Pharmaceutical Process Schema

- **Active Pharmaceutical Ingredient (API) synthesis/isolation**
- **API conversion to dosage form**
- **Final Packaging**

P3-A Steering Committee

- **API Production**
 - ◆ Synthetic chemistry
 - ◆ Fermentation
 - ◆ Isolation/sizing
 - ◆ Limited equipment sets – easier to standardize
 - **Dosage forms**
 - ◆ Tablet or capsule
 - ◆ Liquid solution or suspension
 - ◆ Semi-solids (cream, ointment, gel)
 - ◆ Sterile ophthalmic
 - ◆ Sterile Injectable
 - ◆ Inhaled powders
- Containment**
- 

The future holds great promise

Why not use ASME BPE Standards?

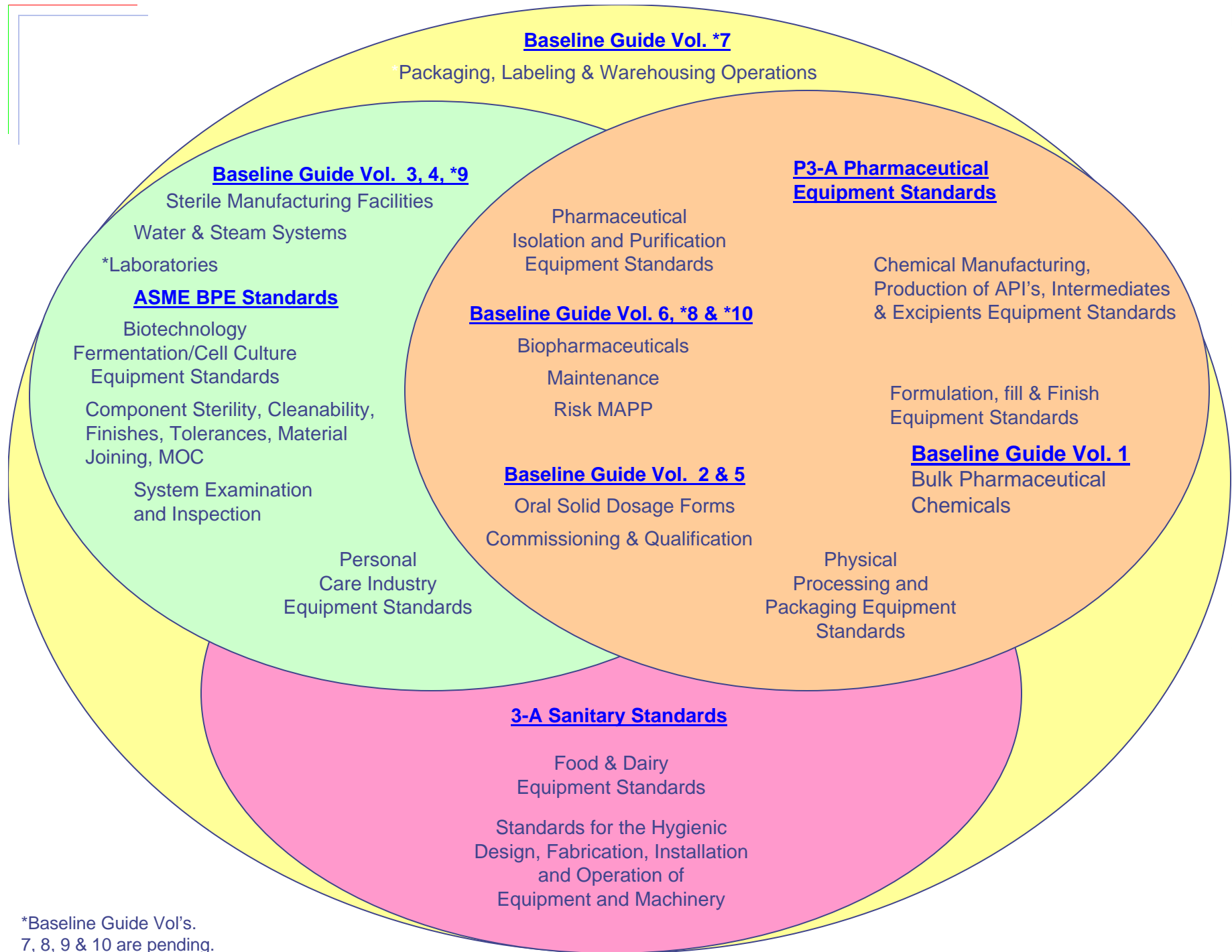
ASME BPE Standards deal with the requirements of the bioprocessing, pharmaceutical, and personal care product industries as well as other applications with relatively high levels of hygienic requirements, covering directly or indirectly the subjects of materials, designs, fabrication, pressure systems (vessels and piping), examinations, inspections, testing, and certifications.

The Scope of P3-A Standards

- ◆ In general, chemical pharmaceutical manufacturing involving small molecule manufacturing and purification.
- ◆ These processes are often solvent based, or operates at highly acidic or basic pH conditions that inhibit microbial growth and contamination.
- ◆ Sterile and aseptic design is less critical.

What is Excluded from P3-A Scope?

- ◆ In general, biopharmaceutical manufacturing involving large molecule manufacturing and purification.
- ◆ These processes are often aqueous based operating at pH conditions which do not inhibit microbial growth and contamination.
- ◆ Hygienic design is critical. Includes high purity water and clean steam systems.



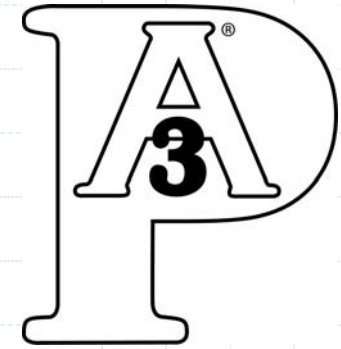
*Baseline Guide Vol's.
7, 8, 9 & 10 are pending.

Benefits of Standardization & Collaboration

- Lower cost of Standards development by using 3-A Dairy Standards as the starting point. There are 52 related equipment types, with cleanability and sanitary design requirements already included.
- Decrease in equipment costs when vendors build to a single standard.
- Decrease in capital project specification time and costs by having a strong starting point for the process.
Increased compliance with sanitary codes and principles, including internal Quality Standards.

Benefits of Standardization & Collaboration

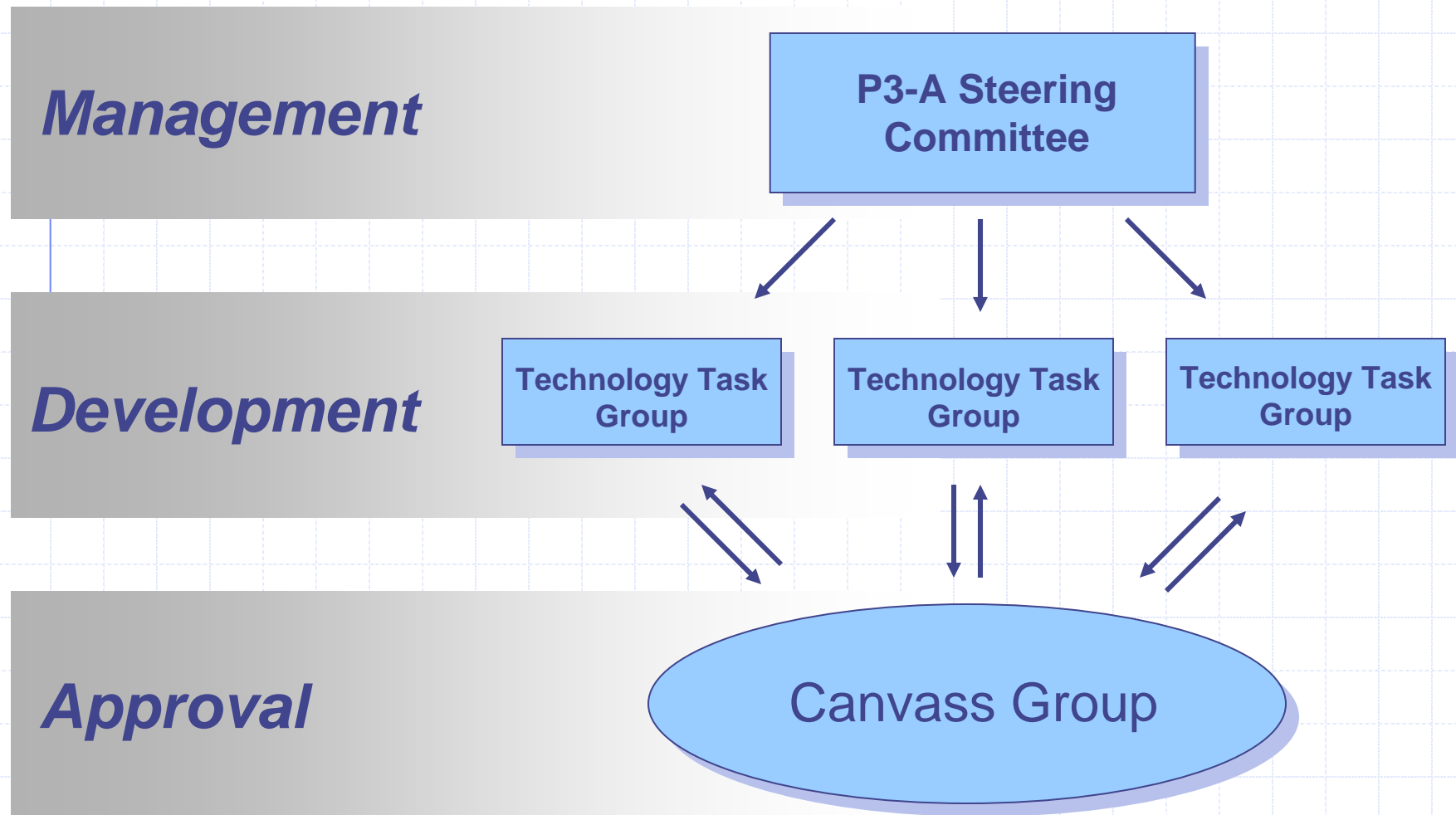
- Presentation of a “unified front” within the pharmaceutical industries will assure the compliance and cooperation of equipment vendors.
- 3-A SSI already has working relationships with the FDA, USDA, and other regulatory agencies.
- 3-A SSI’s Third Party Verification program will enhance acceptance by inspection authorities.
- American National Standards (ANSI) applied across site locations.



Current P3-A Standards



Organizational Structure - Overview



Organizational Structure - Overview



**Pharmaceutical 3-A® Standards
By 3-A Sanitary Standards, Inc.
an ANSI Accredited Standards
Developer**

P3-A-001 TERMINOLOGY

ANSI/3-A P3-A 001-2008 General Glossary of Terminology Used in Pharmaceutical 3-A® Standards

**FINAL BSR ACTION – Published March 7,
2008**

P3-A-001 TERMINOLOGY

❖ FOUNDATION DOCUMENT TO BE REFERENCED BY ALL SUBSEQUENT STANDARDS

❖ ALLOWS DOCUMENTS TO FOCUS ON DESIRED TOPICS

❖ REFINES FOCUS ON API RELATED LEXICON INCLUDING DEFINITIONS AND ACRONYMS

P3-A-001 TERMINOLOGY

- ❖ UTILIZES CERTAIN TRADITIONAL 3-A DEFINITIONS WITH APPROPRIATE REFINEMENTS (i.e. Product is API)
- ❖ WILL BE AMENDED AS NEEDED TO ACCOMMODATE FUTURE STANDARDS

P3-A-002 MATERIALS

**ANSI/3-A P3-A 002-2008
Pharmaceutical 3-A® Sanitary/Hygienic
Standards for Materials for Use in
Process Equipment and Systems**

**FINAL BSR ACTION – Published February 29,
2008**

P3-A-002 MATERIALS

- ❖ **FOUNDATION DOCUMENT TO BE REFERENCED BY ALL SUBSEQUENT STANDARDS**
- ❖ **ALLOWS DOCUMENTS TO FOCUS ON DESIRED TOPICS**
- ❖ **REFINES FOCUS ON API MANUFACTURING NEEDS AND ENVIRONMENT OF INTENDED USE**

P3-A-002 MATERIALS

❖ REFERENCES ICHQ7 (GMP Guidance for API Manufacturing)

❖ EMPHASIZES MATERIALS SELECTION SHALL CONSIDER THE ENVIRONMENT OF INTENDED USE

❖ DOCUMENT IS A BASELINE TO BEGIN THE MATERIALS SELECTION PROCESS

P3-A-002 MATERIALS

- ❖ FINAL SURFACE FINISH CRITERIA WILL BE SPECIFIED IN THE EQUIPMENT STANDARDS**
- ❖ FINAL MATERIALS PERFORMANCE REQUIREMENTS ARE SPECIFIED IN THE EQUIPMENT STANDARDS**
- ❖ STANDARD COMBINES METALS, PLASTICS, CERAMICS, SYNTHETICS, ADHESIVES, LUBRICANTS IN SINGLE DOCUMENT**

P3-A-003 PUMPS

**ANSI/3-A P3-A 003-2008
Pharmaceutical 3-A® End Suction
Centrifugal Pumps for Active
Pharmaceutical Ingredients**

**FINAL BSR ACTION – Published August 1,
2008**

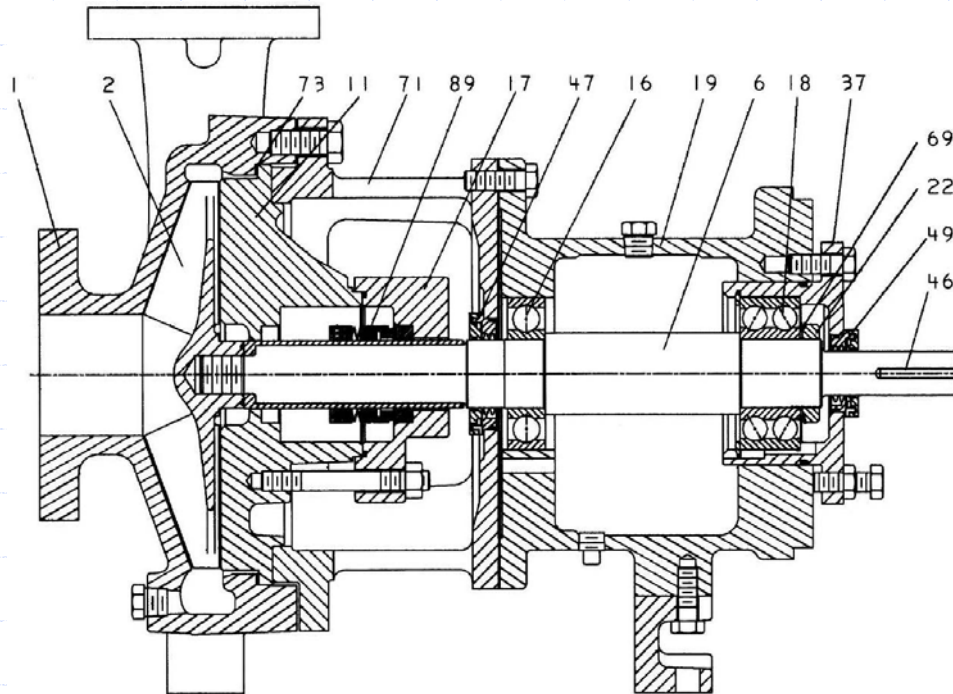
P3-A-003 PUMPS

❖ PROVIDES FABRICATION CRITERIA FOR END SUCTION CENTRIFUGAL PUMPS BASED UPON ANSI B73.1 SPECIFICATIONS

- ANSI B73.1 ASSURES INTERCHANGEABILITY BASED UPON DIMENSIONAL SPECIFICATIONS**
- ADDS SPECIFIC API SERVICE COMPATIBLE CRITERIA**
- UTILIZES P3-A BASE DOCUMENTS**

P3-A-003 PUMPS

ANSI B73.1 PUMP EXAMPLE



- | | | | |
|----|---------------------|----|-------------------------------|
| 1 | Casing | 37 | Cover, bearing, outboard |
| 2 | Impeller | 46 | Key, coupling |
| 6 | Shaft, pump | 47 | Seal, bearing cover, inboard |
| 11 | Cover, seal chamber | 49 | Seal, bearing cover, outboard |
| 16 | Bearing, inboard | 69 | Lockwasher |
| 17 | Gland | 71 | Adapter |
| 18 | Bearing, outboard | 73 | Gasket |
| 19 | Frame | 89 | Seal |
| 22 | Locknut, bearing | | |

P3-A-003 PUMPS

- ❖ DEFINES ACCEPTABLE MATERIALS AND FINISHES FOR PRODUCT CONTACT SURFACES**
- ❖ DEFINES MECHANICAL SEAL DESIGN CRITERIA & ALLOWABLE MOUNTING METHODS**
- ❖ DEFINES ALLOWABLE LUBRICANTS AND ADHESIVES**
- ❖ RECOGNIZES POTENTIAL IMPACT OF PUMP CONSTRUCTION TO MAINTAINING PRODUCT QUALITY**

P3-A-003 PUMPS

PROVIDES PUMP PROCUREMENT & DESIGN GUIDANCE

P3-A Centrifugal Pump Data Sheet

*SERIAL NUMBER:									
1	GENERAL INFORMATION					MATERIALS			
2	SERVICE:					CASING:			
3						IMPELLER:			
4	DUTY:	CONTINUOUS	INTERMITTENT			SHAFT:		SHAFT SLEEVE:	
5	(PLEASE CIRCLE ONE)					MOUNTING BASE (MATERIALS):			
6						PRODUCT CONTACT SURFACE FINISH (R _v μin Ra (1.6 μm Ra))			
7	PROCESS INFORMATION					GASKETS:			
8	LIQUID:					O-RINGS:			
9	BOILING	TOXIC	FOAMING	FLAMMABLE	CONSTRUCTION				
10	DESIGN FLOW:	MIN	NORMAL	MAX	GPM	SIZE	RATING	(CIRCLE)	
11	PUMPING TEMP. RANGE (PROCESS):				*F	*SUCTION CONNECTION		RF	FF
12	SP. GR. @ PUMPING TEMP.:					*DISCHARGE CONNECTION		RF	FF
13	VISC. @ PUMPING TEMP.:				CPS	DRAIN CONN.: (1/2" STANDARD)			
14	VAPOR PRESS. @ PUMPING TEMP.:				(PSIA)(mmHg)				
15	CORROSIVE MAT'L:				pH VALUE:	*CASING DESIGN PRESSURE:		PSIG @	*F
16	SOLIDS (MAX. DIAM.):				% BY WEIGHT:				
17	CIP/SIP: (PLEASE CIRCLE ONE)				*IMPELLER SIZE: MAX:				
18	ABRASIVE NON-ABRASIVE								
19	(PLEASE CIRCLE ONE)				MATERIAL CERTS REQUIRED:		YES	NO	
20	HYDRAULIC INFORMATION				FT. LIQ.	MATERIALS CERTIFICATES OF CONFORMANCE: YES NO			
21	SUCTION PRESS. ABOVE LIQ. (ABS)(+)								
22	STATIC SUCTION LIFT (-) HEAD (+)				COOLING/HEATING/PIPING PLAN:				
23	SUCTION FRICTION (-)								
24	TOTAL SUCTION HEAD (21+22+23)				BEARINGS: TYPE G.F.L. GREASE: (ZERK) OIL FLOOD				
25	STATIC DISCHARGE HEAD (+)				*BEARING MFG I.D. NO: THRUST RADIAL				
26	DISCHARGE FRICTION HEAD (+)								
27	DISCHARGE PRESS. ABOVE LIQ. (ABS)(+)				BASEPLATE: MFG STANDARD OTHER				
28	TOTAL DISCHARGE HEAD (25+26+27)								
29	TOTAL DYNAMIC HEAD (28-24)				*WEIGHT: PUMP BASE MOTOR				
30	NPSH AVAILABLE				DRIVE				
31	*NPSH REQ'D NORMAL MAX				FURNISHED BY: VENDOR OTHER				
32	*SEAL CHAMBER PRESSURE				TYPE:				
33	PUMP				MANUFACTURER:				
34	*MANUFACTURER:				ENCLOSURE:		INSUL:		
35	*MODEL: CURVE RPM:				Hp:		RPM:	FRAME:	
36	*BHP @ SERVICE CONDITIONS:				VOLTS:		PHASE:		CYCLE:
37	*BHP @ MAX FLOW FOR IMPELLER (N.O.L.):				*BEARING MFG I.D. NO: FRONT		REAR		
38					LUBRICATION:				
39	*PERF. CURVE: PSIG				COUPLING TYPE:		OSHA GUARD:		
40	*SERIAL NO.:				COUPLING MFG:		MODEL:		
41	*NOTES:								
42									

* VENDOR TO SUPPLY INFORMATION WITH QUOTATION

P3-A-003 PUMPS

PROVIDES SEAL PROCUREMENT & DESIGN GUIDANCE

P3-A Pump Seals Data Sheet

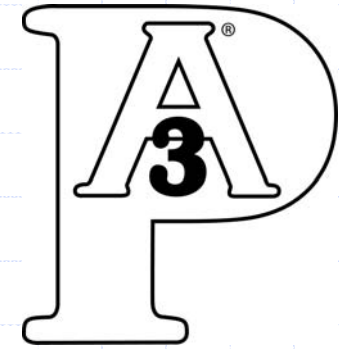
SEALS DATA SHEET

REV.

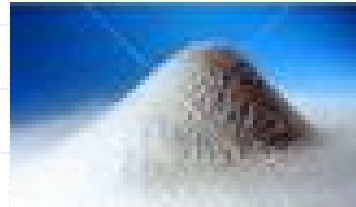
DATE

COMPANY _____	PROJ. NO. _____	SHEET _____ OF _____
LOCATION _____	P.O. NO. _____	SPEC. NO. _____
CHECKED BY _____ DATE _____	EQUIPMENT NO. _____	
COMPUTED BY _____ DATE _____	TOTAL NO. REQ'D. _____	
1	GENERAL INFORMATION	
2	SEAL TYPE: SINGLE DUAL UNPRESSURIZED DUAL PRESSURIZED COMPONENT/CARTRIDGE	
3	SEAL MFG:	
4	*SEAL MODEL:	
5	*SEAL CODE:	
6	PIPING PLAN:	
7	SHAFT DIAMETER (IN):	
8	BARRIER FLUID CONNECTIONS: THREADED FLANGE SANITARY CLAMP	
9	PRODUCT CONNECTIONS: THREADED FLANGE SANITARY CLAMP NONE	
10	PRODUCT CONTACTING MATERIALS	
11	SEAL FACES: / ROTATING/STATIONARY.	
12	SEAL HARDWARE:	
13	SEC. SEALS:	
14	SPRINGS:	
15		
16	MATERIAL CERTS REQUIRED: YES NO	
17		
18	MATERIALS CERTIFICATES OF CONFORMANCE: YES NO	

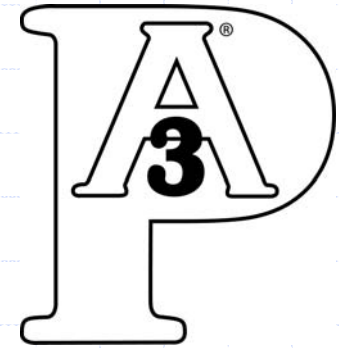
* VENDOR TO SUPPLY INFORMATION WITH QUOTATION



The P3-A Symbol



The P3-A Symbol



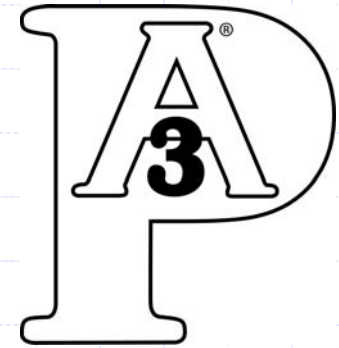
- ◆ Use of P3-A Symbol is strictly voluntary.
- ◆ Mark of conformity for equipment designed and manufactured to a P3-A Standard.
- ◆ Authorization to display mark based on requirements of 3-A SSI.

Why Use The P3-A Symbol?



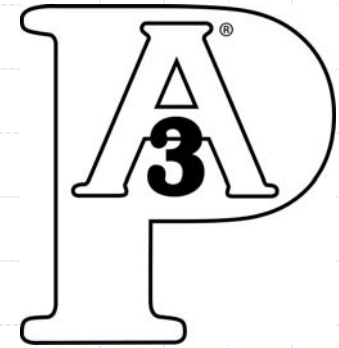
- ◆ **Users and Specifiers gain confidence** the equipment meets basic criteria for the intended application.
- ◆ **Equipment Fabricators gain broad recognition and acceptance** because the mark conveys the equipment conforms to materials, design and fabrication criteria critical to acceptance by customers and regulatory authorities.

P3-A Symbol Authorization



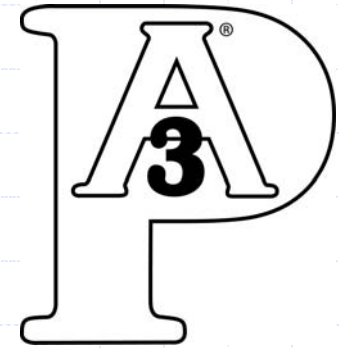
- ◆ Complete application for P3-A Symbol Authorization, available on 3-A SSI web site, see 'Pharmaceutical 3-A'.
- ◆ Review and observe terms of License Agreement.
 - Use of Mark limited to specific models of equipment for which use has been granted.
 - Does not show 'certified', 'approved', 'rated', 'endorsed' or similar.
 - Mark cannot be assigned or conveyed.

P3-A Symbol Authorization



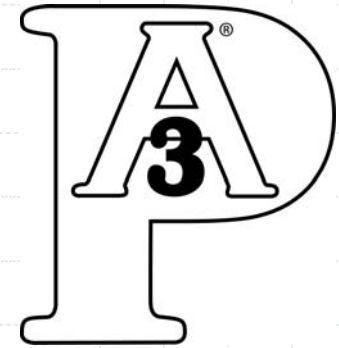
- ◆ Engage independent equipment evaluation professional (Certified Conformance Evaluator) to perform Third Party Verification (TPV) inspection of sample equipment that will bear P3-A Symbol.
- ◆ Send completed application form, TPV report and licensing fee to 3-A SSI.

The Fabricator Perspective



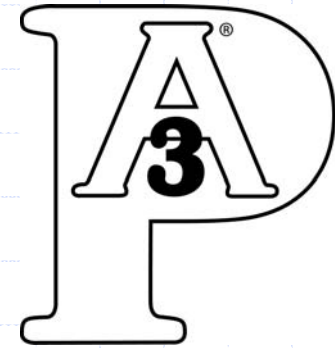
- ❖ Purchase Specifications Based Upon P3-A will Contain Required Data
- ❖ Industry Defined Approach Reduces Purchase Scope Expansion
- ❖ Procurement Process More Uniform
- ❖ End Users More Likely to Focus on Exact Performance Requirements
- ❖ Knowledge That P3-A Symbol Means Competitors Also Meet Criteria

Commercial Display



- ◆ Reproduce the P3-A Symbol to the requirements specified in the Application and License Agreement for Authorization to Apply the P3-A Symbol to Equipment.
- ◆ Reproduce the P3-A Symbol on stainless steel, where possible. If the nature or size of the equipment requires, reduce the size of the 3-A Symbol.
- ◆ Show the P3-A Standard Number immediately in conjunction with the P3-A Symbol.

Commercial Display



- ◆ Affix the P3-A Symbol to the equipment in juxtaposition to the nameplate or as part of the nameplate. The P3-A Symbol may be stamped, etched, embossed or welded on the equipment. If welded, continuously weld the nameplate or P3-A Symbol to the equipment. Alternatively, self-adhesive, durable stickers may be used.
- ◆ Be sure the display of the P3-A Symbol is compatible with all regulatory criteria.
- ◆ Use the P3-A Symbol in advertising or promotional information only in conjunction with equipment/machinery for which the P3-A Symbol authorization has been granted.



New Standards Development

P3-A NEW STANDARDS ACTIVITY

WORKING GROUPS HAVE BEEN TASKED TO CREATE:

- FILTER DRYER STANDARDS FOR API MFG.**
- VESSELS & AGITATORS FOR API MFG.**
- MILLS & CLASSIFICATION EQUIPMENT**
- PROCESS HEAT EXCHANGERS FOR API MFG.**

P3-A NEW STANDARDS ACTIVITY

Standard For Filter Dryers For Use In The Manufacture of Active Pharmaceutical Ingredients

- **This standard will provide the minimum requirements for the design of cleanable filter dryers for the manufacture of active pharmaceutical ingredients.**

P3-A NEW STANDARDS ACTIVITY

Standard For Vessels and Agitators For Use In The Manufacture of Active Pharmaceutical Ingredients

- **This standard will provide the minimum requirements for the design of cleanable vessels and agitators for the manufacture of active pharmaceutical ingredients.**

P3-A NEW STANDARDS ACTIVITY

Standard For Mills and Classification Equipment For Use In The Manufacture of Active Pharmaceutical Ingredients

- **This standard will provide the minimum requirements for the design of cleanable mills and classification equipment for the manufacture of active pharmaceutical ingredients.**

P3-A NEW STANDARDS ACTIVITY

Standard For Process Heat Exchangers For Use In The Manufacture of Active Pharmaceutical Ingredients

➤ **This standard will provide the minimum requirements for the design of cleanable process heat exchangers for the manufacture of active pharmaceutical ingredients.**

P3-A NEW STANDARDS ACTIVITY

METHODOLOGY

STANDARD	MATL'S	DIMENSIONAL STD	CLEANABILITY	DOCUMENT CONTROL	SEAL & SEAL CHAMBER	DATA SHEET
ASME B.73						
3A						
API-610						
ISO						
OTHER						



P3-A NEW STANDARDS ACTIVITY

METHODOLOGY

- 1) 'Foundation' documents developed; now ready to undergo further review in Work Groups of subject matter specialists.**
- 2) When approved by Work Groups, draft documents forwarded to P3-A Steering Committee.**
- 3) Draft documents to enter consensus process.**

P3-A NEW STANDARDS ACTIVITY

YOUR INPUT TODAY!

- 1) List other relevant standards, guidelines, and commercial specifications for such API equipment.**
- 2) Review and refine specific scope of document as needed; review criteria to be incorporated into draft document.**
- 3) Provide any other relevant commentary on draft document, as appropriate (such as the need to include charts, graphs, illustrations, etc.); refer names of key suppliers (companies/contacts).**

