



# Air Force Uniform Development



U.S. AIR FORCE

*AFLCMC... Providing the Warfighter's Edge*



## Product Development

JAPBI

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# Unique Challenges



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**Berry Amendment**

**National Defense Authorization**

**Congressional**

**Urgent Operational Needs**



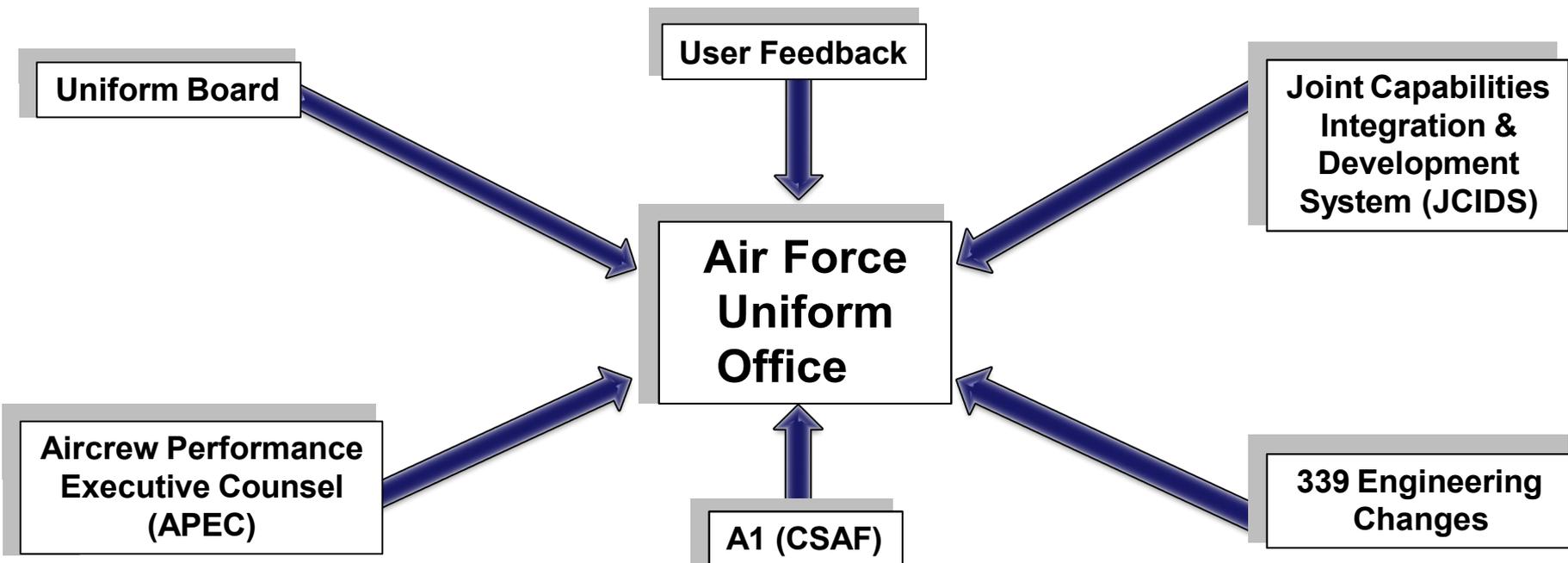


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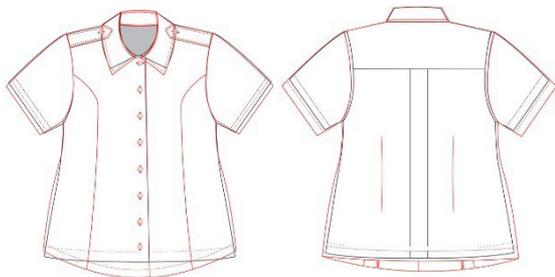
# Requirements



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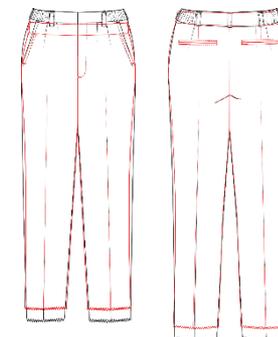
**Maternity Top**



**Wool Overcoat**



**Women's Slacks**





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# Initial Research



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## Market Research

Use Survey and Focus Group Feedback as Starting Point on Market Research



**Industry Research**  
Review Products, Look at  
New Technology, Get  
Inspiration on Garment  
Construction, Analyze  
Industry Fits



**Sister Services**  
Check Sister Services  
for Existing Product



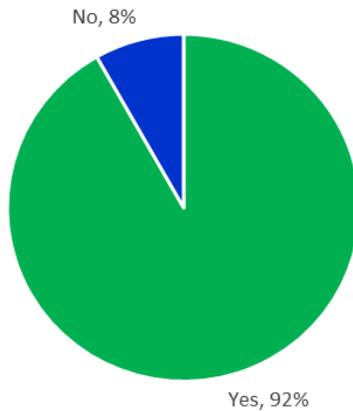
# Initial Research

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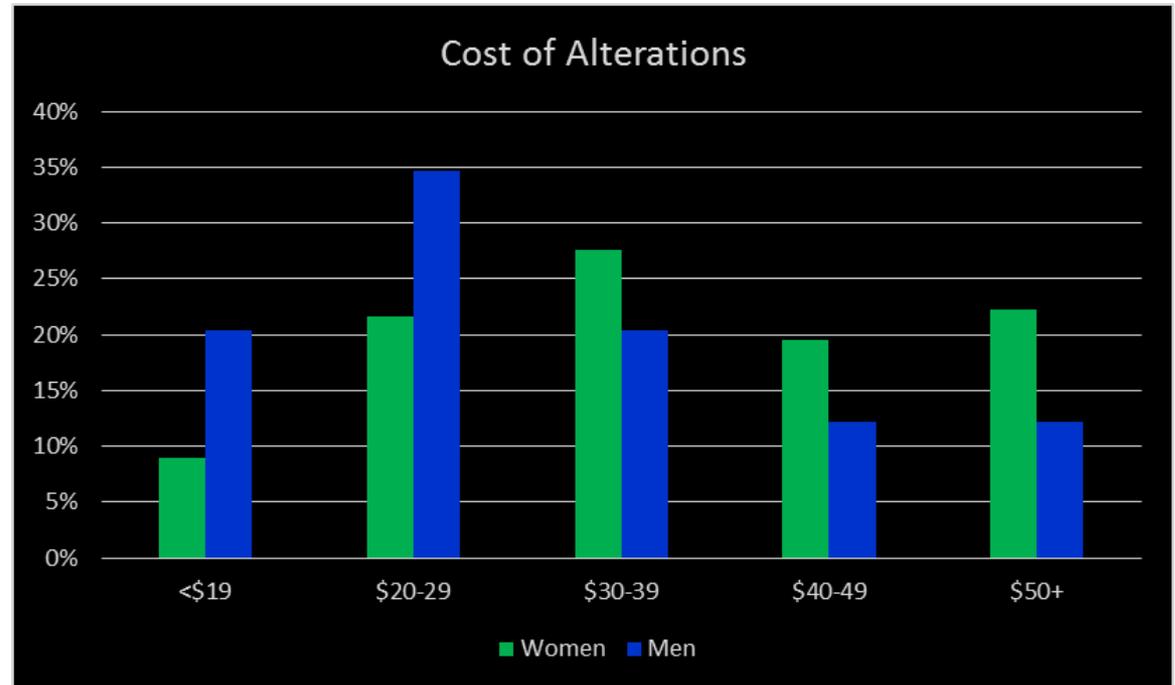
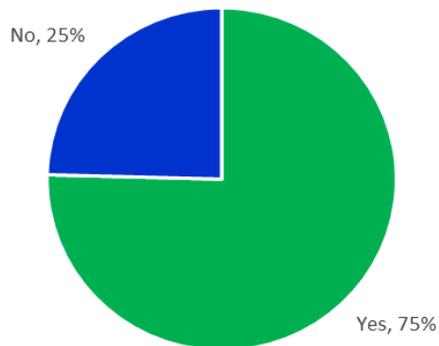


## Alterations Research

Do You Alter Your Slacks: Women



Do You Alter Your Trousers: Men





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# Initial Research

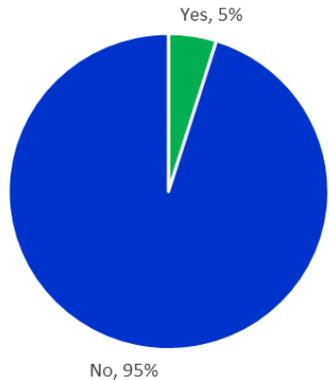


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## Survey and Focus Group Women's Slacks

Create Survey, Hold Focus Groups, Use Information for Design Development

Complimentary Fit: Women

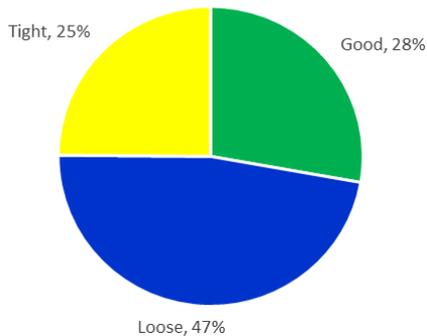


**8.7% Good**

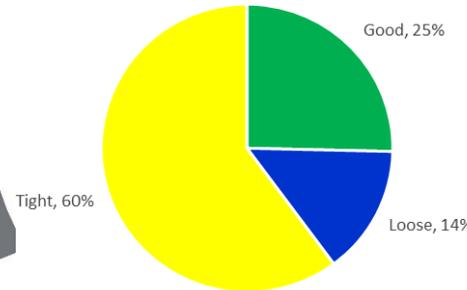
**34.3% Fair**

**57.0 % Poor**

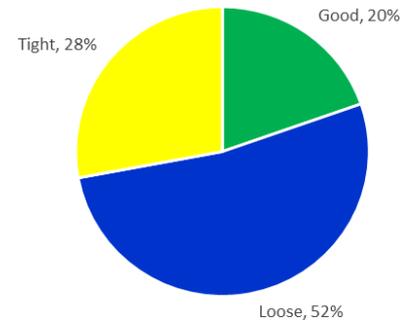
Fit of the Thigh: Women



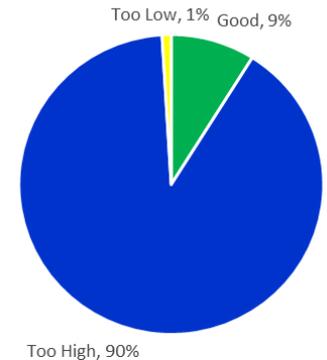
Fit of the Waist: Women



Fit of the Hip: Women



Design of Waist: Women





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# Initial Research

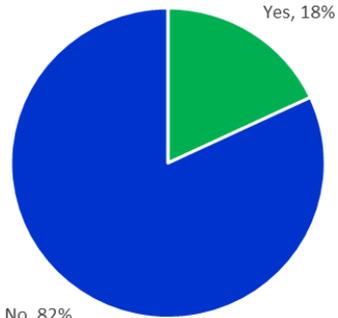


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## Survey and Focus Group Men's Trousers

Create Survey, Hold Focus Groups, Use Information for Design Development

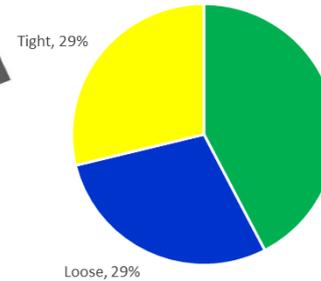
Complimentary Fit: Men



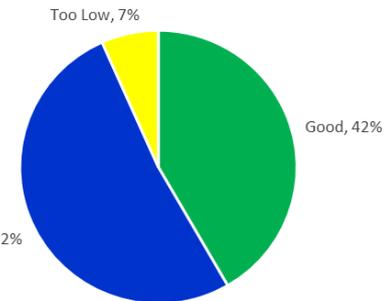
**13.11% Good**

**3.20% Excellent**

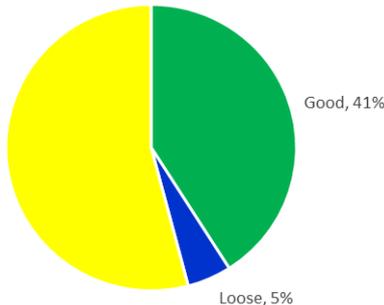
Fit of the Waist: Men



Design of Waist: Men

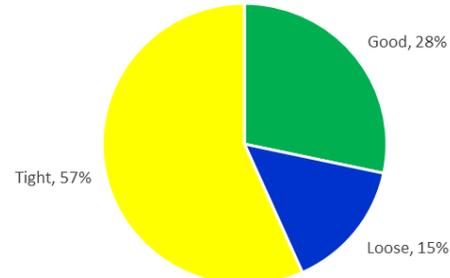


Fit of the Thigh: Men



**49.18% Fair**

Fit of the Hip: Men



**34.51% Poor**



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# Material Research



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1. Requirement

2. Request for Information (RFI)

3. Threshold

4. Objectives



## What to Keep in Mind:

- Protection
- Flame Resistance
- Durability
- Colorfastness
- Comfort
- Wicking
- Air Permeability
- Hand
- Mature Technology
- Commercial Off the Shelf
- NDI

6. Selecting Possibilities that Meet Needs

5. Industry Submissions



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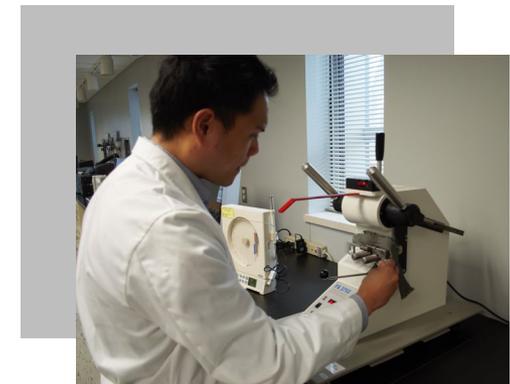
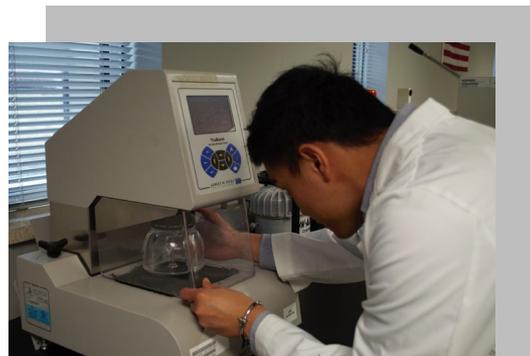
# Material Testing & Evaluation



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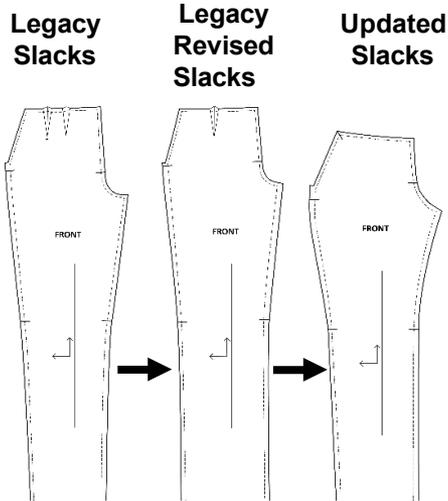
## Characteristics

- Weave
- Weight
- Contents
- Spectral Reflectance
- Breaking Strength
- Elmendorf Tearing
- Piling
- Abrasion Resistance
- Seam Efficiency
- Colorfastness
- Laundering
- Light Exposure
- Perspiration
- Crocking
- Wicking
- Drying Time
- Blocking
- Moisture Vapor Transmission Rate
- Air Permeability
- Thermal Shrinkage
- Thermal Protective Performance
- Thermal Performance Estimated Value
- Char Length
- Melting and Dripping Observation
- Electrical Surface Resistivity
- Antimicrobial Properties

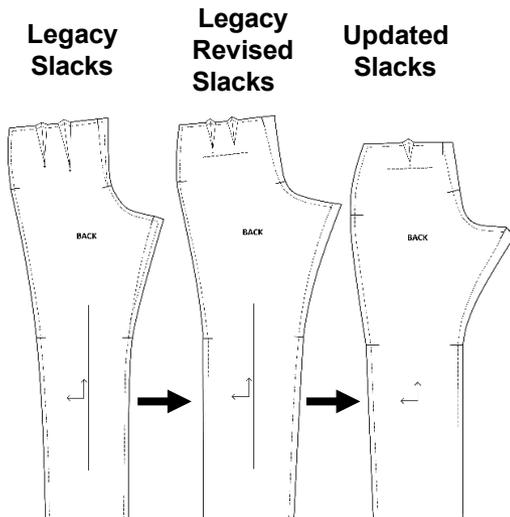




# Prototyping



**Legacy Slacks Compared to Updated Improvements**



**Contract with Industry for Following:**

- Prototypes requiring special equipment
- Fit test assets
- Wear test assets
- Pattern verification samples



# Fit Test



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Points of Measure  
Maternity Fit Test



## How

- Use anthropometric measuring
- Record various point of measure
- Record pinched measurements
- Users test mobility of garment

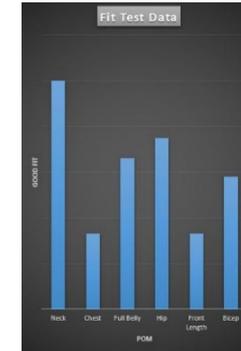
## Recruitment

- Test at multiple bases if possible
- Recruit broad cross section of ages/sizes



## Data

- Condense all participant measurements and fit data
- Analyze similar areas of fit issues
- Examine user comments



## Why

- Evaluate fit of prototype
- Identify areas of improvement
- Collect data
- Gather feedback
- Select participants for wear test
- Assess visual defects



## Results

- Changes made based on test results
- Produce verification samples and collect new data
- Finalize fit with a final prototype





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# Wear Test

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## Purpose

- Confirm the design, fit, and function based on the fit test
- Confirm the garment will withstand the typical wear and tear of everyday use
- Confirm the Airmen can perform the typical work related function comfortably
- Confirm if there is no change to the fit or color fastness from dry cleaning or home laundering

**Men's Service Dress (SD) Trousers Wear Test**  
End of Test Evaluation

Inventory of Terms

Complaint: The fit of the trousers is not restrictive and readily allows performance of typical work functions.

1. Do you prefer to wear the new SD Trousers or the current SD Trousers?  New  Current

2. How many times did you wear the new SD Trousers?

3. How did you care for your test trousers?

4. After washing, did you notice changes in the fit?  Yes  No

5. If yes, were the test trousers:

6. How did the test trousers fit in each of the following areas?

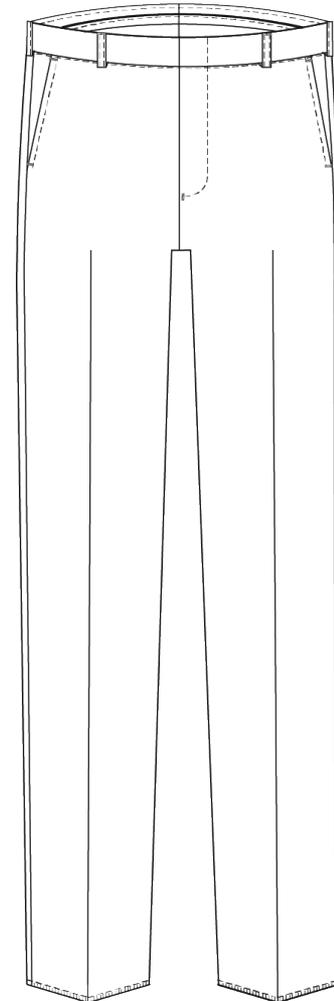
	Loose	Slightly Loose	Good	Slightly Tight	Tight
Waist	<input type="radio"/>				
Hips	<input type="radio"/>				
Thighs	<input type="radio"/>				
Overall	<input type="radio"/>				

7. Please rate the test trousers in the following areas:

	Excellent	Very Good	Good	Fair	Poor	Not Applicable
Waist	<input type="radio"/>					
Hips	<input type="radio"/>					
Thighs	<input type="radio"/>					
Overall Fit	<input type="radio"/>					
Overall Comfort	<input type="radio"/>					

8. Were you able to comfortably perform the following activities?

	Yes	No
Sitting	<input type="radio"/>	<input type="radio"/>
Walking	<input type="radio"/>	<input type="radio"/>
Running	<input type="radio"/>	<input type="radio"/>
Climbing Stairs	<input type="radio"/>	<input type="radio"/>



## Survey

Men's Service Dress Trouser Inspection - Wear Test Assets  
January 2018

Mar/Rcdr	TIC	Size	1/2 Waist	1/2 Hip	1/2 Knee	1/2 Bottom	Front Rise	Back Rise	Inseam	Outseam		
MT-061	26S	Tol	± 1/4	± 1/4	± 1/4	± 1/4	± 1/4	± 1/4	± 1/2	± 1/2		
		Spec	13 1/4	19	12 3/8	9	8 5/8	8 3/4	11 7/8	34	41 7/8	
		Act										
MT-062	26R	Diff	-13 1/4	-19	-12 3/8	-9	-8 5/8	-8 3/4	-11 7/8	-34	-41 7/8	
		Spec	13 1/4	19	12 3/8	9	8 5/8	8 3/4	9 1/4	12 3/8	36	44 3/8
		Act										
MT-063	27S	Diff	-13 1/4	-19	-12 3/8	-9	-8 5/8	-9 1/4	-12 3/8	-36	-44 3/8	
		Spec	13 3/4	19 3/8	12 5/8	9 1/8	8 3/4	8 7/8	12	34	42	
		Act										
MT-064	27R	Diff	-13 3/4	-19 3/8	-12 5/8	-9 1/8	-8 3/4	-9 3/8	-12 1/2	-36	-44 1/2	
		Spec	14 1/4	19 3/4	12 7/8	9 1/4	8 3/4	8 1/2	11 5/8	32	39 5/8	
		Act										
MT-065	28XS	Diff	-14 1/4	-19 3/4	-12 7/8	-9 1/4	-8 3/4	-9 1/2	-11 5/8	-32	-39 5/8	
		Spec	14 1/4	19 3/4	12 7/8	9 1/4	8 3/4	9	12 1/8	34	42 1/8	
		Act										
MT-066	28S	Diff	-14 1/4	-19 3/4	-12 7/8	-9 1/4	-8 3/4	-9	-12 1/8	-34	-42 1/8	
		Spec	14 1/4	19 3/4	12 7/8	9 1/4	8 3/4	9 1/2	12 5/8	36	44 5/8	
		Act										
MT-067	28R	Diff	-14 1/4	-19 3/4	-12 7/8	-9 1/4	-8 3/4	-9 1/2	-12 5/8	-36	-44 5/8	
		Spec	14 1/4	19 3/4	12 7/8	9 1/4	8 3/4	9 1/2	12 5/8	36	44 5/8	
		Act										
MT-068	28R	Diff	-14 1/4	-19 3/4	-12 7/8	-9 1/4	-8 3/4	-9 1/2	-12 5/8	-36	-44 5/8	
		Spec	14 1/4	19 3/4	12 7/8	9 1/4	8 3/4	9 1/2	12 5/8	36	44 5/8	
		Act										

## Inspection Sheet

**Air Force Service Men's Dress Trouser Wear and Laundering Log**

Participant Name: \_\_\_\_\_ Location: Joint Base Annapolis

Trouser TIC #: MT 096

EXAMPLE

Trouser	1	2	3	4	5	6	7	8	9	10	11	12	13
Washed			X				X						

February

Date	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Day	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W
Hours Worn																	
Washed	X							X						X			

March

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Day	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu
Hours Worn					7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Washed		X						X									X									X	

Comments: Trousers feel good, stretching

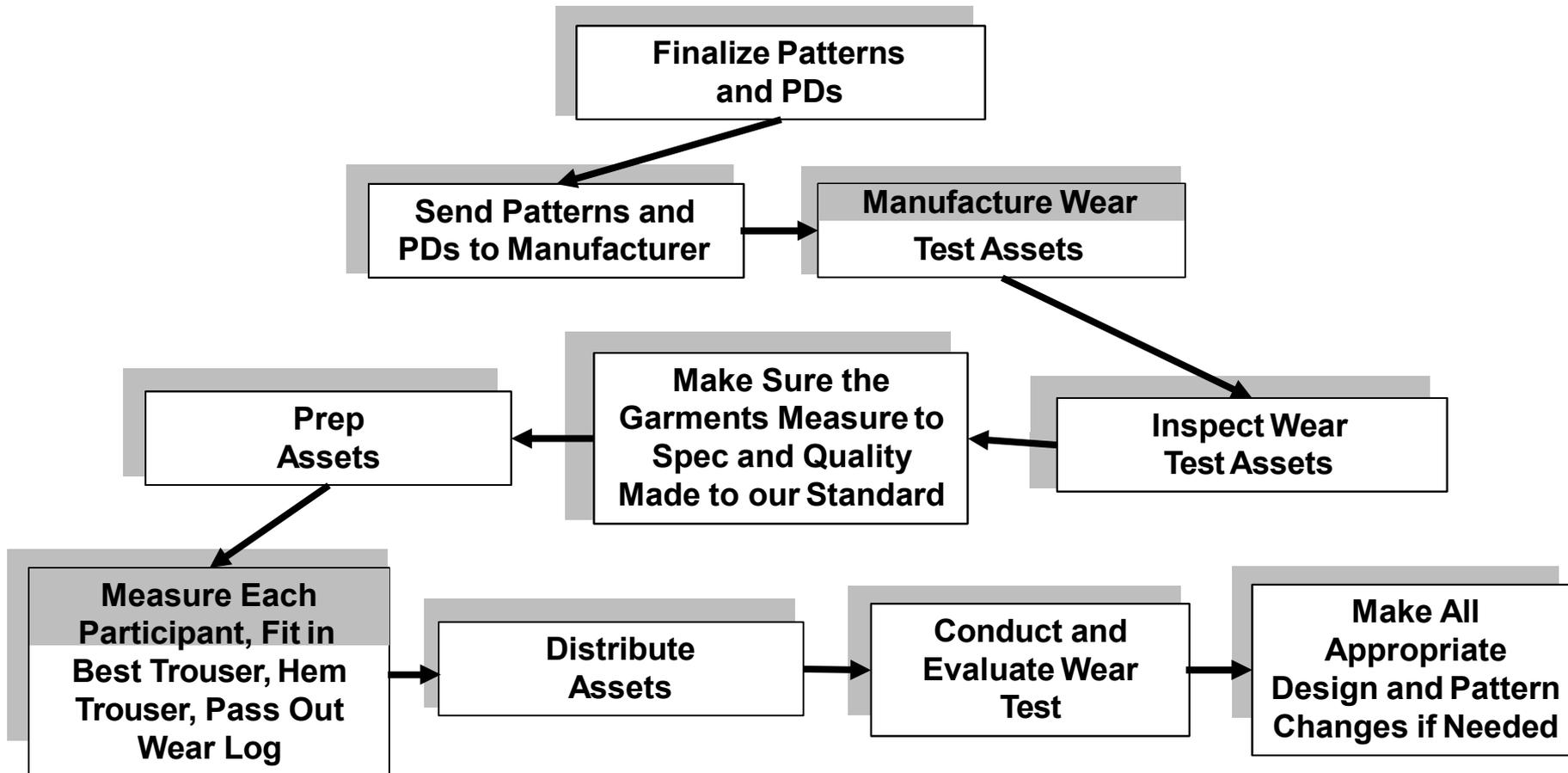
## Wear Test Log



# Wear Test



## Tasks

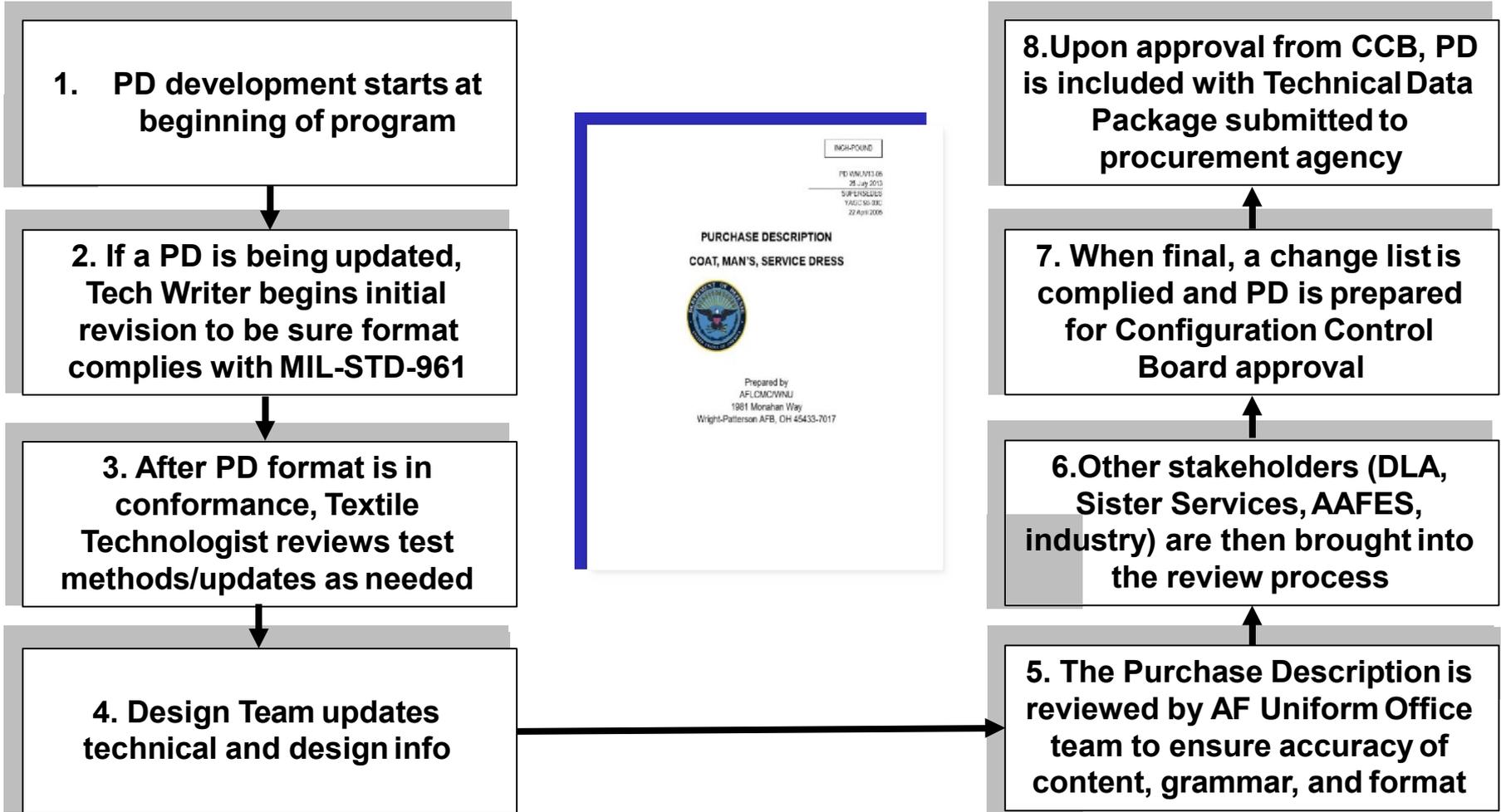




# Purchase Description Development



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# Transition to Sustainment



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## Air Force Uniform Office

