

RECOMMENDATIONS AND LIMITATIONS OF USE

The recommendations given below are general and may be subjected to local statutory or safety /use. Procedures mandated within your facility. If in doubt about proper usage or garment protection values, consult your Radiation Safety Officer or a qualified radiations physicist or radiologist. Their advice will minimize total dose based on equipment, kV, filtration, procedure, exposure time, distance, scatter and other important factors. It is proper practice, at a minimum, to wear at least one personal dosimeter inside the garment at chest level; preferred practice may require a further abdomen dosimeter, worn inside, and/or a further chest dosimeter worn outside-usually on the chest pocket.

TYPE	MODEL CODE # & NAME	FRONT mm Pb	BACK mm Pb	RECOMMENDED USE/ LIMITS
FRONT PROTECTION	AWC, CBV, SBC	0.50	0	X-Ray garment for front protection only. For use in general radiology and x-ray or operating rooms etc., where radiation comes from the front NOT for nuclear/gamma use.
	EBA, LSF, SPL	0.50	0	
	303, 403, 503	0.50	0	
	WBT, TFA, SDO, SDA	0.50	0	
FULL PROTECTION	VAS*, EVAS, RVAS	0.50	.25	X-Ray garment for FRONT & BACK protection. For use in X-Ray, OR, angio, cardiac cath labs, etc. especially for long duration procedures NOT for nuclear/gamma use.
	MWA, LSW*	0.50	.25	
	VST*, RVST, EVST	0.50	.25	*Have only half (50%) the stated mm Pb, in EACH front Panel but are designed, sized and MUST be worn with full Front panel overlap (side-to-side +/-) to achieve stated mm Pb.
	SKT*, 103S*, L103S*	0.50	.25	
	ESKT*, RSKT*	0.50	.25	
	103, B103, L103, 103V, L103V, 203	0.50	.25	X-Ray garment for FRONT & BACK protection. For use in X-Ray, OR, angio, cardiac cath labs, etc. especially for long duration procedures NOT for nuclear/gamma use. Front panels are designed to provide only a partial overlap, thus each front panel provides 0.5 mm Pb in each panel to achieve the stated mm Pb.
GONAD PROTECTION	HSV, ASB	0.50	0	Gonadal protection for X-ray to be used with other protection for a total of 1.0 mm Pb.
	PGS, GND	0.50	0	
THYROID PROTECTION	NST, TCV, SVT, REV-TC, LSC	0.50	0	Collars to provide protection to the thyroid.
THINKING CAP	399989-400024	0.125, 0.25, 0.50	0	Cap to provide protection to the head/brain. Only Protection in front, top Cool Wear (black material) is not protective

CARE, MAINTENANCE & INSPECTION

The warranty of the garments is 2 year from date of manufacture. Infab core material is guaranteed for 2 years against cracking, stiffening, or pinholes; with careful use and proper storage, the useful life should be several years. When not in use, garments should be placed on a hanger. **AVOID CONTACT WITH SHARP OBJECTS AS THESE MAY PENETRATE THE GARMENT'S PROTECTIVE CORE.**

For transportation, the garments should be carefully rolled up and put in a box or tube. We recommend Scrubbles and Clorox Hydrogen Peroxide Cleaner Disinfectant Spray for cleaning and disinfecting as they have been formulated for this purpose.

DO NOT IRON	DO NOT DRY CLEAN	DO NOT AUTOCLAVE
DO NOT BLEACH	DO NOT USE ALKALI DETERGENTS	

Regular inspections of the garment, at least annually, are recommended, using radiographic or fluoro operating at 70-90kV. Lines may indicate cracks; dots may appear indicating air bubbles which do not compromise the protection. (seen as darker on film, lighter on fluoro) – consult your Radiation Safety Officer. For more information, reference www.infabcorp.com/pinholes.

WARNING – DO NOT MODIFY GARMENT AS THIS MAY AFFECT PROTECTION AND INVALIDATE WARRANTY



INSTRUCTIONS FOR USE

INFAB X-RAY PROTECTION APRON

Document Control# **IFU-A**

INFORMATION FOR USE

INFAB APRONS & GLOVES

REVISION #009

11/2016

Infab's lead and Bi-Layer garments will give safe X-radiation protection for several years if properly used and maintained. Recommendations and use limitation are provided below. The following file pertains to the labeling, use, fit, maintenance, protection, ergonomics, manufacturing, and design of Infab's lightweight apparel.

Before using, please read the User Information provided in this Notice.

CE CERTIFICATION

Article 10 & Article 11B certification for Directive 89/686/EEC issued by Notified Body number 0338: BTTG Testing & Certification Ltd. Unit 14, Wheel Forge Way Trafford Park, Manchester M17 EH, United Kingdom

ERGONOMICS & USE OF ACCESSORIES

Infab Corporation garments use proprietary Bi-Layer mixtures providing the user with weight-savings of up to 40% when compared to conventional materials. The lightweight aprons – especially those with front and back protection – are appropriate for use in all procedures, reducing fatigue and back strain. All garments, except skirts, thyroid collars and half aprons have shoulder pads. Models # are further provided with an elastic belt to transfer weight off the shoulders. The SDO and SDA aprons are designed to be worn over your scrub and under your O.R. gown where it can be quickly removed without breaking the sterile field. We suggest the protection garments are worn over cotton clothes to remain cool. The use of a thyroid collar is recommended at all times. Maximum comfort, proper protections, and body cover require proper sizing.

PRODUCT SAFETY SPECIFICATIONS

Manufacturer Specification: Infab radiation protection aprons meet the basic safety and health requirements of the PPE directive 89/686/EEC. Infab radiation protection garments are in compliance with these requirements, proven by testing using the IEC 61331-1:2014 standard (proving the aprons' lead equivalency to be at least 0.50mm Pb @ 50-110 kVp). Full protection aprons (cover front and back) are at least 0.25mm Pb @ 50-110 kVp in back. All thyroid collars and gonad shields are at least 0.50mm Pb @ 50-110 kVp. Each batch and lot of core material is tested under the ASTM method to get Attenuation results. Attenuation results are then used to get lead equivalency using conversion chart below, to make sure it meets the standards, making these items meet the safety and health requirements of the PPE directive 89/686/EEC.

ATTENUATION CHART

Area Density (Ws)	Lead			KIARMOR Low-Lead			KIARMOR Lead-Free		
	.25 mm	.35 mm	.50 mm	.25 mm	.35 mm	.50 mm	.25 mm	.35 mm	.50 mm
Ws - 3.04	98.8%	99.7%	99.9%	98.9%	99.6%	99.9%	98.7%	99.6%	99.9%
Ws - 4.26	95.1%	97.6%	99.1%	96.5%	98.1%	99.4%	96.1%	98.0%	99.4%
Ws - 6.08	90.7%	94.5%	97.4%	92.5%	95.6%	98.0%	92.0%	95.3%	97.8%
DIRECT BEAM	87.5%	92.3%	96.1%	88.5%	93.1%	96.5%	87.8%	92.7%	96.3%

PROTECTION, ATTENUATION / TRANSMISSION VALUES

How core material is used to gain different lead equivalencies

LEAD	
1 layer 250 = 0.25mm Pb @50-110 kVp	2 layers 250 = 0.50mm Pb @50-110 kVp
1 layer 350 = 0.35mm Pb @50-110 kVp	4 layers 250 = 1.0mm Pb @50-110 kVp
KIARMOR	
1 layer 250 = 0.25mm Pb @50-110 kVp	2 layer 250 = 0.50mm Pb @50-110 kVp
1 layer 350 = 0.35mm Pb @50-110 kVp	4 layers 250 = 1.0mm Pb @50-110 kVp

FIT & SIZING

For comfort and protection you must wear the right size/fit garment. The aprons and vests are **separately patterned in MALE or FEMALE** categories. The FEMALE fit has a much smaller armhole, providing superior breast protection from side radiation. Garment #ASB, HSV (Half Apron) and NST, TCV, SVT (Thyroid Collars), are unisex. Proper **garment sizing is important**. Under-, or over- sizing may provide inadequate body coverage, may be uncomfortable, may stress or damage seams or material, may be extra heavy and on a repeated basis, may lead to premature cracking of the core sheets. Infab's alphabetic sizing code, fully described in the Sales Brochure, is summarized:

Garments are available in range of lengths, graded to widths, from 95-120cm, measured from shoulder to bottom. Your label indicates length/ size code. We suggest lengths between 3 cm above, to 5 cm below, the patella, depending on the beam direction. Gonad shields are worn as a belt. Shielded area is harnessed around body with the aid of a belt and buckle.

Female Frames

	X-Small	Small	Medium	Large	X-Large	XX-Large
Bust	30-32" / 76-81 cm	33-36" / 84-94 cm	37-39" / 94-99 cm	40-42" / 102-107 cm	43-45" / 109-114 cm	46-48" / 117-122 cm
Waist	25-27" / 64-69 cm	28-30" / 71-76 cm	31-33" / 71-76 cm	34-36" / 86-91 cm	37-39" / 94-99 cm	40-42" / 102-107 cm

Female Standard Apron Lengths

	Frontal Apron	Full Apron	Classic Vest	Classic Skirt	Revolution Vest Front	Revolution Vest Back	Revolution Skirt
X-Small	38" / 97 cm	38" / 97 cm	20" / 51 cm	18" / 46 cm	22" / 56 cm	26" / 66 cm	22" / 56 cm
Small	38" / 97 cm	38" / 97 cm	22" / 56 cm	20" / 51 cm	22" / 56 cm	26" / 66 cm	22" / 56 cm
Medium	38" / 97 cm	38" / 97 cm	24" / 61 cm	22" / 56 cm	22" / 56 cm	26" / 66 cm	22" / 56 cm
Large	38" / 97 cm	38" / 97 cm	25" / 64 cm	23" / 58 cm	22" / 56 cm	26" / 66 cm	22" / 56 cm
X-Large	38" / 97 cm	38" / 97 cm	26" / 66 cm	24" / 61 cm	22" / 56 cm	26" / 66 cm	22" / 56 cm
XX-Large	38" / 97 cm	38" / 97 cm	27" / 69 cm	25" / 64 cm	24" / 61 cm	28" / 66 cm	22" / 56 cm

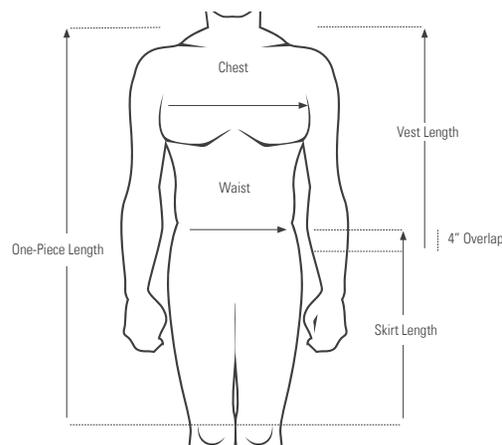
Male Frames

	Small	Medium	Large	X-Large	XX-Large
Chest	34-37" / 86-94 cm	38-41" / 97-104 cm	42-45" / 107-114 cm	46-49" / 117-125 cm	50-52" / 127-132 cm
Waist	28-31" / 71-79 cm	32-35" / 81-89 cm	36-39" / 91-99 cm	40-43" / 102-109 cm	44-46" / 112-117 cm

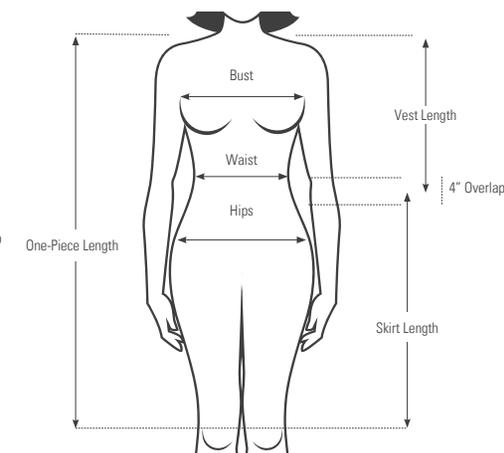
Male Standard Apron Lengths

	Frontal Apron	Full Apron	Classic Vest	Classic Skirt	Revolution Vest Front	Revolution Vest Back	Revolution Skirt
Small	38" / 97 cm	38" / 97 cm	22" / 56 cm	20" / 51 cm	24" / 61 cm	28" / 71 cm	22" / 56 cm
Medium	38" / 97 cm	38" / 97 cm	24" / 61 cm	22" / 56 cm	24" / 61 cm	28" / 71 cm	22" / 56 cm
Large	38" / 97 cm	38" / 97 cm	25" / 64 cm	23" / 58 cm	24" / 61 cm	28" / 71 cm	22" / 56 cm
X-Large	42" / 107 cm	38" / 97 cm	26" / 66 cm	24" / 61 cm	24" / 61 cm	28" / 71 cm	22" / 56 cm
XX-Large	44" / 112 cm	38" / 97 cm	28" / 71 cm	25" / 64 cm	26" / 66 cm	30" / 71 cm	22" / 56 cm

Male Frames



Female Frames



LABELING / MARKING

Inside the garment you will find two labels like the ones shown opposite, which identify the specific model, size and protection of your garment:

Type of 'core' material	Unique garment Serial ID#
Infab – Red Label (KIARMOR Lead-Free)	Model/Style #
Infab – Black label (Original lead)	Type of protective apron
Infab – Blue Label (KIARMOR Low-Lead)	Manufacture/ address/tel
Male or Female cut/style	Date of Manufacture (on reverse)
	Lead Equivalent protection @ 50-110 kVp

Front Protection	Full protection (no overlap)	Full protection (overlap)	Half apron	Aprons (back)	Thyroid collar Gonad shields Thinking Cap
 INFAB Corporation www.infabcorp.com 805-987-5255 MODEL NUMBER 303-F-M Type: H  Front: 0.50mm Pb W _e 5.23 Back: 0.25mm Pb W _e 2.61 Tested: 50kVp-110kVp IEC EN 61331-3:2014 Refer to the IFU for complete attenuation figures. Batch# 1234 Lot# 1234 S/O 1234  In compliance with IEC EN 61331-3:2014	 INFAB Corporation www.infabcorp.com 805-987-5255 MODEL NUMBER 103V-F-M Type: HC  Front: 0.50mm Pb W _e 5.23 Back: 0.25mm Pb W _e 2.61 Tested: 50kVp-110kVp IEC EN 61331-3:2014 Refer to the IFU for complete attenuation figures. Batch# 1234 Lot# 1234 S/O 1234  In compliance with IEC EN 61331-3:2014	 INFAB Corporation www.infabcorp.com 805-987-5255 MODEL NUMBER LSWF-M Type: HC  Front: 0.50mm Pb W _e 5.23 All Front Overlap Back: 0.25mm Pb W _e 2.61 Tested: 50kVp-110kVp IEC EN 61331-3:2014 Refer to the IFU for complete attenuation figures. Batch# 1234 Lot# 1234 S/O 1234  In compliance with IEC EN 61331-3:2014	 INFAB Corporation www.infabcorp.com 805-987-5255 MODEL NUMBER HSV-M1  Front: 0.50mm Pb W _e 5.23 Tested: 50kVp-110kVp IEC EN 61331-3:2014 Refer to the IFU for complete attenuation figures. Batch# 1234 Lot# 1234 S/O 1234  In compliance with IEC EN 61331-3:2014	 FDA Infab Corporation is an FDA Registered Medical Manufacturer CERTIFICATIONS  ASTM F-3054-14  IEC 61331-3:2014  DIN 6857-1 NOTICE The warranty of the garment is 2 years from date of manufacture. Initial core material is guaranteed for 2 years against cracking, softening, or voiding, with careful use and proper storage. The useful life should be several years. When not in use, garments should be placed on a hanger. Periodically clean your apron with mild, scrubable apron cleaner. AVOID CONTACT WITH SHARP OBJECTS AS THESE MAY PENETRATE THE GARMENT'S PROTECTIVE CORE. Date of Manufacture: April 2016 REMOVAL VOIDS WARRANTY MADE IN THE USA	Front  INFAB Corporation www.infabcorp.com 805-987-5255 Model Number TCV-31 CE 0338 Back Batch# 6673 Periodically inspect to insure suitability for future use. REMOVAL VOIDS WARRANTY Date of Manufacture: April 2016

USE & LIMITS OF USE

Infab radiation protection garments provide individual personal protection against external x-ray (photon) radiation up to 120 kV, with beam HVL at 6.2 mm Al. Above these kV/HVL values, lead-equivalency protection values (mm Pb) may be less.

Under most conditions of gamma exposure, the composite nature of the Smart Armor core materials invalidates the lead equivalent/transmission values shown.

REV 12/05/16