

2021
FR WORKWEAR





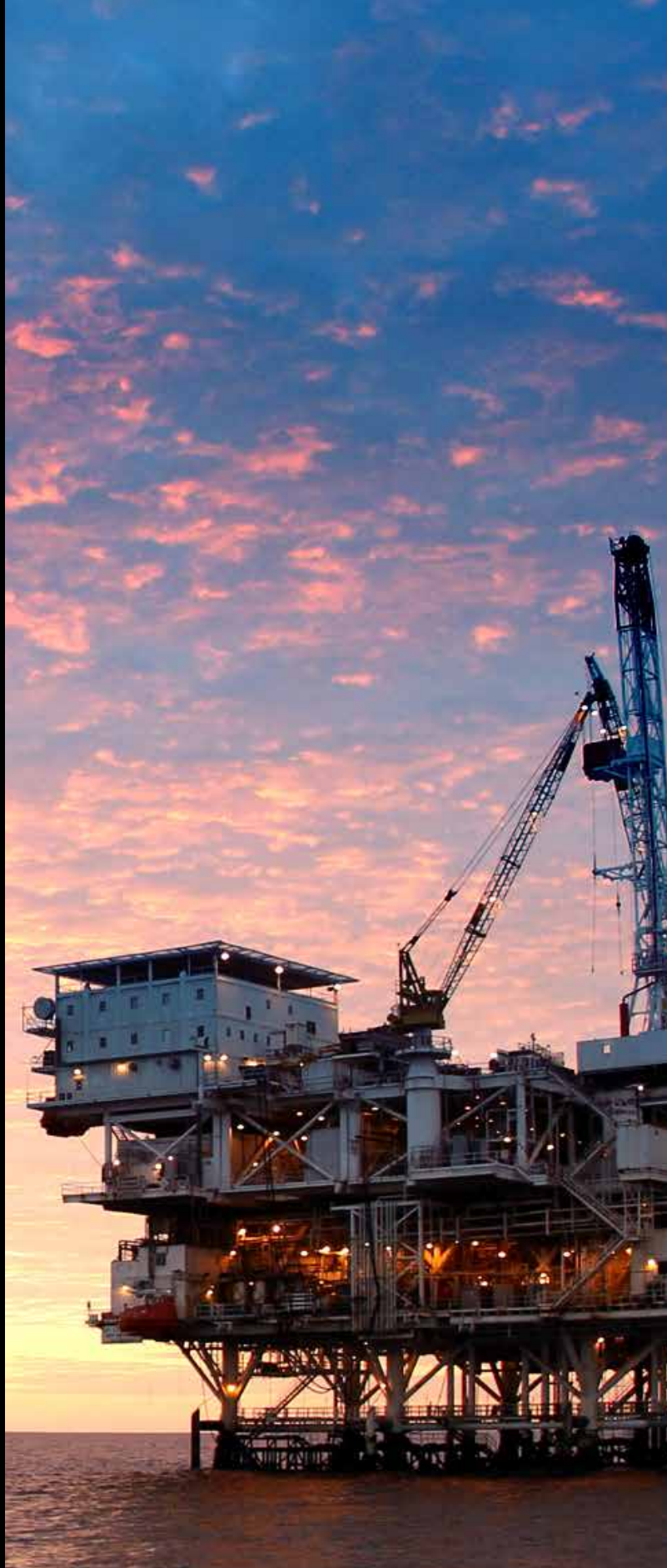
IRONCLAD PERFORMANCE WEAR IS A TECHNOLOGY LEADER IN PERFORMANCE GLOVES WITH AN EXCLUSIVE LIBRARY OF PATENTS AND TRADEMARKS, AS WELL AS MORE THAN 50 EXCLUSIVE MATERIALS, IRONCLAD GLOVES ARE BOTH DIFFERENT AND BETTER THAN THE COMPETITION.

WE DECIDED TO USE OUR EXTENSIVE KNOWLEDGE OF SOURCING, MANUFACTURING AND PRODUCT DEVELOPMENT TO DESIGN AND PRODUCE FR GARMENTS WHICH WOULD STAND UP AND OUT PERFORM THE INDUSTRY LEADERS, WHILE ALSO PRODUCING A PRODUCT WORTHY OF OUR KONG (KING OF OIL N GAS) BRAND.

AS WALK ANYWHERE GARMENTS, THEY ARE GLOBALLY CERTIFIED AND SUITABLE FOR USE IN ALL COUNTRIES. WITH ONLY FIVE GARMENTS WE ARE COVERING ALL INDUSTRY REQUIREMENTS.



KING OF OIL'N GAS



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INTRODUCING **MULTINORM** FR WORKWEAR

INTRODUCING IRONCLAD PERFORMANCE WEAR FLAME RETARDANT COVERALLS UNDER OUR SUCCESSFUL KONG OIL & GAS BRAND; TO FURTHER ENHANCE OUR SAFETY PERFORMANCE RANGE. OUR INITIAL RANGE OF COVERALLS ARE AVAILABLE FROM LIGHTWEIGHT TO HEAVY WEIGHT SUITABLE FOR COLD, MODERATE AND HOT CLIMATES.

RIGOROUSLY TESTED BY INDEPENDENT TEST LABORATORIES AND CERTIFIED TO BS EN AND NFPA MULTI NORM STANDARDS, OUR GARMENTS ARE SUITABLE FOR GLOBAL USAGE, ALLOWING INVENTORY TO BE MOVED AND USED IN ALMOST ALL REGIONS OF THE WORLD. RIGS MOVING FROM EN REGULATED REGIONS TO USA/NFPA REGULATED REGIONS HAVE NO NEED TO RE-STOCK TO MEET LOCAL SAFETY DIRECTIVES.

WE ARE OFFERING TREATED FR AND INHERENTLY FR OPTIONS, GIVING CHOICE AND FLEXIBILITY TO END USERS. CONSTRUCTED USING COMFORTABLE, DURABLE FABRICS WHICH PROVIDE HIGH PERFORMANCE, PROTECTION AND POSITIVE DESIGN FEATURES INCLUDING INTERNAL KNEE PAD POCKETS, SAFETY RADIO LOOPS AND THREE NEEDLE SEAMS THROUGH-OUT.

ALL OF OUR GARMENTS ARE ANTI-STATIC TESTED TO BS EN 1149-5 AND MEETING THE REQUIREMENTS FOR NFPA 70E, PROVIDING ADDITIONAL ELECTRIC ARC AND ESD SPARK PROTECTION FOR WORKING IN HAZARDOUS ENVIRONMENTS.

INNOVATION | QUALITY | AUTHENTICITY



HRC1 HRC2



FLAME RESISTANT WORKWEAR
SUITABLE FOR ALL CLIMATES

#IAMIRONCLAD



NORTH SEA FR COVERALL **KFRC350**

- 98% cotton, 2% antistatic
- Mandarin collar for safety (foldable)
- 3 needle stitching through-out
- Reflective tapes at shoulders, arms and legs
- Pencil pocket on wearer's left sleeve
- 2 chest patch pockets with zip closure
- Safety/radio loops above chest pockets
- 2 way heavy duty plastic zipper
- Front placket with hidden hook & loop closure
- 2 side pockets with hook & loop
- Cargo pocket on left leg
- 2 back patch pockets
- Leg rule pocket
- Kneepad pockets
- Elastic back waistband
- Action back
- Adjustable tabs at sleeves
- Weight 350gm

* NFPA2112, NFPA70E AVAILABLE ON REQUEST WITH ADDITION OF FR ZIPPERS AND THREADS

SIZES: 34R - 60R

COLOURS:

WASHING:

STANDARDS:



EN ISO
11611:2015
A1A2



EN ISO
11612:2015
A1A2,B1,C1,F1



EN
1149-5:2018



Category
2



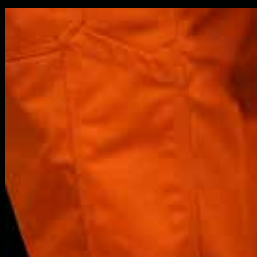
SLEEVE PENCIL POCKETS



CHEST PATCH ZIP POCKETS



HOOK & LOOP CLOSURE
MANDARIN COLLAR



LEG TOOL POCKET



HOT CLIMATE FR COVERALL **KFRC230**

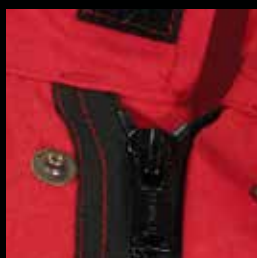
- 98% cotton, 2% antistatic
- Mandarin collar for safety (foldable)
- 3 needle stitching through-out
- Reflective tapes at shoulders, arms and legs
- Pencil pocket on wearer's left sleeve
- 2 chest patch pockets with zip closure
- Safety/radio loops above chest pockets
- FR 2 way heavy duty plastic zipper
- Front placket with hidden hook & loop closure
- 2 side pockets with hook & loop
- Cargo pocket on left leg
- 2 back patch pockets
- Leg rule pocket
- Kneepad pockets
- Elastic back waistband
- Action back
- Adjustable tabs at sleeves
- Weight 230gm

SIZES: 34R - 60R

COLOURS:

WASHING:

STANDARDS:



FR HD PLASTIC ZIPPER



3 NEEDLE STITCHING THROUGH-OUT



SECURE CARGO POCKET



50MM REFLECTIVE TAPES

INHERENTLY
FLAME
RETARDANT



IFR HOT CLIMATE COVERALL KIFRC180

- 50% Modacrylic / 38% Cotton / 10% Para Aramid / 2% Antistatic
- Winged collar for keeping cool
- 3 needle stitching through-out
- Reflective tapes at shoulders, arms and legs
- Pencil pocket on wearer's left sleeve
- 2 flapped chest pockets with hook & loop closure
- Safety/radio loops above chest pockets
- FR 2 way heavy duty plastic zipper
- Front placket with hidden hook & loop closure
- 2 side pockets with hook & loop
- Cargo pocket
- 2 back patch pockets
- Leg rule pocket
- Kneepad pockets
- Elastic back waistband
- Action back
- Adjustable tabs at sleeves
- Weight 180gm

SIZES: 34R - 60R

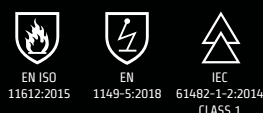
COLOURS:

INHERENTLY
FLAME
RETARDANT

INHERENTLY FLAME RETARDANT AND HIGH TEMPERATURE RESISTANT, THE FABRIC DOESN'T MELT, DRIP OR SUPPORT COMBUSTION IN THE AIR. BECAUSE THERMAL PROTECTION IS OBTAINED VIA ITS MOLECULAR STRUCTURE, RATHER THAN BY APPLYING A RETARDANT CHEMICAL TO A FABRIC, FLAME RESISTANT CHARACTERISTICS CANNOT BE WASHED OUT OR WORN AWAY.

WASHING:

STANDARDS:



FEATURE DESIGN FOCUS

KIFRC180



WINGED COLLAR FOR KEEPING COOL



CARGO POCKET ON LEFT LEG



SAFETY/RADIO LOOPS



3 NEEDLE STITCHING THROUGH-OUT



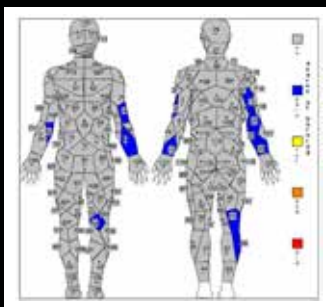
50MM REFLECTIVE TAPES



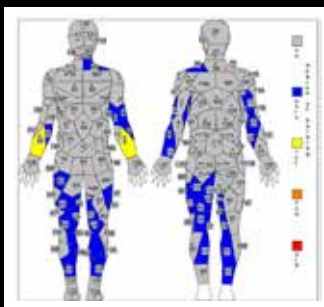
HD FR 2 WAY ZIPPERS

BURN PREDICTION DATA

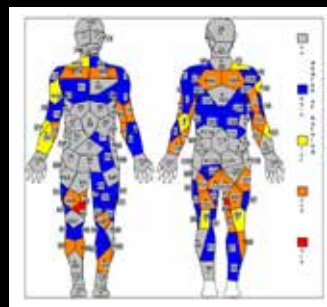
THE EVALUATION OF THE PROTECTIVE GARMENTS WAS BASED ON THE PERFORMANCE REQUIREMENTS OF SECTION 7.5 OF NFPA 2112-2018 WHICH STATES SPECIMEN GARMENTS SHALL BE TESTED FOR OVERALL FLASH FIRE EXPOSURE AS SPECIFIED IN SECTION 8.5, MANIKIN TEST, AS A QUALIFICATION TEST FOR THE MATERIAL AND SHALL HAVE A BODY BURN RATING OF NOT MORE THAN 50%.



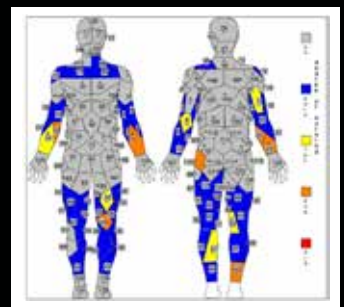
KIFRC350 THERMOTEX
TEST RESULT : 6.8%



KIFRC230 THERMOTEX
TEST RESULT: 6.5%



KIFRC180 THERMOTEX
TEST RESULT : 23.9%



KIFRC220 THERMOTEX
TEST RESULT : 10.6%

THE PREDICTED BURN INJURY ON THE TOTAL MANIKIN (EXCEPT HANDS AND FEET) INCLUDING THE HEAD IN THE CALCULATIONS ARE ALL WELL WITHIN THE ACCEPTABLE LIMITS.



IFR HOT CLIMATE COVERALL KIFRC220

- 51% Modacrylic / 30% Cotton / 12% Para Aramid / 5% Nylon / 2% Antistatic
- Mandarin collar for safety (foldable)
- 3 needle stitching through-out
- Reflective tapes at shoulders, arms and legs
- Pencil pocket on wearer's left sleeve
- 2 chest patch pockets with zip closure
- Safety/radio loops above chest pockets
- FR 2 way heavy duty plastic zipper
- Front placket with hidden hook & loop closure
- 2 side pockets with hook & loop
- Cargo pocket
- 2 back patch pockets
- Leg rule pocket
- Kneepad pockets
- Elastic back waistband
- Action back
- Adjustable tabs at sleeves
- Weight 220gm

SIZES: 34R - 60R

COLOURS:

WASHING:

STANDARDS:



SAFETY RADIO LOOPS



MANDARIN COLLAR



KONG FR BRANDING



LEG RULE POCKET



84/14/2 FR BLENDED COVERALL KFRC250

- 84% Cotton / 14% Nylon / 2% Antistatic
- Mandarin collar for safety (foldable)
- 3 needle stitching through-out
- Reflective tapes at shoulders, arms and legs
- Pencil pocket on wearer's left sleeve
- 2 chest patch pockets with zip closure
- Safety/radio loops above chest pockets
- FR 2 way heavy duty plastic zipper
- Front placket with hidden hook & loop closure
- 2 side pockets with hook & loop
- Cargo pocket
- 2 back patch pockets
- Leg rule pocket
- Kneepad pockets
- Elastic back waistband
- Action back
- Adjustable tabs at sleeves
- Weight 250gm

SIZES: 34R - 60R

COLOURS:

WASHING:

STANDARDS:



50MM REFLECTIVE TAPE



3 NEEDLE STITCHING THROUGH-OUT



HIDDEN ZIP CLOSURE ON CHEST POCKETS



MANDARIN SAFETY COLLAR



LADIES FR COVERALL KFR350

- Mandarin collar for safety (foldable)
- 3 needle stitching through-out
- Reflective tapes at shoulders, arms and legs
- Pencil pocket on wearer's left sleeve
- 2 chest patch pockets with zip closure
- Safety/radio loops above chest pockets
- 2 way heavy duty plastic zipper
- Front placket with hidden hook & loop closure
- 2 side pockets with hook & loop
- Cargo pocket
- 2 back patch pockets
- Kneepad pockets
- Elastic back waistband
- Action back
- Adjustable tabs at sleeves
- Weight 350gm

SIZES: 34R - 60R

COLOURS:

WASHING:

STANDARDS:



HRC2
ATPV
9 CAL/CM²



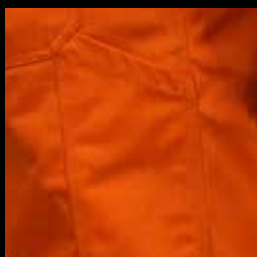
MANDARIN COLLAR



CHEST PATCH ZIP POCKETS



SLEEVE PENCIL POCKETS



LEG TOOL POCKET



HOT CLIMATE FR TWO TONE COVERALL COMING SOON

- 98% cotton, 2% antistatic
- Mandarin collar for safety (foldable)
- 3 needle stitching through-out
- Reflective tapes at shoulders, arms and legs
- Pencil pocket on wearer's left sleeve
- 2 chest patch pockets with zip closure
- Safety/radio loops above chest pockets
- 2 way heavy duty plastic zipper
- Front placket with hidden hook & loop closure
- 2 side pockets with hook & loop
- Cargo pocket on left leg
- 2 back patch pockets
- Leg rule pocket
- Kneepad pockets
- Elastic back waistband
- Action back
- Adjustable tabs at sleeves
- Weight 230gm

SIZES: 34R - 60R

COLOURS:

WASHING:

STANDARDS:



FABRIC GUIDE



OUR FOCUS ON QUALITY IS INFUSED THROUGH-OUT OUR ENTIRE DESIGN AND MANUFACTURING PROCESS, FROM INITIAL SKETCHES TO THE FINISHED PRODUCT. LIKE OUR GLOVES, ALL GARMENTS ARE DESIGNED AND CONSTRUCTED WITH PERFORMANCE, FIT AND COMFORT IN MIND.

HIGH QUALITY ENSURES LONGEVITY, THE CUSTOMER RECEIVES VALUE FOR MONEY THROUGH EFFICIENT COST IN USE AND WE REDUCE OUR ENVIRONMENTAL IMPACT.

IRONCLAD PERFORMANCE WEAR CONTINUES TO GROW AND INNOVATE; BRINGING NEW TECHNOLOGIES TO THE EVERYDAY HEROES, THE UNHERALDED MEN AND WOMEN WHO WE DEPEND ON EVERY SINGLE DAY.

IT'S A MISSION WE ARE PROUD OF AND STRIVE TO DELIVER ON EVERYDAY.

KONG FR COTTON 350GM

98% COTTON | 2% ANTISTATIC

Flame Retardant properties which sustains even after 100 washes. Most suitable for cold climate use. The fabric is produced using long staple cotton. With cotton being a good hydrophilic substance, it absorbs the user's perspiration adding to their comfort. The product incorporates 2% antistatic blending to enhance the protection of user by dissipating the electrostatic build-up.

KONG FR COTTON 230GM

98% COTTON | 2% ANTISTATIC

Flame Retardant properties which sustains even after 100 washes. Most suitable for hot climate use. The fabric is produced using long staple cotton. With cotton being a good hydrophilic substance, it absorbs the user's perspiration adding to their comfort. The product incorporates 2% antistatic blending to enhance the protection of user by dissipating the electrostatic build-up.

KONG INHERENTLY FR COTTON 180GM

50% MODACRYLIC | 38% COTTON | 10% PARA-ARAMID | 2% ANTISTATIC

Inherent Flame Retardant properties which do not wash away and remain for the entire life cycle of the garment. Most suitable for hot climate use. The fabric is hypoallergenic and produced with modacrylic as its core fibre which gives the fabric its inherent FR properties. Modacrylic blended with cotton is very soft and comfortable for the wearer. The para-aramid helps in maintaining the strength of the fabric even on lower fabric weights. Combined with modacrylic and cotton, provides strong flame resistant properties. The antistatic fibre is intimately blended to enhance the protection of user by dissipating the electrostatic build-up.

KONG INHERENTLY FR COTTON 220GM

51% MODACRYLIC | 30% COTTON | 12% PARA-ARAMID |

5% NYLON | 2% ANTISTATIC

Inherent Flame Retardant properties which do not wash away and remain for the entire life cycle of the garment. Most suitable for hot climate use. The fabric is hypoallergenic and produced with modacrylic as its core fibre which gives the fabric its inherent FR properties. Modacrylic blended with cotton is very soft and comfortable for the wearer. The para-aramid and nylon helps in maintaining the strength of the fabric even on lower fabric weights. The nylon also provides higher abrasion resistance and durability of the garment. Combined with modacrylic and cotton, provides strong flame resistant properties. The antistatic fibre is intimately blended to enhance the protection of user by dissipating the electrostatic build-up.

KONG FR COTTON 250GM

84% COTTON | 14% NYLON | 2% ANTISTATIC

Flame Retardant properties which sustains even after 100 washes. Most suitable for hot climate use. The fabric is produced using long staple cotton. With cotton being a good hydrophilic substance, it absorbs the user's perspiration adding to their comfort. The addition of nylon provides higher abrasion resistance and durability of the garment. The product incorporates 2% antistatic blending to enhance the protection of user by dissipating the electrostatic build-up.

FEATURE GUIDE



We can provide a bespoke or customer designed garment to meet your specific requirements - working with you to remove or add features from our standard designs. Our specifications vary across all styles.



FR MATRIX



QUICK REFERENCE STYLE MATRIX CONTAINING ALL GARMENT FEATURES, TEST SPECIFICATIONS AND FABRIC PROPERTIES.

MODEL	KFRC350	KFRC230	KIFRC180	KIFRC220
COLOUR FASTNESS	4	4	4	4
FORMALDEHYDE LEVEL	<50ppm	<50ppm	N/A	N/A
SHRINKAGE AFTER 5 WASHES	-2%	-2%	-2%	-2%
ABRASION STRENGTH	30000 CYCLES @ 12kPa	20000 CYCLES @ 12kPa	15000 CYCLES @ 9kPa	20000 CYCLES @ 12kPa
TENSILE STRENGTH	>10N	>10N	>10N	>10N
FABRIC TYPE	98/2 COTTON / AS	98/2 COTTON / AS	MODA / COTTON / PARA ARAMID / AS	MODA/COTTON/PARA.ARAMID/NYLON/AS
FABRIC WEIGHT	350GM+/-5%	230GM+/-5%	180GM+/-5%	220GM+/-5%
WEAVE - SOFT FINISH TWILL	●	●	N/A	N/A
EN 11612:2015 A1.A2.B1.C1.F1	●	●	●	●
EN 11611:2015 A1.A2 CLASS 1	●	●	●	●
EN 1149-5:2018	●	●	●	●
IEC 61482-1-2	●	●	●	●
EN 13688:2013	●	●	●	●
ISO 6330:2012 @ 60C	●	●	●	●
NFPA 2112:2018	● *	●	●	●
HRC CATEGORY	HRC2 *	HRC2	HRC1	HRC2
ASTM F1959 / F1959M-14	●	●	●	●
OEKO TEX 100	●	●	●	●
3 NEEDLE SEAMS	●	●	●	●
50MM FR TAPE DOUBLE STITCHED	●	●	●	●
FR THREADS	● *	●	●	●
HD FR VISLON ZIPPERS	● *	●	● **	●
2 ZIPPED CHEST POCKETS	●	●	●	●
2 HOOK & LOOP CHEST POCKETS	●	●	●	●
SIDE ACCESS POCKETS	●	●	●	●
ELASTICATED ACTION BACK	●	●	●	●
2 REAR POCKETS	●	●	●	●
SIDE RULE LEG POCKET	●	●	●	●
KNEEPAD POCKETS	●	●	●	●
UPPER ARM SLEEVE POCKET	●	●	●	●
ALL METAL CONCEALED	●	●	●	●
RADIO LOOPS ON UPPER CHEST	●	●	●	●
MANDARIN COLLAR	●	●	●	●
WINGED COLLAR	●	●	●	●
STANDARDS PRINTED ON LABELS	●	●	●	●
KONG LOGO ON SLEEVE & WAIST	●	●	●	●
* KFRC350 DOES NOT HAVE FR ZIPPERS OR THREADS AS STANDARD BUT CAN ON REQUEST FOR MEETING NFPA2112, NFPA70E STANDARDS				
** KIFRC 180 DOES NOT HAVE FR VISLON ZIPPERS ON CHEST POCKETS				

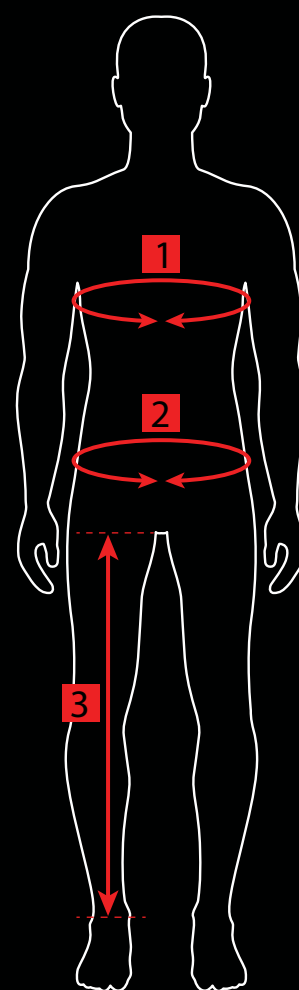
SIZING GUIDE



SELECTING THE CORRECT SIZE GARMENT IS IMPORTANT, A PROFESSIONAL NEEDS THE RIGHT FIT AND SIZE TO DO THE BEST JOB POSSIBLE. INCORRECT SIZING CAN CAUSE INCONVENIENCE TO THE WEARER, ESPECIALLY DOING CERTAIN TASKS. THIS CAN ALSO POSE A SAFETY ISSUE TO OTHER WORKERS AROUND THEM. IRONCLAD PERFORMANCE WEAR ENSURES OUR GARMENTS HAVE THE CORRECT FIT, WITH EASY ACCESSIBILITY AND OPTIMUM SAFETY. FOR THE CORRECT FIT IT IS IMPORTANT TO MAKE SURE YOU HAVE SELECTED THE RIGHT SIZE.

MEASUREMENT INSTRUCTIONS

- 1 CHEST**
Measure the fullest part of the chest just under armpit level
- 2 WAIST**
Measure around your natural waistline
- 3 LENGTH**
Measure from the top of inside leg to your required length



UK	34	36	38	40	42	44	46	48	50	52	54	56	58	60
US	34	36	38	40	42	44	46	48	50	52	54	56	58	60
EU	44	46	48	50	52	54	56	58	60	62	64	66	68	70
1 CHEST	104	109	114	119	124	129	134	139	144	149	154	159	164	169
2 WAIST	94	99	104	109	114	119	124	129	134	139	144	149	154	159
3 LENGTH	151-158	153-160	155-162	157-164	159-166	161-168	163-170	165-172	167-174	169-176	171-178	171-178	173-180	173-180

SELECTING THE CORRECT SIZE GARMENT IS IMPORTANT, A PROFESSIONAL NEEDS THE RIGHT FIT AND SIZE TO DO THE BEST JOB POSSIBLE. INCORRECT SIZING CAN CAUSE INCONVENIENCE TO THE WEARER, ESPECIALLY DOING CERTAIN TASKS. THIS CAN ALSO POSE A SAFETY ISSUE TO OTHER WORKS AROUND THEM. IRONCLAD PERFORMANCE WEAR ENSURES OUR GARMENTS HAVE THE CORRECT FIT, WITH EASY ACCESSIBILITY AND OPTIMUM SAFETY. FOR THE CORRECT FIT IT IS IMPORTANT TO MAKE SURE YOU HAVE SELECTED THE RIGHT SIZE.

WORKWEAR RATINGS

THE KEY REASON FOR WEARING FR CLOTHING IS TO ENSURE THAT THE GARMENTS DO NOT CATCH FIRE AND/ OR TO LIMIT FLAME SPREAD, THEREBY GIVING TIME TO REACT IN THE EVENT OF AN ACCIDENT. THERE ARE DIFFERENT CERTIFICATIONS AND SYMBOLS FOR DIFFERENT RISKS AND IRONCLAD PERFORMANCE WEAR WANT TO MAKE SURE YOU CHOOSE THE RIGHT COMBINATION THAT FITS YOUR RISK ASSESSMENT. ALL IRONCLAD PERFORMANCE WEAR PPE (PERSONAL PROTECTIVE EQUIPMENT) CLOTHING FOLLOWS THE PPE DIRECTIVE 89/686/EEC AND THE LATEST EUROPEAN (EN) STANDARDS FOR PPE CLOTHING COVERED BY THE DIRECTIVE; IN ADDITION TO THIS OUR GARMENTS MEET THE REQUIREMENTS FOR NFPA2112 AND NFPA 70E.



THERE ARE 3 CATEGORIES WITHIN THE PPE DIRECTIVE/PPE LEGISLATION;

CATEGORY I - LOW RISK OF INJURY (E. G. RAIN PROTECTION EN 343)

CATEGORY II - RISK OF INJURY (E. G. EN ISO 11612 A, B, C, HEAT & FLAME)

CATEGORY III - HIGH RISK OF INJURY (E. G. ELECTRIC ARC IEC 61482-2, MOLTEN METAL EN ISO 11612 D3, E3)

CE MARKING FOR PROTECTIVE GARMENTS

ALL IRONCLAD PERFORMANCE WEAR GARMENTS ARE CE MARKED. THE CE MARKING INDICATES THAT A NOTIFIED BODY HAS CE TYPE EXAMINED THESE GARMENTS ACCORDING TO THE PPE DIRECTIVE 89/686/EEC OR THE PPE LEGISLATION (EU)2016/425. YOU WILL FIND THIS SYMBOL ON THE INSIDE CE LABEL. THE CE LABEL ALSO SHOWS WHICH STANDARDS AND CLASSES THE GARMENTS ARE APPROVED FOR.

ISO 11612 : PROTECTIVE CLOTHING TO PROTECT AGAINST HEAT AND FLAME NFPA2112 : PROTECTIVE CLOTHING TO PROTECT AGAINST FLASH FIRE

THIS STANDARD SPECIFIES PPE CLOTHING WHEN WORKING WHERE THERE IS A RISK THAT THE GARMENTS WILL COME INTO CONTACT WITH HEAT AND FLAME. THE STANDARD IS DIVIDED IN DIFFERENT CATEGORIES, WHERE THE CODE LETTERS SHOW WHICH HEAT AND FLAME REQUIREMENTS THE GARMENT NEEDS TO FULFILL. AT LEAST TWO CATEGORIES MUST BE TESTED TO BE ABLE TO CE MARK THE GARMENTS. CODE LETTER A1 AND/OR A2 IS MANDATORY AND THE RESULT IS INCLUDED ON THE CE LABEL TOGETHER WITH THIS SYMBOL. THE CODE LETTERS ARE CLASSIFIED IN DIFFERENT LEVELS WHERE THE HIGHEST NUMBER IS THE HIGHEST TESTED LEVEL. THE DESIGN OF THE GARMENT IS ALSO A PARAMETER IN THE CE MARKING FOR HEAT AND FLAME GARMENTS.

A1, A2 - REQUIREMENTS FOR LIMITED FLAME SPREAD; A1: SURFACE IGNITION. A2: EDGE IGNITION.

B (1-3) - PROTECTION AGAINST CONVECTIVE HEAT AND OPEN FLAMES

C (1-4) - PROTECTION AGAINST RADIANT HEAT

D (1-3) - PROTECTION AGAINST MOLTEN ALUMINUM SPLASH

E (1-3) - PROTECTION AGAINST MOLTEN IRON SPLASH

F (1-3) - PROTECTION AGAINST CONTACT HEAT

EN ISO 11612 IS AN INTERNATIONAL STANDARD ALSO APPROVED BY THE US. THE AMERICAN STANDARD FOR PROTECTION AGAINST HEAT AND FLAME IS CALLED NFPA 2112. THE BIGGEST DIFFERENCE IN THE AMERICAN STANDARD IS THE CHAR LENGTH TEST AND THAT SOME TESTS ARE DONE AFTER 100 WASHES. ® 2112 PROVIDES MINIMUM PERFORMANCE CRITERIA AND SETS CLEAR GUIDELINES FOR MINIMUM DESIGN, PERFORMANCE, CERTIFICATION REQUIREMENTS AND TEST METHODS FOR FLAME RESISTANT GARMENTS FOR USE IN AREAS AT RISK FROM FLASH FIRES—SUCH AS THOSE WHERE FLAMMABLE GASES OR VAPORS, OR COMBUSTIBLE DUSTS MIGHT BE PRESENT. THE STANDARD CALLS FOR FLASH FIRE TESTING TO BE CONDUCTED AT THREE SECONDS WITH A PASS/FAIL RATE OF 50% TOTAL BODY BURN UNDER ASTM F1930 (STANDARD TEST METHOD FOR EVALUATION OF FLAME RESISTANT CLOTHING FOR PROTECTION AGAINST FLASH FIRE SIMULATIONS USING AN INSTRUMENTED MANIKIN) TESTING PROTOCOLS.

IEC 61482 : PROTECTIVE CLOTHING AGAINST THE HAZARD OF AN ELECTRIC ARC

ASTM1959 : THE TEST METHOD USED TO CALCULATE ARC RATINGS FOR FR FABRICS





THIS STANDARD SPECIFIES PPE CLOTHING WHEN THERE IS A RISK OF AN ELECTRIC ARC – FOR INSTANCE WHEN WORKING WITH ELECTRICITY ON OPEN EQUIPMENT OR MAINTENANCE / SWITCHING WORK. ELECTRIC ARC GARMENTS COME UNDER PPE DIRECTIVE / PPE LEGISLATION CATEGORY III . FABRIC PROPERTIES AND GARMENT DESIGN ARE IMPORTANT PARAMETERS IN THE CERTIFICATION PROCESS OF ELECTRIC ARC GARMENTS. IRONCLAD PERFORMANCE WEAR ELECTRIC ARC GARMENTS ARE MARKED WITH IEC 61482-2 WHICH INCLUDES BOTH TEST METHODS FOR ELECTRIC ARC: EN 61482-1-1 “OPEN ARC TEST” WHICH INVOLVES A MEDIUM VOLTAGE RANGE (>1 000V) AND EN 61482-1-2 “BOX TEST” WHICH INVOLVES A LOW VOLTAGE RANGE (400V). BOTH TESTS SIMULATE DIFFERENT LEVELS OF RISKS.

EN 61482-1-1 OPEN ARC TEST - THIS TESTS THE PROTECTION LEVEL OF THE GARMENT BY USING AN OPEN ARC, VERY SIMILAR TEST METHOD IS APPLIED UNDER ASTM F1959/F1959M-14 ALTHOUGH PRE TREATMENTS MAY VARY. THE OPEN ARC TEST RESULTS IN AN ARC RATING; ATPV VALUE (ARC THERMAL PERFORMANCE VALUE) AND/OR EBT 50 VALUE (ENERGY BREAK OPEN THRESHOLD). THIS IS AN ARC RATING SYSTEM FOR THE FR FABRIC/FABRIC LAYERS. THE RESULT IS GIVEN IN CAL/CM² AND MEANS THAT AT THIS ENERGY THE GARMENT IS PREDICTED TO PROTECT FROM A SECOND-DEGREE SKIN BURN (WITH A 50% PROBABILITY). THE VALUE HELPS YOU TO CHOOSE THE RIGHT LEVEL OF PROTECTION.

EN 61482-1-2 BOX TEST - TESTS THE PROTECTION CLASS OF THE GARMENTS BY USING A CONSTRAINED AND DIRECT ARC. CLASS 1 - 168 KJ (4 KA, 400V) & CLASS 2 - 320 KJ (7 KA, 400V). A SINGLE LAYER GARMENT WILL IN MOST CASES PASS CLASS 1. TO REACH CLASS 2, A TWO OR THREE-LAYER SYSTEM (OR A THICKER GARMENT SUCH AS A WINTER GARMENT) IS NEEDED.

NFPA70E : THE STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE

THE AMERICAN NFPA 70E STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE IS A CONSENSUS STANDARD ON HOW TO PROTECT WORKERS FROM THE HAZARDS OF AN ELECTRIC ARC. NFPA IS DESIGNED TO HELP EMPLOYEES AND WORKERS TO UNDERSTAND ELECTRICAL HAZARDS, IT HELPS WITH: HAZARD ASSESSMENT, ARC RATED PPE SELECTION AND ELECTRICAL SAFE WORK PRACTICES. THE ARC RATING IS DIVIDED INTO FOUR PPE CATEGORIES. IT IS NORMALLY RECOMMENDED THAT THE OUTER LAYER REACHES 8 CAL/CM² (I.E. PPE 2/CAT 2).

HAZARD RISK CATEGORY (HRC)	CLOTHING DESCRIPTION	REQUIRED MINIMUM ARC RATING OF PPE/cal/cm ²
	ARC RATED FR SHIRT & TROUSERS OR FR COVERALL	4
	ARC RATED FR SHIRT & TROUSERS OR FR COVERALL	8
	ARC RATED FR SHIRT & TROUSERS OR FR COVERALL, & ARC FLASH SUIT SO THAT THE SYSTEM ARC RATING MEETS THE REQUIRED MINIMUM	25
	ARC RATED FR SHIRT & TROUSERS OR FR COVERALL, & ARC FLASH SUIT SO THAT THE SYSTEM ARC RATING MEETS THE REQUIRED MINIMUM	40

EN 1149 : PROTECTIVE CLOTHING WITH ELECTROSTATIC PROPERTIES

THIS STANDARD SPECIFIES PPE CLOTHING USED IN EXPLOSIVE ENVIRONMENTS (I.E. ATEX) WHERE THERE IS A RISK THAT THE GARMENTS COULD CREATE SPARKS (SOURCE OF IGNITION), WHICH IN TURN COULD IGNITE EXPLOSIVE MATERIALS. TO CERTIFY GARMENTS TO THIS STANDARD, THE ANTI-STATIC PROPERTIES OF THE FABRIC ARE TESTED ACCORDING TO EN 1149-1(SURFACE RESISTIVITY) OR EN 1149-3(CHARGE DECAY). THE DESIGN OF THE GARMENT IS ALSO A PARAMETER IN THE CERTIFICATION AND CE MARKING OF ANTI-STATIC/ATEX GARMENTS.

EN ISO 11611 : PROTECTIVE CLOTHING FOR USE IN WELDING & ALLIED PROCESSES

THIS STANDARD SPECIFIES PPE CLOTHING USED IN WELDING WORK OR ALLIED PROCESSES WHERE YOU HAVE THE RISK OF SPATTER (SMALL SPLASHES OF MOLTEN METAL), SHORT CONTACT WITH FLAME, RADIANT HEAT FROM THE ARC, AND RISK OF ELECTRIC SHOCK BY SHORT-TERM, ACCIDENTAL CONTACT WITH LIVE ELECTRICAL CONDUCTORS (AT VOLTAGES UP TO APPROXIMATELY 100 V DC IN NORMAL CONDITIONS OF WELDING). THE STANDARD IS DIVIDED IN TWO DIFFERENT CLASSES WITH DIFFERENT LEVELS OF PROTECTION. THE WELDING FUNCTION OF THE FABRIC IS TESTED WITH 15 DROPS (CLASS 1) OR 25 DROPS (CLASS 2) OF MOLTEN METAL. THE DESIGN OF THE GARMENT IS ALSO A PARAMETER IN THE CE MARKING OF WELDING GARMENTS.

CLASS 1 - PROTECTION AGAINST LESS HAZARDOUS WELDING TECHNIQUES AND SITUATIONS, CAUSING LOWER LEVELS OF SPATTER AND RADIANT HEAT.

CLASS 2 - PROTECTION AGAINST MORE HAZARDOUS WELDING TECHNIQUES AND SITUATIONS, CAUSING HIGHER LEVELS OF SPATTER AND RADIANT HEAT.



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