



OIL INDUSTRIES SAFETY DIRECTORATE (OISD)



3rd National Conclave on Standards for Technical Textiles

Nov 02-03, 2017, FICCI, New Delhi



Standards for Technical Textiles for Safety of Oil Industry Personnel



Activities of OISD



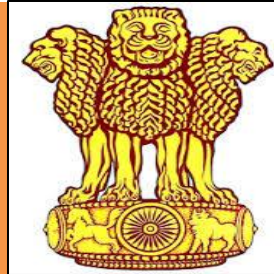
OISD (Oil Industry Safety Directorate) is a Technical Directorate under the Ministry of Petroleum and Natural Gas that formulates and coordinates the implementation of a series of **self regulatory measures** aimed at **enhancing the safety** in the oil & gas industry in India.

Our Objective

- To formulate and standardise **procedures and guidelines**
- To conduct audits to ensure **compliance** to such standards.
- To maintain continuous **follow-up** on compliance to OISD audit action points.
- **Analysis & investigation of incidents** to identify root cause.
- Presentation of Safety Awards.



Activities of OISD



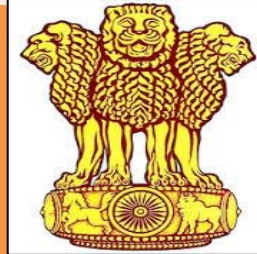
OISD consists of a small core group of technical experts of various disciplines from the industry.

OISD, headed by an **Executive Director**, gets its directions and guidance from the **Safety Council**, the apex body consisting of senior officials of the Ministry of Petroleum and Natural Gas, chief executives of oil/gas companies and heads of the concerned statutory and advisory bodies.

OISD **coordinates with experts** from the industry through various committees to carry out its major activities.

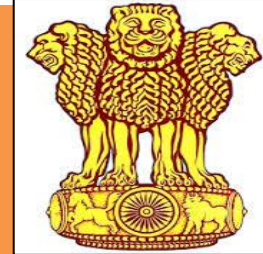
OISD has developed **120 standards** for enhancing the safety of oil and gas industry.

Textile Safety in Oil and Gas Industries



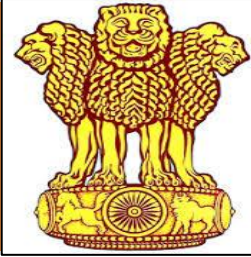
- 1 • Comfort and mobility while in work sites.
Visibility in Offshore.
- 2 • Protection from fire flash fire and chemicals. Certain [Aramids](#) which are inherently flame & chemical resistant
- 3 • Light weight fabric increases comfort & enable air flow. Special finishes enable moisture to spread rapidly.
- 4 • For Offshore a feature of visibility during evacuation etc.
- 5 • Certain specially woven fabrics exhibit superior abrasion and tear resistance
- 6 • Certain fabrics are resistant to range of chemicals and hydrocarbons and many other industrial solvents.
- 7 • Certain fabrics have been developed which can resist electric arc energy

Work Place safety



Various OISD standards are related to work place safety such as

OISD-STD-105	Work Permit System
OISD-STD-154	Safety aspects in functional training
OISD-STD-155 (Part I)	Personal Protective Equipment : Part I Non-respiratory equipment
OISD-STD-155 (Part II)	Personal Protective Equipment : Part II Respiratory Equipment
OISD-GDN-166	Guidelines for Occupational Health Monitoring in Oil and Gas Industry
OISD-STD-176	Safety Health & Environment Training For Exploration & Production(Upstream) Personnel
OISD-STD-189	Standard On Fire Fighting Equipment For Drilling Rigs, Work Over Rigs And Production Installations
OISD-GDN-206	Guidelines on Safety Management System in Petroleum Industry
OISD-GDN-207	Contractor Safety



Personal Protective Equipment : Part I Non-respiratory equipment



HEAD PROTECTION



EYE AND FACE PROTECTION



EAR PROTECTION

HAND AND ARM PROTECTION



BODY PROTECTION



FOOT AND LEG PROTECTION



PERSONAL PROTECTION FOR SPECIFIC HAZARDS

PROTECTIVE TEXTILE



OISD-STD-155
(Part I)

Personal Protective
Equipment

Body Protection



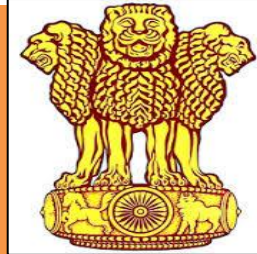
Personal protective equipments required to be used for protection of human body in oil and gas industries include items such as aprons, suits and safety belts. Classified as follows:

Code No.	Protection Against Hazard	Typical Operation
H-1	Flame	Flame proximity and flame entry
H-2	Flying chips & rough objects	Grinding, welding
H-3	Strong acids & alkalis	Handling chemicals
H-4	Organic solvents/Oil	Handling petroleum products
H-5	X-Rays	X-ray techniques
H-6	Accidental fall	Excavation, tank cleaning,
H-7	Accidental fall	Maintenance work at high elevations such as window cleaning & painting/chimney cleaning & painting.

Protective Textile



Selection of equipment for different hazards

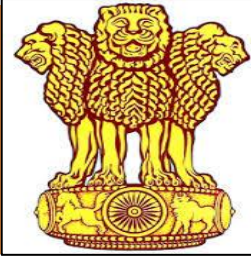


While selecting body protection equipment, it should be borne in mind that the material, of which the equipment is made, will give protection only against hazards as given below

Sl. No.	Protective Wear Recommended	for use against Hazard Code No.
1	Suits/Apron/Jacket of Aluminised fabric and glass fibre insulated fabric / Water Based Gel Blanket	H-1 (Flame)
2	Leather suits /apron/jacket	H-2(Flying chips)
3	Apron/suit/jacket of Rubber, PVC, Plastic coated fabric	H-3, H-4 (Acid, Alkali, Solvents)
4	Lead plastics or lead rubber or lead leather apron / suit/ jacket	H-5 (X-rays)
5	Nylon/Polyester belt and harness	H-6, H-7 (Accidental Fall)



Suits



Following types of suits are commonly used:

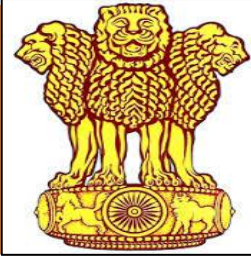
Boiler Suits

Fire Fighting Suits

Chemical Protection Suits



Boiler Suits



- It may be in **one piece or two pieces**.
- It is preferably made up of **cotton fabric** to retain the comforts of air permissibility & moisture transmission.
- It **shall not propagate flame, have afterglow, be self-extinguishing**, shall retain basic characteristics of the fabric, shall be durable to natural detergent washings, dry cleanings & be environment friendly.
- Where persons may be exposed to sparks, flame or heat, **fire retardant clothing** or suits may be used.



Fire Fighting suits



These are of following types :

- Fire Proximity Suit
- Fire Entry Suit

(i) Fire Proximity Suit

It allows the fire fighter to work next to the flames i.e. radiant heat and occasional flame lick for the purpose of rescue work & knockdown fire fighting operations in proximity of flames but not actually in flames.

These suits shall conform to **UL/EN/ NFPA/BIS specifications.**

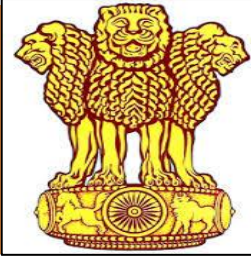


(ii) Fire Entry Suit

It allows the firemen to work in the flames i.e. complete static immersion but for a very **short duration of 20-30 seconds.**



Water based gel blanket



Water based gel blanket consists of woven **pure wool**, impregnated with **sterile water based gel** and provides a shield against the flame, heat & smoke. It may be draped around the body of the person trying to escape through fire. Period of its exposure to heat should be limited to that of the specified period.

It may be draped around the body of a burning/burnt person. It reduces the pain & trauma of wounds/burns. It reduces the **risk of further infection** by physically covering the burns.

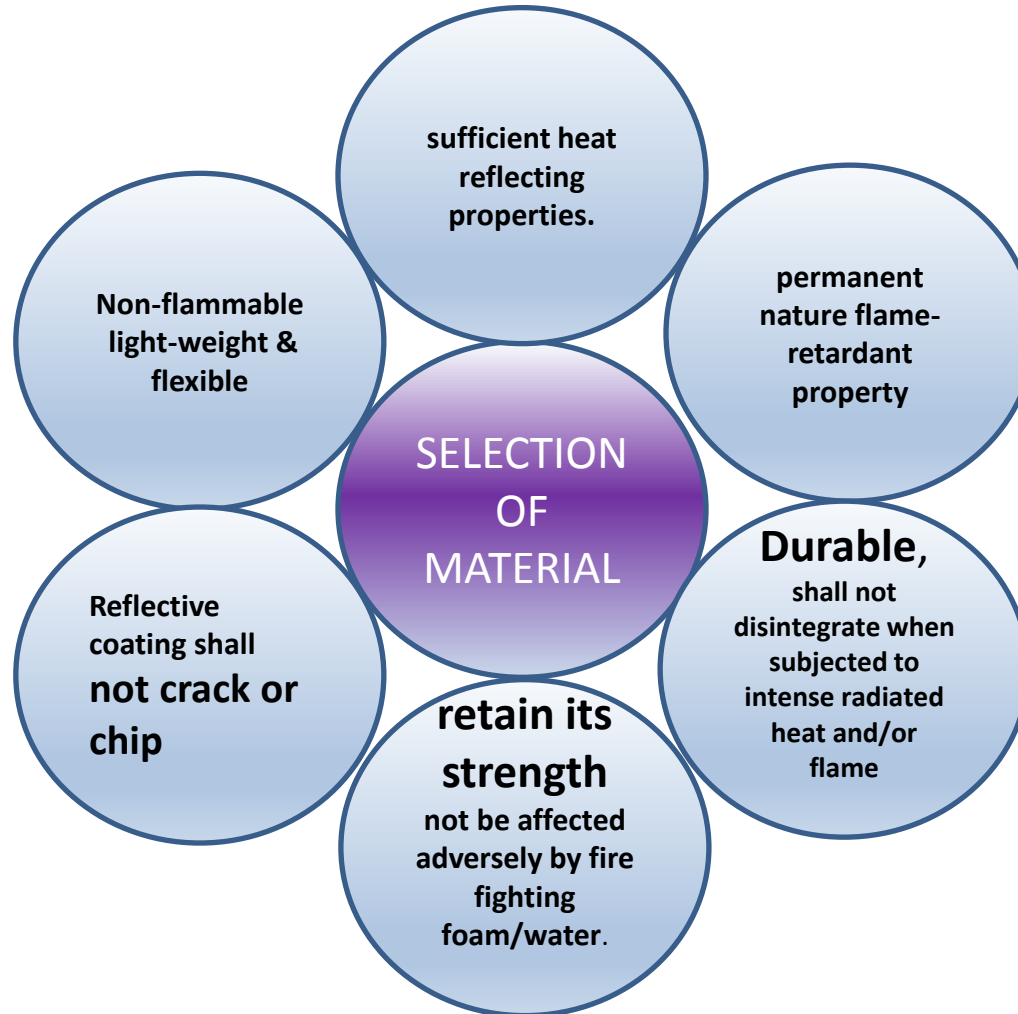
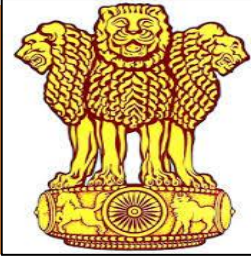


It can also be used to **extinguish small fire** by providing a cover.

The blanket should be kept inside the specified box with proper cover in a cool and hygienically clean place. It should not be handled with infectious hands. **It should be used only before its expiry period.**



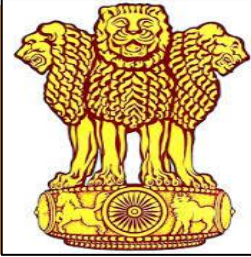
Selection of Material



Protective Textile



Clothing Assembly



Fire entry suits shall have **high thermal capacity** combined with a **high thermal resistance**.



Heat resistant suits shall have a **high thermal resistance** and where possible, the outer surface shall be of such a nature that it **will reflect** the maximum possible heat.

The thickness of the clothing assembly shall not unduly restrict the mobility of the wearer and **it shall not exceed 15 mm**.

All threads used for stitching shall be adequately treated to the same degree

Shall be tested in accordance with **IS-7612** . Clothing assembly/ Undergarments/ lining shall meet all the requirements given in IS-7612.

Protective Textile



Marking and Instruction



Each apron/suit shall **have clear marking** at suitable place regarding manufacturer's name or **trade-mark, size, type, year of manufacture and for flame resistant and heat resistant suit, the exposure time limit**

The apron/suit shall be marked with the **ISI certification mark** or as far as possible PPE must have the approval from certifying authority like **DGFASLI or DGMS.**

Manufacturer's instructions shall be provided with each set of protective clothing

Protective Textile

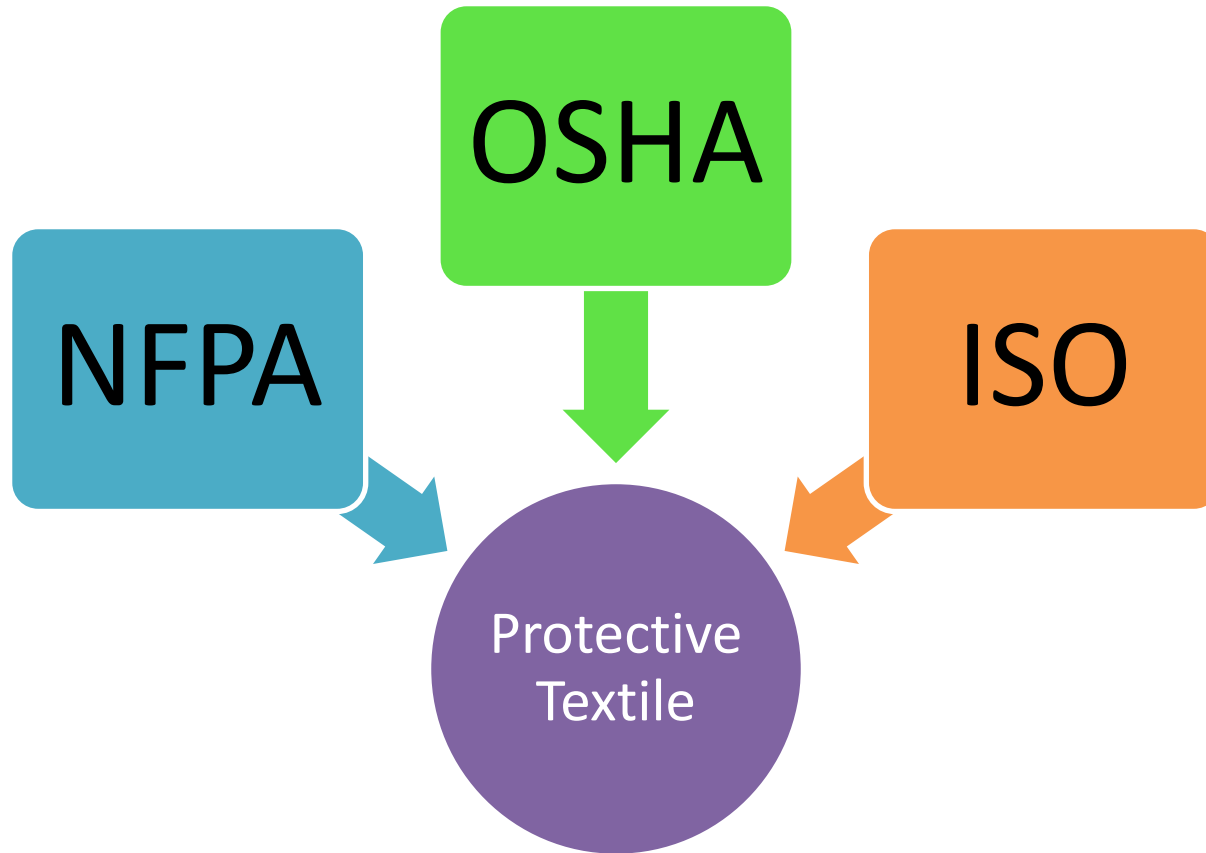
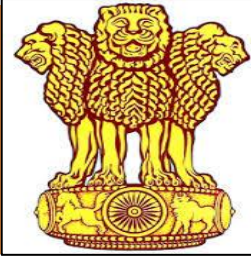




- Specification for Selection of Industrial Safety IS:8519 - 1977
Equipment for Body Protection
- Specification for Code of Practice for Maintenance IS:8990 - 1978
and Care of Industrial Safety Clothing

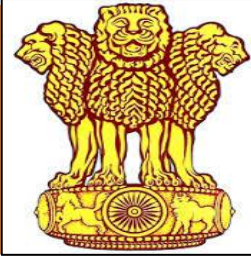


Protective Textile



Available Standards



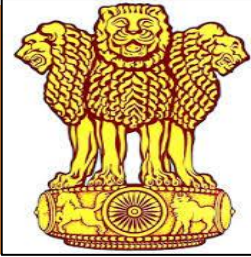


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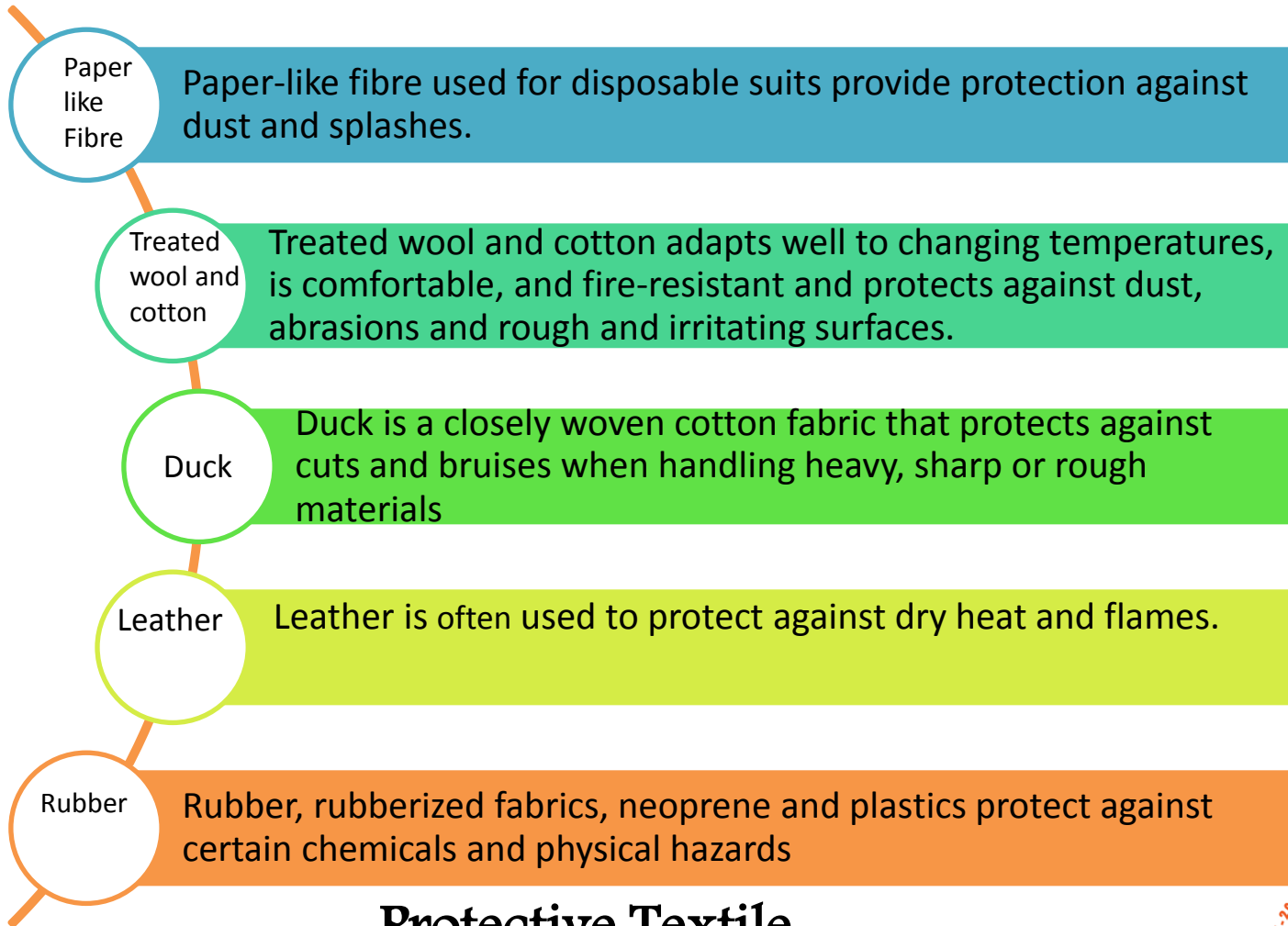
NFPA-70	NFPA-2112/3	NFPA-652
<p><i>Employees shall wear arc-rated clothing wherever there is possible exposure to an arc flash above the threshold incident-energy level for a second degree burn..."</i></p>	<p><i>"The standard shall specify the minimum performance requirements and test methods for Flame Resistant fabrics(Garments*) and components and the design and certification requirements for garments for use in areas at risk from flash fires.</i></p> <p><i>*NFPA-2113</i></p>	<p><i>When flame-resistant clothing is required for protecting personnel from flash fires, it shall comply with the requirements of NFPA 2112," and that "Flame-resistant garments shall be selected, procured, inspected, worn, and maintained in accordance with NFPA 2113."</i></p>

Protective Textile





OSHA



Protective Textile



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S
O

ISO/TC 94/SC 13 Protective clothing

61 published ISO standards * under the direct responsibility of ISO/TC 94/SC 13

16 ISO standards under development * under the direct responsibility of ISO/TC 94/SC 13

Protective Textile



Reference	Title
ISO/TC 94/SC 13/WG 1	General properties
ISO/TC 94/SC 13/WG 3	Protective clothing against chemicals agents
ISO/TC 94/SC 13/WG 6	Protective clothing against hazardous biological agents
ISO/TC 94/SC 13/WG 5	Protective clothing against mechanical action
ISO/TC 94/SC 13/WG 8	Standardization for protective gloves
ISO/TC 94/SC 13/WG 2	Test methods on exposure to heat with or without flame

[Link to standards](#)

Protective Textile





Oil Industry Safety Awards



THANK YOU

What is aramid?



Aramid fibers are man-made high-performance fibers, with molecules that are characterized by relatively rigid polymer chains. These molecules are linked by strong hydrogen bonds that transfer mechanical stress very efficiently, making it possible to use chains of relatively low molecular weight.

The term “aramid” is short for “aromatic polyamide”. Aromatic polyamides were first applied commercially as meta-aramid fibers in the early 1960s, with para-aramid fibers being developed in the 1960s and 1970s.

Aramid fibers share some general characteristics that distinguish them from other synthetic fibers:

High strength

Good resistance to abrasion

Good resistance to organic solvents

Non-conductive

No melting point

Low flammability

Good fabric integrity at elevated temperatures



Protective Textile

