Kemmetech
Manufacturing Specialist Vinyl Materials

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KEMMETECH RADIATION PROTECTION MATERIALS

PRODUCT SPECIFICATION AND TECHNICAL DATA FOR LEAD AND LEAD-FREE VINYL

Kemmetech flexible lead and lead-free vinyl radiation protection sheeting is a safe and effective medium for protecting people against the harmful effects of radiation emissions. The product range includes lead equivalent values of 0.125mm, 0.167mm, 0.175mm, 0.25mm, 0.35mm, 0.50mm, 0.70mm and 1.00mm depending on the level of protection required. These may be stitched, bonded or welded together in a multi-layer construction to offer higher protective values.

The range of materials are available in four main grades:

- Standard Vinyl
- Skinned Vinyl
- High Strength Vinyl
- Reinforced Vinyl

All products are available in Standard Lead, Lightweight Lead, Superlight Lead Composite, or Lead–free composite as required.

Special products may also be tailor-made by arrangement, for example; specific lead equivalency, special house colours, non-standard widths and in non-standard skinned or unskinned versions.

APPLICATIONS

Kemmetech flexible lead and lead-free vinyl sheeting forms the basic radiation shielding element used in a number of protective garments and products supplied via converters and distributors to theMedical, Dental, Veterinary, Nuclear and X-ray Scanning Equipment Industries. Unskinned Material Skinned Material High Strength Vinyl Reinforced Material X-Ray Aprons X-Ray Aprons Security X-Ray Scanners Security X-Ray Scanners.

Unskinned Material	Skinned Material	High Strength Vinyl	Reinforced Material
X-Ray Aprons	X-Ray Aprons	Security X-Ray Scanners	Security X-Ray Scanners
Gloves & Accessories	Theatre Room Table Covers	X-Ray Scanners (Food)	Curtains & Screens (Enclosures)
Radiation Blankets	Strip Curtains	Strip Curtains	Radiation Blankets (Nuclear)
Protective Barriers	X-Ray Scanners (Food)	Protective barriers	Mobile X-Ray Units

COMPOSITION

Kemmetech Radiation Protection Materials (depending on the exact grade) are composed of emulsion polymers, plasticisers, finely divided lead/lead-free metal particles, stabilisers and pigments.

The unique manufacturing process involves a single, or multi-layer construction, that produces a homogenous sheet. This ensures an even distribution of the specially graded pure lead, or other metal particles (Lead-free and composite), within the vinyl matrix and therefore a consistent level of protection throughout the sheeting.

High Strength Vinyl is produced primarily for curtains within security scanners. It is formulated to provide an extremely strong material with good wear characteristics that will not stretch, or distort, in use. The material has a low friction surface to further limit wear due to abrasion from objects passing through the scanner.

Reinforced material is a multi-layer product, incorporating a reinforcing polyester scrim, which provides additional strength and support for larger suspended curtains or barriers.

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PROTECTIVE VALUES & SPECIFICATIONS

STANDARD VINYL MATERIALS – LEAD AND LEAD-FREE

Lead Equivalent Value BS3783	Colour	Emboss Finish	Thickness (nominal)	Weight (Target)	Standard Widths	Standard Roll Length
0.125mm Standard	Natural	One side	0.47mm	1.85Kg/M²	1200mm	20M
0.167mm Standard	Natural	One side	0.62mm	2.47Kg/M²	1200mm	20M
0.175mm Standard	Natural	One side	0.65mm	2.60Kg/M²	1200mm	15M
0.250mm Standard	Natural	One side	0.92mm	3.70Kg/M²	1200mm	15M
0.125mm Lightweight	Black	One side	0.41mm	1.72Kg/M²	1200mm	20M
0.167mm Lightweight	Black	One side	0.55mm	2.30Kg/M²	1200mm	20M
0.175mm Lightweight	Black	One side	0.58mm	2.41Kg/M²	1200mm	15M
0.250mm Lightweight	Black	One side	0.82mm	3.45Kg/M²	1200mm	15M
0.125mm Superlight	Natural	One side	0.40mm	1.50Kg/M²	1200mm	20M
0.167mm Superlight	Natural	One side	0.53mm	2.00Kg/M²	1200mm	20M
0.175mm Superlight	Natural	One side	0.56mm	2.10Kg/M²	1200mm	15M
0.250mm Superlight	Natural	One side	0.80mm	3.00Kg/M²	1200mm	15M
0.125mm Lead-free	Natural	One side	0.47mm	1.50Kg/M²	1200mm	20M
0.167mm Lead-free	Natural	One side	0.62mm	2.00Kg/M²	1200mm	20M
0.175mm Lead-free	Natural	One side	0.65mm	2.10Kg/M²	1200mm	15M
0.250mm Lead-free	Natural	One side	0.92mm	3.00Kg/M²	1200mm	15M

SKINNED AND STRENGTHENED VINY MATERIALS – LEAD AND LEAD-FREE

Lead Equivalent Value BS3783	Colour Skin./Strength.	Emboss Finish	Thickness Skinned/Strength.	Weight Lead/Free/Strength.	Standard Widths	Standard Roll Length
0.125mm Standard	Select*/Black	Two sides	0.95mm / 0.73mm	2.33 / 1.98 / 2.15 Kg/M²	600 to 1200mm	20M
0.175mm Standard	Select*/Black	Two sides	1.13mm / 1.02mm	4.18 / 3.48 / 3.00 Kg/M²	600 to 1200mm	20M
0.250mm Standard	Select*/Black	Two sides	1.40mm / 1.46mm	4.18 / 3.48 / 4.30 Kg/M²	600 to 1200mm	20M
0.350mm Standard	Select*/Black	Two sides	1.78mm / 2.05mm	5.66 / 4.68 / 6.00 Kg/M²	600 to 1200mm	15M
0.500mm Standard	Select*/Black	Two sides	2.30mm / 2.92mm	7.88 / 6.48 / 8.60 Kg/M²	600 to 1200mm	12M
0.700mm Standard	Select*/Black	Two sides	3.08mm / 4.10mm	10.84 / 8.88 / 12.00 Kg/M²	600 to 1000mm	10M
1.000mm Standard	Select*/Black	Two sides	3.76mm / 5.85mm	14.10 / 12.48 /17.20 Kg/M²	600 to 650mm	5M

**Customers may select colour, or colour match as required – subject to a minimum order quantity*

REINFORCED LEAD VINYL MATERIALS (POLYESTER REINFORCED)

Lead Equivalent Value BS3783	Colour	Emboss Finish	Thickness (nominal)	Weight (Target)	Standard Widths	Standard Roll Length
0.275mm Standard	Black	One side	1.6mm	5.0Kg/M²	600 to 1200mm	10M / 50M*
0.400mm Standard	Black	One side	2.4mm	7.2Kg/M²	600 to 1200mm	10M / 50M*
0.450mm Standard	Black	One side	2.7mm	8.0Kg/M²	600 to 1200mm	10M / 50M*

** 50M rolls supplied in special crates (2 to a crate) with roll bars for easy handling and dispensing.*

NOTES TO PROTECTIVE VALUES AND SPECIFICATIONS

1 All weights and measurements carry a +/- 10% tolerance.

2. Lead equivalent value test certificates are supplied for each consignment of Kemmetech lead/lead-free vinyl.

3. All grades of materials are supplied without casting paper, but may be supplied on casting paper at an additional charge.

4. Unskinned materials are supplied untrimmed along edges and skinned materials trimmed, as standard.

5. Technical data on special products available upon request.

PHYSICAL PROPERTIES

STANDARD VINYL MATERIALS

Tensile Strength (MN/M²)	Tensile Strength (MN/M²)	Tear Strength (N/M²)	Elongation at Break
0.125mm Standard	Length 4.40 / Width 4.40	Length 9700 / Width 9650	Length 250% / Width 250%
0.167mm Standard	Length 4.45 / Width 4.45	Length 10300 / Width 10100	Length 260% / Width 260%
0.175mm Standard	Length 4.55 / Width 4.55	Length 11500 / Width 10400	Length 275% / Width 275%
0.250mm Standard	Length 5.20 / Width 5.20	Length 12800 / Width 12800	Length 250% / Width 250%
0.125mm Lightweight	Length 4.40 / Width 4.40	Length 8900 / Width 8900	Length 250% / Width 250%
0.167mm Lightweight	Length 4.45 / Width 4.45	Length 9700 / Width 9700	Length 250% / Width 250%
0.175mm Lightweight	Length 4.55 / Width 4.55	Length 9900 / Width 9900	Length 250% / Width 250%
0.250mm Lightweight	Length 5.20 / Width 5.20	Length 10900 / Width 10800	Length 250% / Width 250%
0.500mm Lightweight	Length 7.80 / Width 7.80	Length 12200 / Width 12200	Length 225% / Width 225%
0.125mm Superlight	Length 4.30 / Width 4.30	Length 8700 / Width 8700	Length 250% / Width 250%
0.167mm Superlight	Length 4.40 / Width 4.40	Length 9300 / Width 9300	Length 250% / Width 250%
0.175mm Superlight	Length 4.55 / Width 4.55	Length 9500 / Width 9500	Length 250% / Width 250%
0.250mm Superlight	Length 5.10 / Width 5.10	Length 11200 / Width 11200	Length 250% / Width 250%
0.125mm Lead-free	Length 4.40 / Width 4.40	Length 8700 / Width 8700	Length 250% / Width 250%
0.167mm Lead-free	Length 4.45 / Width 4.45	Length 9300 / Width 9300	Length 250% / Width 250%
0.175mm Lead-free	Length 4.55 / Width 4.55	Length 9500 / Width 9500	Length 250% / Width 250%
0.250mm Lead-free	Length 5.20 / Width 5.20	Length 11200 / Width 11200	Length 250% / Width 250%

SKINNED AND STRENGTHENED VINY MATERIALS – LEAD AND LEAD-FREE

Tensile Strength (MN/M²)	Tensile Strength (MN/M²)	Tear Strength (N/M²)	Elongation at Break
0.125mm Standard	Length 6.74 / Width 6.85	Length 44750 / Width 52500	Length 290% / Width 295%
0.250mm Standard	Length 5.88 / Width 5.99	Length 42850 / Width 50500	Length 280% / Width 285%
0.350mm Standard	Length 5.00 / Width 5.04	Length 38000 / Width 44500	Length 260% / Width 265%
0.500mm Standard	Length 3.90 / Width 3.92	Length 21000 / Width 22000	Length 230% / Width 240%
0.700mm Standard	Length 3.50 / Width 3.60	Length 14750 / Width 15500	Length 215% / Width 220%
1.000mm Standard	Length 2.99 / Width 3.08	Length 8500 / Width 9000	Length 200% / Width 210%

REINFORCED LEAD VINYL MATERIALS (POLYESTER REINFORCED)

Tensile Strength (MN/M²)	Tensile Strength (MN/M²)	Tear Strength (MN/M²)	Elongation at Break
0.275mm Standard/Galena (Polyester Reinforced)	Length 557 / Width 509	Length 500 / Width 500	Length 100% / Width 100%
0.400mm Standard/Galena (Polyester Reinforced)	Length 750 / Width 700	Length 500 / Width 500	Length 100% / Width 100%
0.450mm Standard/Galena (Polyester Reinforced)	Length 950 / Width 850	Length 500 / Width 500	Length 100% / Width 100%

NOTES TO PROTECTIVE VALUES AND SPECIFICATIONS

The Lead and Lead-free vinyl data is strictly a guideline only. Customers must satisfy themselves that the material is suited to their requirements for the intended purpose and tested accordingly both in process and in the final application of use.

HEALTH & SAFETY

The lead/lead-free metal particles are firmly bound within the vinyl structure ensuring that oxidisation of the lead/lead-free metal and therefore absorption through the skin is not possible. However, ingestion of the materials would have a harmful affect and should be avoided.

FIRE PRECAUTIONS & WASTE DISPOSAL

Due to the high content of metallic lead contained in the lead sheeting any waste lead vinyl material should be disposed of in registered landfill sites in accordance with Local Authority regulations.

The material should not be disposed of by incineration and use of self-contained breathing apparatus is recommended if the sheeting is ignited by an internal fire.

Alternatively, Kemmetech will accept for safe disposal, the return of any customers' waste Kemmetech lead vinyl material by prior arrangement.

Lead-free waste material is environmentally friendly and may be disposed via standard disposal methods. No special or registered disposal/landfill sites are required. No toxic ingredients.

FLAMMABILITY: The lead/lead free vinyl material will burn in the presence of fire but is self-extinguishing when the flame is removed

EXTINGUISHING MEDIA: Dry chemical, carbon-dioxide foam or water

PACKAGING, HANDLING, STORAGE & FURTHER PROCESSING

Kemmetech lead/lead-free vinyl is packed/labelled in individual rolls (in roll lengths as agreed) and supplied shrunk-wrapped on wooden pallets.

The raw material/finished garment should be transported and stored in clean and dry conditions at ambient temperature and kept away from high temperature, moisture and humid conditions. Do not leave in direct contact with heated surfaces. Rolls of material should be laid-down flat off the ground and care should be taken to avoid crushing the rolls. It is a highly flexible material, which is easy to handle, stitch and cut by hand, or automatic cutting tools. Any adhesives used in the further processing of lead/lead-free vinyl should have a high resistance to plasticiser migration to ensure long-term bonding and should be thoroughly tried and tested by the customer.

Kemmetech recommends the use of silica gel bags at all stages of manufacture through to the storage of the finished aprons to help prevent any build up of moisture.

RECOMMENDATIONS FOR PACKING SPECIFICATIONS LONG HAUL EXPORT

Kemmetech suggests that the following recommendations should be applied to all lead vinyl sheet exports destined for Asia, the Middle or Far East and any area that may experience high levels of humidity and heat. 4-way, heat-treated and debarked wooden crates (to those countries which specify treated wood) otherwise untreated crates may be used for long haul exports (2-way would be suitable but 4-way enable easier packing and stacking in transit) These should be made to the size and specifications of the material to be supplied. Each should be strong enough to carry 1000kgs cargo. As standard, each crate should be lined with foam for extra protection and then inner sealed with shrink-wrap. Each roll of lead vinyl will be wrapped on a pre-dried core. The external packing of the crate should be clearly and visibly marked.

KEEP AWAY FROM MOISTURE – DO NOT GET WET

Heat and humidity during transportation as laid down by the ICTT should not exceed 50ºC and no higher than 80% relative humidity.

TECHNICAL INFORMATION & PRODUCT TESTING

The technical information given in this data sheet is accurate to the best of our knowledge and is intended as a guide. Kemmetech guarantee/certify materials supplied to given lead equivalent values and production specification criteria within acceptable tolerances. This guarantee does not extend to any further processing carried out by customers or end users. Therefore, customers/end users are advised to test materials under their own conditions of use to satisfy themselves as to their suitability.

TECHNICAL INFORMATION & SAMPLES

The above information is accurate to the best of our knowledge and is intended as a guide to users. Since applications may vary greatly, customers are advised to test the materials under their own conditions of use to satisfy themselves of their suitability. Should you require any further information or samples, please contact Kemmetech on +44 (0)1622 872724, or by email to info@kemmetech.co.uk

KEMMETECH LTD.
May 2012