












# THERMAL INSULATION SPECIFICATION GUIDE

## RECOMMENDED LEVELS OF INSULATION TO ACHIEVE DEEMED-TO-SATISFY RULE FOR ENERGY EFFICIENCY IN ROOF/CEILING, WALL & FLOOR CONSTRUCTIONS – SANS 10400-XA: 2021

CONSTRUCTION TYPE					ROOFS		EXTERNAL WALLS			FLOORS				
					Cathedral ceiling or flat ceiling		50 mm Cavity Surface density >270kg/m²	Light Weight Walls Surface density <270kg/m²		Suspended Floors		Concrete Slab	Under Floor Heating	
Energy Zones					1, 2, 3, 4, 5, 6 & 7	5H	1, 2, 4, 6 & 7	1,2,6 & 7	3, 4, 5 & 5H	1, 2, 6 & 7	3, 4 & 5	1, 2, 6 & 7	If used	
Minimum Thermal Resistance required - Total R-value m²K/W					3.7	2.7	Recommended	2.2	1.9	1.5	1	1	1	
Total R-value of roof & ceiling materials / other materials					0.35	0.39	To Be Determined (TBD)	TBD	TBD	TBD	TBD	TBD	TBD	
Minimum added R-value required m²K/W					3.35	2.31		2.2	1.9	1.5	1	1	1	
Generic Insulation		Density kg/m³	Thermal Conductivity k-Value	Reaction To Fire SANS 428	Photo	Recommended minimum intervention levels (thickness in mm) of thermal insulation materials to be used. Thermal Conductivity values used are generic. All properties should be verified with individual manufacturers. NS - Properties that are not stated (NS) may or may not be an indication that a material is not appropriate for the applications. ck – Check SANS 10400-T for suspended floors.								
Cellulose Fibre Bonded Batt		30	0.038	B		130	90	50	85	75	ck	ck	NS	NS
Cellulose Fibre Loose-fill		27.5	0.040	B		135	100	NS	NS	NS	ck	ck	NS	NS
Expanded Polystyrene (EPS) Rigid Board		15	0.035	B		120	80	50	80	70	ck	ck	35	NS
Extruded Polystyrene (XPS) Rigid Board		32	0.030	B		100	70	50	65	60	ck	ck	30	NS
Glass Wool (GW)Flexible Blanket		12-18	0.040	A		135	100	50	90	80	60	40	NS	40
Glass Wool (GW) Batt		47.5	0.033	A		115	80	50	75	65	50	35	NS	35
Polyester Fibre Flexible Blanket		10	0.051	B		170	120	50	115	100	ck	ck	NS	NS
Polyester Fibre Blend Batt		24-80	0.034-0.040	B		135	100	50	90	80	ck	ck	NS	NS
Polyisocyanurate (PIR) Rigid Board		34	0.024	B		80	60	50	55	50	ck	ck	25	NS
Rock/Stone Wool Batt		40-160	0.033	A		115	80	50	7	65	50	35	NS	35
Reflective Foil Laminate Roll (RFL)		ε	N/A	B		All tiled roofs in energy zones 1, 2, 4, 6, and 7 shall have a tile underlay or radiant barrier and installed in accordance with the manufacturers installation specifications. Manufacturers can also supply vapour barriers for floors/walls. Additional bulk insulation is required to comply with the thermal resistance requirements of SANS 10400-XA.								

KEY & NOTES: 1. Zone 5H high humidity to be taken into account.

2. All properties listed are for the core insulation materials only and may not be indicative of the performance of an insulation system, including vapour retarders, adhesives and sealants.

3. Thermal efficiencies are dependent on material thickness, blowing agent, density, age, operating temperature and moisture. Always use aged values for design purposes.

4. Reaction to Fire Rating: A=Non-Combustible B=Combustible.

5. Manufacturers will round off thicknesses to nearest production standard.

6. Rational design is always an option. Consult with a Competent Person.



**SAFETY ALERT – CEILING INSULATION:** Heat-producing fixtures should be isolated from the thermal insulation to prevent fire hazards. These include recessed lighting fixtures. Install non-combustible downlight protection covers, to protect the insulation. **PROHIBITED PRACTICES:** FIRE SAFETY is the number one priority! DO NOT use two combustible insulation products in conjunction with one another to form a composite, for example; a combustible rigid board with a combustible flexible fibre blanket, to comply with the required thermal resistance in SANS 10400-XA Energy usage in buildings, unless it has a valid fire report to verify that it was tested together and can be used as such.



**Disclaimer:** All information, recommendation or advice contained in this TIPSASA publication is given in good faith to the best of our knowledge and based on current standards and regulations in effect. TIPSASA cannot be held responsible for any loss incurred through incorrect or faulty use of its Publications. No responsibility will be accepted by TIPSASA for any errors and/or omissions, which may have inadvertently occurred. © Tel: 0861 000 334. Mobile: 082 305 8559 Website: [www.tipsasa.co.za](http://www.tipsasa.co.za) Publication: November 2021.

SANS 10400-A General Principles and Requirements Regulation A20 Classification and Designation of Occupancies as per Energy Efficiency Regulation XA and SANS 10400-XA Energy usage in buildings.

Reaction to Fire Rating Requirement SANS 428

Occupancy	Reaction to Fire Rating Requirement SANS 428
A1	Entertainment & public assembly
A2	Theatrical and indoor sport
A3	Places of instruction
A4	Worship
C1	Exhibition hall
C2	Museum
E1	Place of detention
E2	Hospital
E3	Other institutional (residential)
E4	Health care
F1	Large shop
F2	Small shop
F3	Wholesalers' store
G1	Offices
H1	Hotel
H2	Dormitory
H3	Domestic residence
H4	Dwelling house
H5	Hospitality

#### PIPE INSULATION

Internal Ø of pipe	≤ 80mm	> 80mm
R-Value Required m <sup>2</sup> K.W	1	1.5
Expanded Polystyrene (EPS)	35	55
Glass Wool	40	60
Polyester	60	80
Polyurethane	25	40

All exposed pipes to and from hot water cylinders & central heating systems shall be insulated with pipe insulation.