












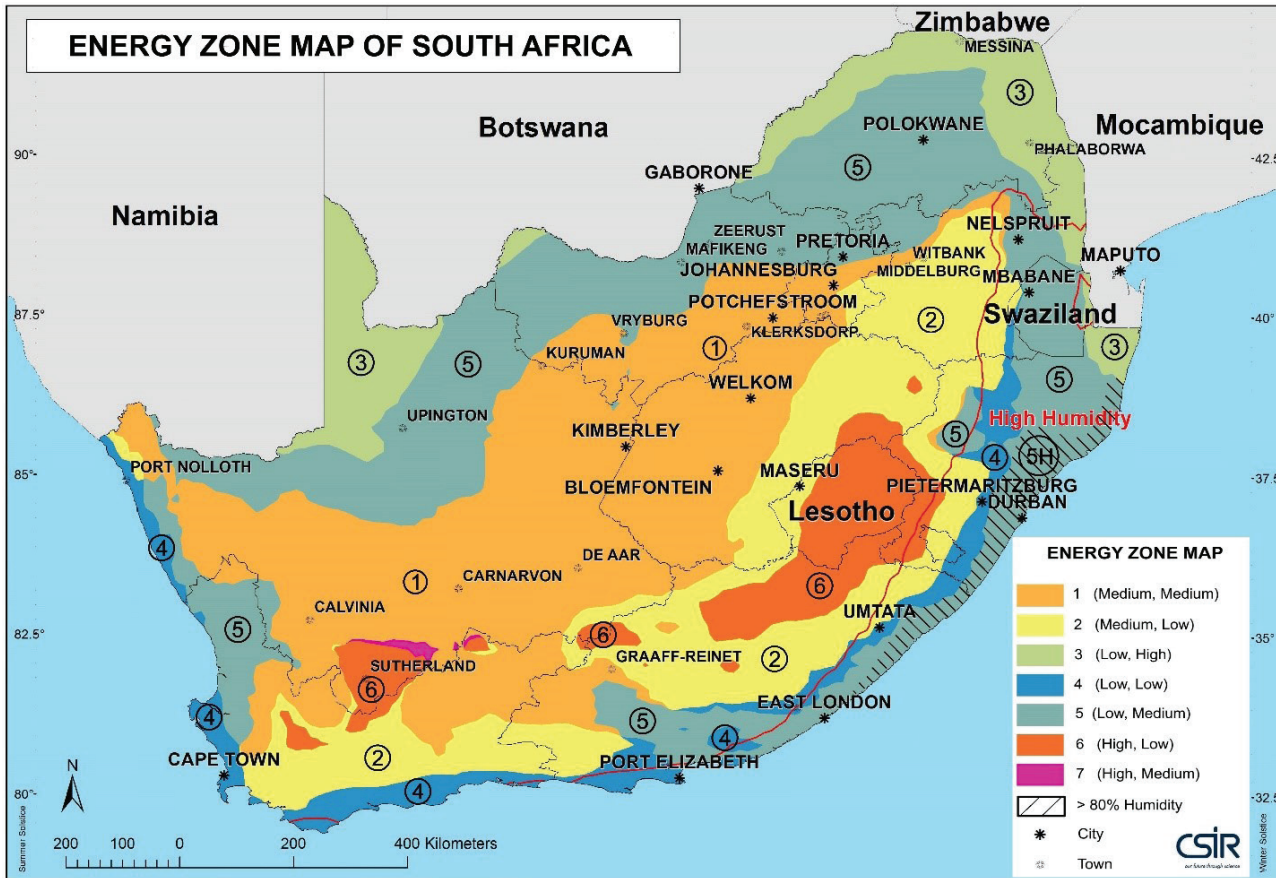
## RECOMMENDED LEVELS OF INSULATION TO ACHIEVE DEEMED-TO-SATISFY RULE FOR ENERGY EFFICIENCY IN ROOF/CEILING, WALL & FLOOR CONSTRUCTIONS – SANS 10400-XA

CONSTRUCTION TYPE				ROOFS		EXTERNAL WALLS			FLOORS			
				Cathedral ceiling or flat ceiling		50 mm Cavity Surface density >270kg/m <sup>2</sup>	Light Weight Walls Surface density <270kg/m <sup>2</sup>		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 m <sup>2</sup> K/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 m <sup>2</sup> K/W				3.35	2.31		2.2	1.9	1.5	1	1	1
Generic Insulation	Density kg/m <sup>3</sup>	Thermal Conductivity k-Value	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		130	90	50	85	75	ck	ck	NS	NS
Cellulose Fibre Loose-fill	27.5	0.040		135	100	NS	NS	NS	ck	ck	NS	NS
Expanded Polystyrene (EPS) Rigid Board	15	0.035		120	80	50	80	70	ck	ck	35	NS
Extruded Polystyrene (XPS) Rigid Board	32	0.030		100	70	50	65	60	ck	ck	30	NS
Glass Wool (GW) Flexible Blanket	12-18	0.040		135	100	50	90	80	60	40	NS	40
Glass Wool (GW) Batt	47.5	0.033		115	80	50	75	65	50	35	NS	35
Polyester Fibre Flexible Blanket	10	0.051		170	120	50	115	100	ck	ck	NS	NS
Polyester Fibre Blend Batt	24-80	0.034-0.040		135	100	50	90	80	ck	ck	NS	NS
Polyisocyanurate (PIR) Rigid Board	34	0.024		80	60	50	55	50	ck	ck	25	NS
Rock/Stone Wool Batt	40-160	0.033		115	80	50	75	65	50	35	NS	35
Reflective Foil Laminate Roll (RFL)	ε	N/A		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 Energy Efficiency.



**COMPULSORY** installation of thermal insulation  
In the following Building Occupancy Classes (Regulation A20)  
in accordance with the National Building Regulations,  
Part XA Energy usage in buildings and Regulation XA1.



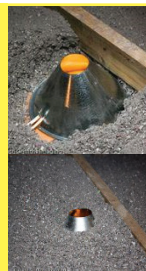
A1	Entertainment & public assembly	F1	Large shop
A2	Theatrical and indoor sport	F2	Small shop
A3	Places of instruction	F3	Wholesalers' store
A4	Worship	G1	Offices
C1	Exhibition hall	H1	Hotel
C2	Museum	H2	Dormitory
E1	Place of detention	H3	Domestic residence
E2	Hospital	H4	Dwelling house
E3	Other institutional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

List of Major Cities and Towns by Energy Zones  
In Alphabetical Order (for full list see SANS 10400-XA)

City/Town	Province	Energy Zone	SCCP
Bloemfontein	Free State	1	No
Cape Town	Western Cape	4	Yes
Durban	KwaZulu-Natal	5H	No
East London	Eastern Cape	5	No
Emalaheni	Mpumalanga	2	No
George	Western Cape	4	Yes
Gqeberha (PE)	Eastern Cape	4	Yes
Johannesburg	Gauteng	1	No
Mbombella	Mpumalanga	5	No
Mosselbaai	Western Cape	4	Yes
Pietermarizburg	KwaZulu-Natal	4	No
Polokwane	Limpopo	5	No
Potchefstroom	North West	1	No
Pretoria	Gauteng	5	No
Umtata	Eastern Cape	4	No
Upington	Northern Cape	5	No



**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.



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