



FELT:

The Versatile Design Solution

A Technical Brochure
Of Wool & Synthetic Fiber Felts
Produced By
The Felt Council

WOOL FELTS – ROLL

Commercial Standard Grade SAE Number NTA Number	16R1 F-1 34R1	16R1X F-50 34R1	16R2 F-2 34R2	16R3 F-3 34R3	16R3X F-51 34R3
GENERAL PROPERTIES					
Wool Content (fiber basis), min. %	95	95	90	85	92
Density (1"), lbs/sq yd	16.00	15.60	16.00	15.60	15.60
Standard Thickness Range, in.	1/8 to 1	3/64 to 3/32	1/8 to 1	1/8 to 1	3/64 to 3/32
Standard Width, in.	60	60 or 72	60	60	60 or 72
Color	white	white	any but gray or black	gray	gray
PHYSICAL PROPERTIES					
Specific Gravity (%)	34	34	34	34	34
Therm. Cond. (70F), btu/hr/sq ft/°F/in.	0.36	0.32	0.36	0.35	0.32
Thermal Expansion	0	0	0	0	0
Air Perm (1/16"), cfm/sq ft/0.5"H ₂ O	10 - 30	15 - 25	10 - 30	15 - 35	15 - 40
Liquid Absorption, % by weight (1.0 sp gr)	> 175	> 180	> 175	> 190	> 170
by volume	74	75	74	76	75
Capillarity (wicking height, 575 SSU, 70F), in.	4.0	4.0	4.0	4.0	4.0
Coef of Friction ⁽¹⁾	0.37	0.37	0.37	0.37	0.37
Vibration Absorption ⁽²⁾					
static load bearing cap/unit area	high	—	high	high	—
dynamic stress endurance	high	—	high	high - med	—
Noise Reduction Coef (1")	0.50	0.55	0.50	0.52	0.55
MECHANICAL PROPERTIES					
Tensile Strength (min), psi	500	500	500	400	300
Elongation (100 psi), %	13	8	14	16	9
Mullen Bursting Strength (1/8"), psi	250	225	225	200	225
Split Resistance (min), lb/2" width	33	—	28	22	—
Hardness Range, Shore A	30 - 40	—	30 - 40	30 - 40	—
Compressibility (10% defl), psi	21	—	21	13	—
Recovery (within 1 min after 10% defl) %	99	99	99	99	99
Abrasion Resistance ⁽³⁾	excellent	excellent	excellent	excellent	excellent
CHEMICAL AND ENVIRONMENTAL PROPERTIES					
Effect of Sunlight and Oxidation	none	none	none	none	none
Solvent Resistance and Stability in Oil	excellent	excellent	excellent	excellent	excellent
Acid Resistance, dilute	excellent	excellent	excellent	excellent	excellent
concentrated	good - fair	fair - good	good - fair	good - fair	fair - good
Alkali Resistance, dilute	fair	fair	fair	fair	fair
concentrated	low	low	low	low	low
Temperature Range, °F	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200
TYPICAL USES					
	Bearing seals, ink rolls, polishing, printing pads, lubricator wicks, and precision uses where high grade felt with good appearance and durability is required.	Ball and roller bearing precision seals, strip wicks, industrial filters and uses requiring thin precision felt.	Vibration mounts precision channels, oil seals, bumpers gaskets, and lubricator wicks.	Automotive, aircraft, machine components: Similar to 16R1 and 16R2, where lower quality is acceptable.	Gaskets, liners, bearing seals, where precision tolerances, life and quality are not as exacting.

The above materials are non-raveling and most can be fabricated by: die-cutting, stripping, skiving, laminating, coating, impregnating, stitching, stapling, perforating, cementing, machining, grinding, drilling, molding, shaping, and extruding.

Note: Data given are obtained by ASTM D-461 Test Methods, ASTM D 2475 Standards, and NTA Wool Felt Specifications.

(1) Depends on the condition of the contact surface and is subject to moderate control by altering the felt's finish surface.

(2) Up to 85% absorption under appropriate design conditions.

(3) Increases with density.

12R1 F-5 26R1	12R2 F-6 26R2	12R3 F-7 26R3	12R3X F-55 26R3	9R1 F-10 18R1	9R2 F-11 18R2	9R3 F-12 —	9R4 F-13 18R3
95	87	80	75	95	87	85	75
12.24	12.24	12.24	12.00	8.48	8.48	8.48	8.48
1/8 to 1	1/8 to 1	1/8 to 1	1/16 to 3/32	1/8 to 1	1/8 to 1	1/8 to 1	1/8 to 1
60	60 or 72	72	60 or 72	72	72	72	72
white	gray	gray	gray/black	white	gray	gray	gray
26	26	26	26	18	18	18	18
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24
0	0	0	0	0	0	0	0
20 - 50	20 - 50	20 - 50	20 - 50	75 - 150	75 - 150	75 - 150	75 - 150
> 250	> 225	> 225	> 225	> 400	> 375	> 350	> 350
80	80	80	81	88	88	88	88
3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
medium	medium	medium	—	low	low	low	low
high	high	medium	—	high	high - medium	medium	low
0.58	0.58	0.58	0.58	0.58	0.64	0.64	0.64
400	275	250	200	225	200	100	75
16	18	21	25	33	35	35	37
175	150	125	200	75	60	55	50
18	16	12	—	8	6	3	2
20 - 30	20 - 30	20 - 30	—	15 - 25	15 - 25	15 - 25	15 - 25
6	6	6	—	4	4	3	3
99	99	99	99	99	99	99	99
good	good	good	good	fair	fair	fair	fair
none	none	none	none	none	none	none	none
excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
excellent	excellent	good	good	excellent	excellent	good	fair
good - fair	good - fair	fair	fair	fair - good	fair - good	fair - good	fair
fair	fair	fair	fair	fair	fair	fair	fair
low	low	low	low	low	low	low	low
- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200
Lubricators, wipers, shock dampeners, where durable resilient felt is required.	Grease retainers, spacer strip seals, vibration mounts, weather strips, journal lubricators.	Dust shields, oil and grease retainers; similar to 12R1 and 12R2 where a lower grade is acceptable.	Antisqueak strips, antidrums and insulation lining laminated to other materials.	Fluid storage and delivery, resilient padding, plug filters for gas and air.	Dryer drum seals, impregnated packing, insoles, insulation; oil, dust and mud shields.	Chassis strips, spacers, dash liners, anti-squeak strips and pads, sound deadening and acoustic uses.	Grease and oil protective lining on freight cars, trucks uses similar to 9R4 where less durable grade felt is acceptable.

9R1 F-10 18R1	9R2 F-11 18R2	9R3 F-12 —	9R4 F-13 18R3	9R5 F-15 —	8R5 F-26 17R2
95	87	85	75	55	45
8.48	8.48	8.48	8.48	8.48	7.20
1/8 to 1	1/8 to 1	1/8 to 1	1/8 to 1	1/8 to 1	1/8 to 1
72	72	72	72	72	72
white	gray	gray	gray	gray	gray
18	18	18	18	18	17
0.30	0.24	0.24	0.24	0.24	0.25
0	0	0	0	0	0
75 - 150	75 - 150	75 - 150	75 - 150	75 - 150	100 - 200
> 400	> 375	> 350	> 350	> 350	> 400
88	88	88	88	88	92
2.5	2.5	2.5	2.5	2.5	—
0.37	0.37	0.37	0.37	0.37	0.37
low	low	low	low	low	very low
high	high - medium	medium	low	low	very low
0.58	0.64	0.64	0.64	0.64	0.65
225	200	100	75	75	—
33	35	35	37	39	—
75	60	55	50	40	25
8	6	3	2	2	—
15 - 25	15 - 25	15 - 25	15 - 25	15 - 25	5 - 15
4	4	3	3	3	1
99	99	99	99	99	99
fair	fair	fair	fair	fair	poor
none	none	none	none	none	none
excellent	excellent	excellent	excellent	excellent	excellent
excellent	excellent	good	fair	fair	fair
fair - good	fair - good	fair - good	fair	fair	poor
fair	fair	fair	fair	fair	fair
low	low	low	low	low	low
- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200	- 80 to + 200
Fluid storage and delivery, resilient padding, plug filters for gas and air.	Dryer drum seals, impregnated packing, insoles, insulation; oil, dust and mud shields.	Chassis strips, spacers, dash liners, anti-squeak strips and pads, sound deadening and acoustic uses.	Grease and oil retention, protective lining and insulation for freight cars, trucks, dunnage, uses similar to 9R2 and 9R3 where less durability and lower grade felt is acceptable.		Packing or padding when held between other materials; not recommended for mechanical use.

SYNTHETIC FIBER FELTS – ROLL

Custom-Engineered Solutions For Your
Technical Design Needs.

AVAILABLE COMPOSITION (Fiber Basis), 100%	Polypropylene	Rayon	Polyester	Nylon	Nomex®	Teflon®
GENERAL PROPERTIES						
Available Fiber Deniers, per filament	1½ - 20	1½ - 15	2¼ - 25	3 - 15	2 - 10	6.67
Available Densities, 1" Nom Thick, lbs / sq yd	4 - 18	4 - 18	4 - 18	4 - 18	4 - 18	4 - 18
Available Thickness Range, in.	¼ - 1½	¼ - 1½	¼ - 1½	¼ - 1½	¼ - 1½	¼ - 1
Available Widths, in.	up to 144	up to 144	up to 144	up to 144	up to 144	72"
CHEMICAL & ENVIRONMENTAL PROPERTIES						
Temperature, °F, Max Service Condition under constant exposure	200°F	200°F	300°F	300°F	400°F	550°F
Effects of Acids & Alkalis	Excellent resistance to most dilute and concentrated acids and alkalis, with the exception of elevated temperature exposure to chlorosulfonic acid, concentrated nitric acid and certain oxidizing agents.	Hot dilute or cold concentrated acids disintegrate fiber. Strong alkaline solutions cause swelling and reduce fiber strength.	Good resistance to most mineral and organic acids at room temperature. Dissolves and partially decomposes in concentrated sulfuric acid. Resistance to weak alkalis at room temperature is good; to strong alkalis, moderate. Disintegrates in strong alkalis at boil.	Resists weak acids. Hot mineral acids cause degradation. Substantially inert in alkalis.	Unaffected by most acids, except some strength loss after long exposure to hydrochloric, nitric and sulfuric acids. Generally good resistance to alkalis.	Essentially inert to acids and alkalis.
Effects of Bleaches & Solvents	Resistant to bleaches and most solvents. Chlorinated hydrocarbons will cause swelling at room temperature.	Fiber attacked by strong oxidizing agents. Generally insoluble in common organic solvents.	Excellent resistance to bleaches and other oxidizing agents. Generally insoluble except in some phenolic compounds.	Can be bleached in most solutions. Generally insoluble in most organic solvents. Soluble in some phenolic compounds.	Unaffected by most bleaches and solvents.	Most chemically-resistant fiber known. The only known solvents are alkali metals and certain perfluorinated organic liquids at temperatures above 570 °F.
Resistance to Mildew, Aging, Sunlight, & Abrasion	Not attacked by mildew. Good resistance to aging and abrasion. Can be stabilized to give good resistance to direct sunlight.	Fiber attacked by mildew. Good resistance to sunlight, abrasion and aging.	Excellent resistance to mildew and aging. Good resistance to abrasion. Prolonged exposure to sunlight causes some fiber strength loss.	Excellent resistance to mildew aging and abrasion. Prolonged exposure to sunlight causes some deterioration.	Excellent resistance to mildew and aging. Prolonged exposure to sunlight causes some strength loss. Good abrasion resistance.	Not weakened by mildew. Excellent resistance to aging and sunlight. Good abrasion resistance.

TYPICAL USES

- Polypropylene:** Filtration, Wicks, Battery Separators, and product applications where good chemical resistance is required.
- Rayon:** Liquid absorbent materials, sound absorbent gaskets, water filters, fuel oil filter cartridge, and carbon precursor.
- Polyester:** Air filters, transmission filters, impregnated substrates, coated fabric substrates, seals, wicks, moisture pads, metal wiping, acid resistant pads, and liquid filtration.
- Nylon:** Abrasion resistant wipers, gaskets and filters for butane and natural gas.
- Nomex®:** High temperature filter, gasket and wiper applications; fire-resistant apparel lining.
- Teflon®:** High temperature filters, gaskets and wipers; corrosive gasketing applications; dust bags requiring excellent particle-release characteristics.

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