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Item	TPO Single Ply	Advantage - Disadvantage	Spray Polyurethane Foam - SPF	Advantage - Disadvantage
Monolithic - Seamless	installed with 5 ft. or 10 ft. wide rolls of membrane	**Disadvantage** - thousands of feet of welded seams in the field and seams at all curbs and penetrations	seamless	**Advantage -** no seams
Insulation attachment	Insulation or fleece back membrane is required to separate TPO from old roof	**Disadvantage -** requires fasteners to attach to deck resulting in holes through BUR	SPF is sprayed over the existing roof and fully adheres to the surface	**Advantage -** no fasteners required
Membrane attachment	screws used to secure insulation and rows of screws in every seam to hold membrane to deck	**Disadvantage in Retrofit -** existing built-up roof is punctured with thousands more holes	NO screws necessary Fully adhered to substrate	**Advantage -** no fasteners required
Wind Resistance	Typ. mechanically fastened leaving a majority of membrane loose	**Disadvantage -** billows up between fastener rows as a result of negative and positive wind pressures over and through the building	completely bonded to the substrate, in retrofit, additional fastening of substrate may be necessary	**Advantage -** no billowing or fluttering, superior wind resistance in hurricane force winds
Waterproof components	The 60 mil TPO membrane is waterproof	**Disadvantage** - punctures or failed seams in the TPO will allow water to enter the system	SPF is waterproof	**Advantage** - SPF does not need a coating to keep water out
Following the path of water leaks	Open space between the TPO membrane and insulation, and between the insulation and BUR	**Disadvantage -** If water leaks at a penetration or seam, it travels over the insulation and BUR membrane until it finds a hole in the BUR (likely at one of the thousands of screws) to leak onto the deck and into the building	SPF is 90% closed cell and forms a seal directly the BUR substrate. Leaks only occur at penetrations when foam bond is broken.	**Advantage -** No water can travel through SPF or over the BUR surface. Existing BUR does not leak at this time greatly reducing the probability of future leaks

Renewable	Once the TPO fails it must be replace. Membrane deterioration can be slowed with coating	**Disadvantage -** Coating application will not stop delaminating or stressed seams	SPF will remain completely intact as installed - SPF only degrades when exposed to UV	**Advantage -** the **c**oating **may** need to be renewed after 20 years.
Installation production	5 man crew = 5,000 to 7,000 SF per day - completely water tight	**Disadvantage** - detailing at curbs and penetrations slows production	5 man crew = 20,000 SF per day - completely water tight	**Advantage -** SPF roofing can be completed in half the time of TPO
Roof Assembly R Value	1/4" polyisocyanurate cover board **R value = 1 (**JM Invinsa)	**Disadvantage** - Effective R value reduced by thousands of screws	1-1/2" of SPF **R value = 9**	**Advantage** - greater R value and no screws to provide thermal bridging which reduces R value
Energy Efficiency	Installed over 4'x4' or 4'x8' board insulation with steel screws and plates	**Disadvantage** - allows air flow **through** insulation joints, air flow between TPO & insulation, heat transfer through screws and plates	Only air flow is OVER exterior surface of SPF / coating system	**Advantage** - no shrinkage in or mis-aligned iso boards leaving gaps for air flow, **no thermal bridging or shorts** from steel fasteners
Reflectivity CRRC 3 yr.	TPOs are not know for maintaining high reflectivity - **Carlisle @ 0.70 GAF @ 0.68**	**Disadvantage** - Reference CRRC ratings of TPO manufacturers	White acrylic coatings maintain better than average reflectivity **Accella @ 0.81**	**Advantage -** will wash cleaner during rain fall
Slip resistance	When wet, TPO is very slippery	**Neutral -**	SPF when wet, without granules, is as slippery as TPO	**Neutral -** without granules **Advantage -** with granules SPF is slip resistant, though reflectivity may be reduced - adds $.15/SF cost to SPF option
Overnight tie-offs	Perimeter of new roof membrane must be sealed off to old roof SPF or mastic	**Disadvantage** - Added cost and not always water tight in heavy rain	SPF seal to old BUR is water tight	**Advantage** - No lost time or materials at night tie off
Cost	As low as $2.45 / SF without insulation	**Advantage -** Less expensive materials	As low as $3.10 / SF with 1" of closed cell insulation	**Disadvantage** - more expensive materials

