



## FT-IR Sample Handling

# Sample Types Index, Methods, and Ratings

### RATINGS

Excellent Good Adequate

### KEY

\* capable of being ground  
† incapable of being ground

Transmission  
Transmission – IR Microscope  
Diffuse Reflectance  
Diffuse Reflectance – Si Carb Sampler  
Diffuse Reflectance – IR Microscope  
ATR  
ATR – IR microscope  
Specular Reflectance  
Specular Reflectance – IR Microscope

	Transmission	Transmission – IR Microscope	Diffuse Reflectance	Diffuse Reflectance – Si Carb Sampler	Diffuse Reflectance – IR Microscope	ATR	ATR – IR microscope	Specular Reflectance	Specular Reflectance – IR Microscope
Solids	Thermoplastic Polymers (can be melted)	Excellent	Excellent	Adequate			Good	Good	
	Thermoplastic Polymers (can't be melted)			Adequate			Good	Good	
	Soluble Polymers	Excellent					Good		
	Thin Polymer Films	Excellent	Excellent	Adequate			Good	Good	
	Thick Polymer Films			Adequate			Excellent		Good
	Flat, Smooth Polymers *	Excellent	Excellent	Adequate			Good	Good	Good
	Flat, Smooth Polymers †			Adequate			Good	Good	Good
	Irregularly Shaped Polymers *	Good	Excellent	Adequate			Excellent	Excellent	
	Irregularly Shaped Polymers †			Adequate			Good	Good	
	Thin, Dark Polymer Films	Good	Excellent	Adequate			Excellent	Excellent	
	Thick, Dark Polymer Films		Excellent	Adequate			Excellent	Excellent	
	Layered Polymer Films		Excellent				Good	Good	
	Thin Polymer Film on Reflective Substrates			Adequate			Good		Excellent
	Thick Polymer Film on Reflective Substrates			Adequate			Good		Excellent
	Organic Powders	Excellent	Excellent	Good			Good		
	Adhesives	Good	Good				Excellent	Excellent	
	Rubber		Good		Adequate		Excellent	Excellent	
	Thin Fibers	Good	Excellent				Good	Good	
	Thick Fibers	Good	Excellent				Good	Good	
	Surface Analysis	Good		Good			Excellent	Excellent	Good
Liquids	Free-Flowing Aqueous Solutions	Excellent					Excellent		
	Other Free-Flowing Liquids	Excellent					Excellent		
	Viscous Liquids	Excellent					Excellent		
Gas	Excellent								
	Gases (ppb to 100% concentration)	Excellent							

## Index of Sample Types

**POWDERS** – organic and inorganic solids that can be ground into a powder (2–5 micron particle size); Examples: chemicals, pharmaceuticals, crystalline materials, pigments, fibers, polymers and powders

**THERMOPLASTIC POLYMERS** – polymers that can be pressed into free-standing thin films

**SOLUBLE POLYMERS** – polymers that can be dissolved in a solvent or cast as a thin film

**THIN POLYMER FILMS** – free-standing polymer films that are not thermoplastic or soluble and are less than 50 microns thick

**THICK POLYMER FILMS** – free-standing polymer films that are not thermoplastic or soluble and are more than 50 microns thick

**REGULARLY SHAPED POLYMERS** – polymers, films, and plaques that are hard or soft with a smooth surface, capable of being ground, not thermoplastic or soluble and regularly shaped

**REGULARLY SHAPED POLYMERS** – polymers, films, and plaques that are hard or soft with a smooth surface, incapable of being ground, not thermoplastic or soluble and regularly shaped

**IRREGULARLY SHAPED POLYMERS** – polymers that are hard or soft with a rough or uneven surface, capable of being ground, not thermoplastic, or soluble and irregularly shaped; Examples: formed polymers, polymer beads and pellets

**IRREGULARLY SHAPED POLYMERS** – polymers that are hard or soft with a rough or uneven surface, incapable of being ground, not thermoplastic or soluble and irregularly shaped

**THIN, DARK POLYMERS** – carbon-filled polymers high in inorganic content that are not thermoplastic or soluble and less than 10 microns thick, such as carbon black

**THICK, DARK POLYMERS** – carbon-filled polymers high in inorganic content that are not thermoplastic or soluble and more than 10 microns thick

**LAYERED POLYMER FILMS** – polymers that contain two or more layers or thin or thick films; Examples: layered paints and packaging materials

**THIN POLYMER FILM ON REFLECTIVE SUBSTRATE** – polymer film on any kind of surface that reflects IR energy (usually metal) that is less than 15 microns thick; Examples: lubricants on hard disk media and layers on silicon wafers

**THICK POLYMER FILM ON REFLECTIVE SUBSTRATE** – polymer film on any kind of surface that reflects IR energy (usually metal) that is more than 15 microns thick; Examples: coatings on containers (such as soda cans)

**ADHESIVES** – solid adhesives like tapes and solid glues

**RUBBERS** – irregular-shaped rubber items that are not thermoplastic or soluble; Examples: o-rings, gaskets, and fittings

**THIN FIBERS** – thin and bundled fibers

**THICK FIBERS** – thick and bundled fibers

**SURFACE ANALYSIS** – for qualitative analysis of the outermost layer of any solid or film

**FREE-FLOWING AQUEOUS SOLUTIONS** – liquids that contain any amount of water; Examples: inks, dyes, solvents, and paints

**OTHER FREE-FLOWING LIQUIDS** – liquids that do not contain water

**VISCOUS LIQUIDS** – thick liquids, pastes, and emulsions; Examples: polyols, greases, and heavy oils

**GASES (PPB TO 100% CONCENTRATION)** – any sample that is a gas at room temperature or slightly above room temperature