

PARTICLE FORMATION - MODIFICATION MODEL

PARTICLE FORMATION							RESULTANT PARTICLES				
MAGMA	COMPOSITION	VENT CONFIGURATION (Smooth - Irregular)	AERODYNAMIC AFFECT (Elongate, Streamline, Twist, Spin)	FLIGHT TIME AT > 800° C. (Long - Short)	SURFACE TENSION (Rounding, Separate into droplets)	GAS EXPANSION VS SURFACE TENSION (Greater than (G.T.) - Less than (L.T.))					
Magma	Homogeneous Melt	Smooth - Homogeneous Jets, Streamers, Filaments.	Homogeneous Jets, Streamers, Filaments.	Long - Homogeneous Jets, Streamers, Filaments.	Homogeneous Spheres, filament rounded particles.	LT(<)	Spheres & Filaments w/some small vesicles	1 - Sphere-Filament, glass w/some vesc. + various constructive or destructive feat. & pumice deposit modification.			
				Short - Frozen homogeneous Streamers, Filaments.	Frozen homogeneous Streamers, Filaments - NO EFFECT	GT(>)	Spheres & Filaments w/surface vesiculation, diasp. cntr.	2 - Sphere-Filament, glass w/coalesc. vesc. cntr. & surf. vesc. + various constructive or destructive features & pumice deposit modification.			
				Irreg. - Homogeneous irregular clots, twisted streamers, particles, rotating blobs.	Homogeneous irregular particles - twisted streamers, clots, rotating blobs, dumbbells	Long - Homogeneous irregular clots, streamers, blobs, particles	Homogeneous irregular part. w/ rounded edges, dumbbells, irregular streamers.	LT(<)	Irregular Streamers, particles w/some small vesc., round edges.	4 - Irreg. Streamer-Particle, glass w/some vesc. + various constructive or destructive features and pumice deposit modification.	
		Melt and Vesicles	Smooth - Inhomogeneous jets of liquid & vesicles	Inhomogeneous liquid & vesic. streamers, filaments, and particles.	Long - Inhomogeneous vesicular particles.	Spheres with many vesicles	LT(<)	Spheres w/large vesicles, no disruption.	7 - Sphere, glass w/many large non-coalesc. vesc. + various constructive or destructive features & pumice deposit modification.		
					Short - Frozen inhomogeneous vesicular streamers, filaments.	Frozen inhomogeneous vesicular streamers, filaments NO AFFECT	GT(>)	Spheres w/large coalesced vesicles, surf. vesicles.	8 - Sphere, glass w/coalesc. vesc. cntr. & surf. vesc. + various constructive or destructive features & pumice deposit modification.		
					Irreg. - Inhomogeneous irregular liquid & vesicles, particles	Inhomogeneous irregular particles of liquid & vesicles, twisted, rotating, clots.	Long - Inhomogen. irreg. vesicular twisted streamers, ribbons, clots.	Spheres, clots, particles with many vesicles.	LT(<)	Irreg. spheres, clots, with large vesicles, no disrupt.	10 - Irreg. Sphere, glass w/many large non-coalesc. vesc. + various constructive or destructive features & pumice deposit modification.
							Short - Frozen inhomogen. irregular vesicular streamers, ribbons, clots.	Frozen inhomogen. irregular vesicular streamers, clots, ribbons, NO AFFECT.	GT(>)	Irreg. spheres, clots, with large coalesced vesicles, surf. vesicles.	11 - Irreg. Sphere, glass w/coalesc. vesc. cntr. + various constructive or destructive features & pumice deposit modification.
							Long - Inhomogen. irreg. vesicular twisted streamers, ribbons, clots.	Inhomogen. irreg. vesicular streamers, ribbons, clots, NO AFFECT.	GT(>)	Irreg. spheres, clots, with large coalesced vesicles, surf. vesicles.	12 - Irreg. Streamer-Particle, glass w/many vesc. + various constructive or destructive features & pumice deposit modification.
					Melt and Crystals	Smooth - Inhomogen. jets of liquid & Xstls.	Inhomogen. jets, streamers, filaments w/ Xstls & Liq.	Long - Thick-walled mineral cored particles.	Thick-walled mineral cored Sphere.	LT(<)	Vesicular, thick-walled mineral cored Sphere.
			Short - Frozen, thick-walled mineral cored streamers, ribbons, filaments.	Frozen, thick-walled mineral cored streamers, ribbons, filaments, NO AFFECT.				GT(>)	Disrupted, thick-walled mineral cored Sphere.	14 - Sphere, mineral cored, thick glass coating w/disrupt. vesc. + various constructive or destructive features & pumice deposit modification.	
			Long - Crystals w/thin liquid coating.	Thin-walled, mineral-cored, semi-spherical particles.				LT(<)	Semi-sphere, mineral-cored thin-walled, w/some vesc. clus. w/some disrupted vesicles.	16 - Rounded particle, mineral cored, thin glass coating, w/some vesc. & disrupt. surf. vesc. + various constructive or destructive features & pumice deposit modification.	
			Irreg. - Inhomogen. irreg. Xstl. clump with some liquid.	Xstl. grains or clumps w/some liquid streamlined away.		Long - Crystals w/thin liquid coating.	Thin-walled, mineral-cored, semi-spherical particles.	LT(<)	Semi-sphere, mineral-cored thin-walled, w/some vesc. clus. w/some disrupted vesicles.	16 - Rounded particle, mineral cored, thin glass coating, w/some vesc. & disrupt. surf. vesc. + various constructive or destructive features & pumice deposit modification.	
						Short - Frozen, very thin-walled glass coated mineral grains.	Frozen, very thin-walled, glass coated mineral grain.	GT(>)	Frozen, very thin-walled, glass coated mineral grain. NO AFFECT.	17 - Mineral grain, thin glass coating, w/o vesc. + various constructive or destructive features & pumice deposit modification.	
						Long - Inhomogen. irreg. Xstl. clump with some liquid.	Inhomogen. irreg. Xstl. clump with some liquid streamlined away.	GT(>)	Frozen, very thin-walled, glass coated mineral grain. NO AFFECT.	17 - Mineral grain, thin glass coating, w/o vesc. + various constructive or destructive features & pumice deposit modification.	
			Melt, Vesicles, Crystals	Smooth - Inhomogen. jets of Vesicles, Liquid and Xstls.	Inhomogen. jets, streamers, filaments of Vesicles & Xstl	Long - Homogeneous irreg. small particles, clots.	Homogeneous Spheres, w/some irreg. surfaces.	LT(<)	Homogeneous Sphere w/many small vesicles.	18 - Sphere, glass, w/some vesc. + various constructive or destructive features & pumice deposit modification.	
	Short - Frozen, homogeneous irreg. small particles, clots.	Frozen, homogen. streamers, ribbons, filaments. NO AFFECT.				GT(>)	Homogeneous Sphere w/coalesced vesicles, surf/disrupt.	19 - Sphere, glass w/coalesc. vesc. cntr. & w/surf. vesc. + various constructive or destructive features & pumice deposit modification.			
	Long - Inhomogen. particles with Vesicles and Xstls.	Spheres w/Vesicles & Xstls.				LT(<)	Sphere w/ Xstls, large vesicles and no surf. disrupt.	21 - Sphere, glass, w/many large vesc. & xstls + various constructive or destructive features & pumice deposit modification.			
	Short - Frozen, inhomogen. streamers, ribbons, w/Vesicles, Xstls.	Frozen, Streamers, ribbons w/ Vesicles and Xstls. NO AFFECT.				GT(>)	Sphere w/ Xstls, large vesicles and surf. disruption.	22 - Sphere, glass w/many large xstls, coalesc. vesc. cntr. & surf. vesc. + various constructive or destructive features & pumice deposit modification.			
	Long - Mineral grains w/o liquid	Mineral grains w/o liquid NO AFFECT.				GT(>)	Frozen, Streamers, ribbons w/ Vesicles and Xstls. NO AFFECT.	23 - Streamer-Filament, glass, w/many vesc. & xstls. + various constructive or destructive feat. & pumice deposit modification.			
	Irreg. - Homogeneous irreg. Liquid Particles	Homogen. irreg. twisted, rotating streamers, ribbons		Long - Homogeneous Liquid Particles	Homogeneous Spheres.	LT(<)	Sphere w/many small vesicles.	26 - Sphere, glass w/some vesc. + various constructive or destructive features & pumice deposit modification.			
				Short - Frozen, Homogen. irreg. streamers, ribbons, filaments.	Frozen, homogen. Streamers, Ribbons, and Filaments.	GT(>)	Sphere w/disrupt. surf. vesc.	27 - Sphere, glass w/coalesc. vesc. cntr. & surf. vesc. + various constructive or destructive features & pumice deposit modification.			
				Long - Inhomogen. irreg. vesicular particles.	Sphere w/many vesicles.	LT(<)	Sphere w/non-coalesced vesc. center.	29 - Irreg. Sphere, glass w/many large non-coalesc. vesc. + various constructive or destructive features & pumice deposit modification.			
				Short - Frozen, inhomogen. irreg. vesicular streamers, ribbon.	Frozen, irreg. Streamers and Ribbons w/many Vesicles.	GT(>)	Sphere w/coalesced vesicular center and disrupt. surf. vesicles.	30 - Irreg. Sphere, glass w/coalesc. vesc. cntr. + various constructive or destructive features & pumice deposit modification.			
				Long - Inhomogen. irreg. rotating Xstls and Xstl Clumps.	Mineral grains w/ very thin liquid coating.	GT(>)	Frozen, irreg. Streamers and Ribbons w/many Vesicles.	31 - Irreg. Streamer-Particle, glass w/many vesc. + various constructive or destructive features & pumice deposit modification.			
	Lithic Fragment	Lithic Fragment	Smooth - Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	32 - Lithic Fragment			
			Irreg. - Lithic Fragment w/slight abrasional rounding.	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	33 - Lithic Fragment w/slight abrasional rounding.		
			Smooth - Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	Lithic Fragment NO EFFECT	34 - Shards + various constructive or destructive features & pumice deposit modification.		
								35 - Reticulite (Frieble) - Reticulite, few if any constructive and minor destructive features & pumice deposit modification.			

Figure 12