



This image was taken with transmitted off-crossed circular polarized light and darkfield reflected illumination. The sample is a tapelift from an auto body shop. This assemblage indicates tire wear, welding, painting, abrasive grinding of welded and painted surfaces, and natural minerals; all consistent with an auto body shop. In an office impacted by this source the particles would be more dispersed, perhaps smaller, and mixed with other assemblages, such as the office assemblage, road assemblage, natural background assemblage, and others.

1. Clear Coat: Clear coat is an isotropic, colorless film or sphere with a refractive index of about 1.54 up to 1.60 depending on formulation. Clear coat flakes tend to have an irregular texture. Clear coat is a protective coating applied over the base color coat to protect the base coat from ultraviolet light fading and from scratches and chipping. It is typically free of pigment. This coating has a birefringent mineral filler (the bright specks).
2. Paint Flake: Paint flakes are flakes containing pigment and other mineral fillers in a transparent matrix. They may be free of pigment as is the case with the clear coat flake above but generally a pigment is present if it is identified as a paint flake. Sometimes the clear cured vehicle surface of a pigmented paint is evident, though not in this case. Paint flakes can be generated by sanding a painted surface.

3. Emery Abrasive: Emery abrasive is angular in shape, colorless, has relatively high refractive indices, and has a low birefringence. The absence of any weathering or cementing minerals helps differentiate the grain from a naturally occurring mineral grain.
4. Weld Scale: Weld scale is an opaque, black flake with a ribbed appearance. Its reflectivity is about 8%, similar to the graphene (form of graphite) in cenospheres. Weld scale is magnetic like heat-treat scale but heat-treat scale tends to be more smooth.
5. Paint Spheres: Paint spheres are spherical or globular particles containing pigment and other mineral fillers in a transparent, colorless matrix. The matrix is sometimes visible at the edge of the sphere. They are created by painting. Spray painting produces large quantities of paint spheres but brush painting or roller painting also produces them. They are the result of small droplets of paint created by the nebulizer, brush fibers springing away from the surface, or fabric fibers or the foam of a roller snapping away from the wet painted surface. In this case three small paint spheres contacted one another before they had completely cured. This is typical of a very high density of paint spheres airborne at the same time. Spray painting is indicated in this case.
6. Natural Minerals: Natural minerals are those grains that are coated with areas of cementing minerals are sub-angular to rounded, and are a common mineral in the soils of that area. These cementing minerals are evident by the firm attachment of foreign materials to the surface of the mineral grain. These are evident in the mineral grain here as both darker areas on the surface and the brownish color due to the preferential scattering of blue light. Near beaches the natural minerals may be free of cementing minerals due to surface erosion but they may be identified in this case by the fact that the mineral in question has no significant use in this environment as an aid to construction, is not a construction material, or a corrosion or degraded fragment of a construction material.
7. Tire Wear: Tire wear consists of a transparent matrix filled with carbon black and various mineral fillers. It is opaque because it absorbs light very efficiently, whether it is transmitted or reflected illumination. As a result it still appears very dark with reflected light. The edges are poorly defined because they very irregular and the thinnest parts transmit light. The mineral grains added to the elastomer are most evident near the edges and can be seen as bright areas, some very small. Tire wear is often in the shape of a tapered cylinder but may be more equant as is the case with the unlabeled tire wear particle to the right of object #4. The length to width aspect ratio increases as the amount of natural rubber increases in the tire. Truck tires contain more natural rubber than car tires and so will generate longer tapered cylinders. Jitney tires have even more natural rubber and can generate very long tapered cylinders. They are often seen in warehouse samples where jitneys are used to move materials on smooth floors.