**BLACK POWDER JARGON AND DEFINTIONS**

**By Scott Jay and Kurt Medlin**

**Black Powder** – A mixture of potassium nitrate, charcoal and sulfur, typically in proportions around 75:15:10, although percentages may vary depending on the application for which it is manufactured. When listed in a fireworks formula or application, it is usually interpreted as a highly processed, fast burning product. However, depending on the context in which the term is used, it may refer to a simple hand mixed version exhibiting a range of burning speeds and characteristics. While many would argue that referring to a slower, unprocessed mixture of potassium nitrate charcoal and sulfur as ‘black powder’ is an incorrect use of the term, a careful pyrotechnist should be aware of the various ways in which the term can be used in the fireworks community.

**BP** – An abbreviation for black powder.

**Commercial black powder, commercial BP** – A highly processed black powder manufactured to a commercial specification for a commercial application, i.e., blasting, firearms, a propellant, manufacture of fuses, military applications, etc., in any number of grain sizes.

**Polverone** – An Italian term for a hand mixed and granulated black powder typically in proportions around 75:15:10 plus a binder. Per Fulcanelli in “Traditional Cylinder Shell Construction, Part I” (Pyrotechnica IX, Pyrotechnica Publications, 1984):

 "Polverone (also Rough Powder) - A rough, home-made powder is sometimes used in the manufacture of shells, often called polverone (literally "large powder" or "coarse powder").  This is a sieve-mixed composition of saltpeter, charcoal, sulfur, and dextrin to bind it, made without milling or grinding, dampened and granulated by rubbing through a coarse screen (typically 3- or 4-mesh).  After drying, the powder is re-screened to break up the lumps and divided into a coarser powder that will not pass the granulating screen and a finer powder that does.

The coarser powder is used for filling the tops of shell casings until level after the stars and powder cores have been put in them.  The finer powder is used for filling the interstices between the stars in multiple break shells, where a solid fill is indispensable to the shell's structural integrity."

**‘Scratch mix,’ ‘hand-mixed black powder,’ ‘Home Powder’** – Colloquial terms used to describe an unprocessed version of black powder, usually **a simple hand sieved mixture** of potassium nitrate, charcoal and sulfur, typically in proportions around 75:15:10 which burns much slower than commercial black powder. Note that these are unprocessed mixtures made without a binder, without milling, and are not pressed, corned or water-granulated.

**Meal Powder** – Meal powder is the fine dust left over when black powder (gunpowder) is corned and screened to separate it into different grain sizes. It is used in a wide variety of fireworks applications and compositions. When specified in a formula or application it is usually assumed to be a highly processed, fast burning product.

Meal powder is used as a propellant by itself or with other chemicals to modify the burn rate and add sparks in propulsive fireworks like rockets, drivers, tourbillions, etc. It is used for making black match and rammed time fuses (spolettes, ‘roman fuse”, etc.).

Meal powder also finds extensive use as a prime, either as a powder or in the form of a slurry for use on stars, comets, and any pyrotechnic surface that needs to catch fire easily from a fuse, flame, burst charge, etc.

Meal powder forms the basis of many spark effect formulae used in ground and aerial fireworks, from soft charcoal spark effects to bright metallic fueled glitter and flitter compositions. It is also added in relatively low percentages to these same types of composition when they are made with hand-mixed meal to increase their burn rate or ignitability.

**“Mill Meal” or “Mill Powder”** are a terms sometimes encountered meaning a mixture of potassium nitrate, charcoal and sulfur usually in 75:15:10 proportions which has been ball-milled to mix it intimately. It is used in the same way as commercial meal powder or can be pressed and corned to produce a granulated black powder.

**Meal D** - Meal D is a designation for a grade of meal powder manufactured by the GOEX company. This designation refers to a meal powder with a particle range of 40-mesh to dust (97% passes 40 mesh). Other GOEX grades of meal powder include Meal F (-100 mesh) and Meal XF (-140 mesh). Meal D is used in fireworks in all the applications mentioned above under *Meal Powder*.

Meal D’s principal advantage over other forms of meal powder made by the pyrotechnist himself, is its consistency and known performance characteristics (density, burn rate, etc.). Meal D is often specified by name in applications where one is looking for a high degree of consistency and reproducibility, such as in the making of spolettes.

**‘Black powder based’, ‘BP-based** ‘(i.e., “BP based stars,” “BP rockets,” “BP based prime,” etc.) – A pyrotechnic composition whose primary component is black powder, either a fast burning commercial quality black powder or a simple hand-mixed version. May also refer to a pyrotechnic composition whose primary components are potassium nitrate, charcoal and sulfur.

**Black Powder Rocket, BP rocket** – A rocket whose propellant is based on black powder, or on a mixture of black powder ingredients of potassium nitrate, charcoal and sulfur in various ratios, or some combination of both. The types of mixtures used in these rockets ranges from 100% fast burning commercial black powder to relatively slow burning hand mixed meal with excess charcoal depending on the rockets, size, nozzle and spindle configuration, and the desired performance.

**2FA or FFA** – Is a designation used by the GOEX Company for a specific grade of blasting powder. The FF or 2F refers to the granulation (4-12 mesh in this case) and the “A” indicates it is a potassium nitrate based powder (as opposed to the “B” blasting powders made with sodium nitrate). The 2FA granulation is what is traditionally used for burst and lift in the Italo-American style of cylindrical shell building. See below for a more complete list the granulations in this system.

**Some commentary on the above…**

Other terms you might see to designate the black powder component of a BP-based formula include, ‘BP,’ ‘Meal,’ ‘Meal D,’ ‘BP Dust,’ ‘BP Meal,’ and other variations such variations. What does this all mean to a beginning fireworker?

I would most likely interpret them to mean a fast burning BP powder, such as commercial meal D or an equivalent homemade powder, as opposed to a hand-mixed, unprocessed mixture of potassium nitrate, charcoal and sulfur in 75:15:10 proportions.

For instance, when interpreting the gold glitter formula below:

Meal Powder 68%

Antimony Sulfide 10

Aluminum (atomized) 14

Sodium Oxalate 8

Dextrin +4

I would assume the person giving me the formula meant a fast burning black powder and would either use commercial GOEX Meal D, or my own fast burning meal (ball milled and made with a ‘hot’ charcoal).

**For reference**, here is a list of GOEX’s “A” blasting grades of black powder:

**GOEX (U.S.) Blasting Grade Black Powder**

FA -3 mesh / +5 mesh

2FA -4 mesh / +12 mesh

3FA -10 mesh / +16 mesh

4FA -12 mesh / +20 mesh

5FA -20 mesh / +50 mesh

6FA -30 mesh / +50 mesh

7FA -40 mesh / +100 mesh

Meal D -40 mesh to dust

Meal F -100 mesh to dust

Meal XF -140 mesh to dust

The ‘-’ designation refers to the smallest size screen the powder will all pass though, and the ‘+’ designation is the largest size screen on which all the powder will be retained.

As a quick reference, here is a summary of the more common terms one is likely to find in a firework formula or specified in a device:

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| **Black Powder Definitions Summary/Quick Reference**  |
| **Black powder, BP** | Assumed to be a processed, fast burning product. It is important to note the grain type specified (FFA, fffg, Meal, etc.). |
| **Polverone** | An Italian term for a hand mixed and granulated black powder typically in proportions around 75:15:10 plus a binder. Not as fast as commercial/highly processed black powder, but typically faster than hand-mixed meal/scratch mix. |
| **‘Scratch mix,’ ‘Hand-mixed black powder’** | An unprocessed version of black powder, usually a simple hand sieved mixture of potassium nitrate, charcoal and sulfur, typically in proportions around 75:15:10 which burns much slower than commercial black powder.  |
| **Meal powder** | The fine dust left over when black powder (gunpowder) is corned and screened to separate it into different grain sizes. Usually assumed to be a fast burning, processed powder. |
| **Meal D, FFA, 4fg** | Specific grade/granulations of black powder made by GOEX. These are all fast burning commercial powders. |