

**The good gunpowder** is known by laying a little on a clean board and setting it on fire. If it burns all the way, and leaves no sign, it is sure to be in its perfection; and on the contrary, if it leaves any sign of earth, it shows that the materials are not well refined, as well as, if the place where it burned becomes dark, it's a sign of having too much coal. It is also known to be gunpowder in its last perfection, when it burns it rises violently, and gives a light blue smoke, which rises united designing a wheel in the air. The next step was quality checking, or "gunpowder goodness," a very interesting quality control process. Alpoim would make the test "by sight, by touch, and by fire." If the shape chosen is the view, or appearance, the color is important. If it is bluish, gunpowder is considered good. To check the humidity and amount of charcoal, rub a white paper on the powder and then expose it to the sun. If it is bright, it is because the saltpeter has not been well mixed, as its crystals are clearly visible, and gunpowder is now considered of poor quality. Choosing the touch, or texture, to check the quality of the gunpowder, one should squeeze it between the fingers; if it splits easily it is because it has too much coal. When doing the test by squeezing the gunpowder against a board or between your fingers and harder grains are found, "and somehow pick the fingers is a sign that the sulfur is not well ground" and the mass is not well mixed with the saltpeter. Gunpowder is then considered bad. In the method of verification by fire, or by heating, Alpoim explains that the quality of the gunpowder is so better as the less residue it leaves after combustion: "(...) putting it on a white paper, if it takes it all together and suddenly raising smoke like a crown, leaving no blackness or sparks burning the paper, is good gunpowder: when the gunpowder is good and very dry, the

can be done in the hand palm without burning it. Bad gunpowder does all in the opposite: medium gunpowder burns less paper; and the one that darkens it, and does not burn, is better than those that burn it. ”

### **To know if gunpowder has dosages not proportional to those considered ideal,**

that is, more or less saltpeter, sulfur or charcoal, Alpoim says that a thimble of powder should be placed on a smooth stone and we will set fire to it; if the gunpowder has too much saltpeter, it will leave small bladders or blisters on the stone; if it has too much sulfur, it will burn out little by little, after the other simple ones are already burned (or it may be, that the sulfur would be grossly stomped) if it has too much coal, it will stay raw on the stone, and full of stickiness. ”

### **How to turn a bad gunpowder into a good gunpowder...**

According to Alpoim there are several ways to turn a bad gunpowder into a good quality gunpowder. The simplest process is to first separate the components, check which one is in the wrong proportion and redo the dosage to obtain a satisfactory composition. From there, the grinding and granulating procedure is repeated. The second process involves boiling a mixture of **aguardente** (brandy) and saltpeter flower, or refined saltpeter. This mixture is then heated and used to spray the undesirable gunpowder, to then further granulate it and dry it. However, he says, “It is necessary to warn that if this gunpowder has yet to be kept for a long time, it is better to buy new gunpowder; because the other one will all turn again bad”