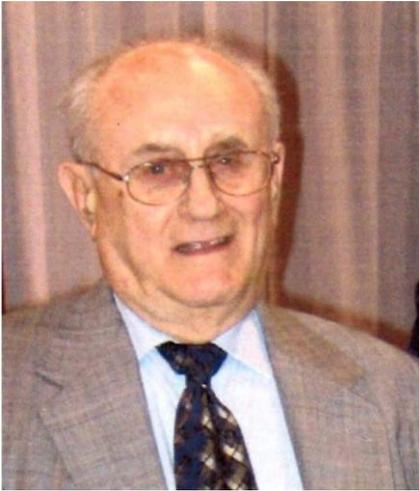


2014 Ammunition Hall of Fame Inductee

RALPH CAMPOLI



Mr. Ralph F. Campoli is a world-renowned design expert in the field of ordnance ammunition. His innovative engineering contributions over a 60 plus year career enabled the U.S. Army to stand tall as the gold standard benchmark for lethality of tank-fired ammunition. His novel design concepts in kinetic energy and chemical energy projectiles have revolutionized tank firepower, providing our fighting forces with unmatched accurate firepower capability against the enemy. His remarkable technical insight and creativity have driven significant step changes in conceptual design of tank projectiles. His life's work and extensive product portfolio have powered knowledge advancement across military and industry armament circles around the world.

Mr. Campoli's commitment to providing our country's forces with only the best weapons systems was evident during his 38 years of civil service at Picatinny Arsenal. This dedication continued through consulting activity in the defense industry for subsequent decades. Over the span of these two lengthy careers, he helped teach a new generation of engineers through personal mentoring and team leadership. His legendary stature in ordnance is all the more remarkable given the lack of a completed engineering degree. World War II interrupted his university studies at Rutgers. Upon discharge, he was urged to return to Picatinny where he devoted his full energy and inventive skill to strengthening America's defense through ordnance development.

Mr. Campoli's early years at Picatinny coincided with emergence of the Cold War period with the Soviets posing a growing threat to a recovering Western Europe. During the 1950s and early 1960s, the USSR military establishment made rapid advancements in tank armor, threatening potential domination of ground warfare if conflict were to break out. This threat drove U.S. and Allied military planners to intensify research and development into more powerful tank weaponry and related munitions. Picatinny played a central role in this effort, with Mr. Campoli a central figure.

The U.S. Army made a strategic decision that all future tank ammunition would consist of two major types of rounds: a kinetic energy round to defeat advanced armor targets and a multi-purpose chemical energy round to target bunkers, structures, personnel and vehicles. Design requirements for these next generation rounds presented an engineering challenge of the first magnitude. Performance focus was to be on extended range, lethality, and accuracy.

Engineers reached early consensus that success in piercing and long-rod fin-stabilized kinetic energy (KE) projectiles would best defeat armor targets. At that time, the US Army's largest tank weapons inventory consisted of 105mm. The need for a new 105mm KE projectile drove an accelerated development program. Early test firings resulted in extremely poor accuracy at elevated temperatures. Mr. Campoli was asked to help resolve this problem. Within

literally a few days, he recommended several alternative methods of sabot redesign that would permit a solution without jeopardizing hardware designs and schedule. One design was quickly fabricated, tested, and well surpassed expected performance at high temperature and extended range. The resulting XM833 program represented hundreds of millions of dollars of ammunition production. This round offered the largest portion of the Army's then existing tank fleet an anti-armor capability unmatched by enemy forces.

In the late 1970s, the U.S. Army completed a tri-lateral design competition with the United Kingdom and Germany, resulting in a decision to design a 120mm weapon system for a new generation of tanks. A kinetic energy penetrator concept would be incorporated into the design. After numerous frustrating attempts, test projectiles experienced a variety of accuracy and structural failures. Mr. Campoli was again requested to serve as a design consultant. He observed test firings, examined recovered parts, and recommended a crucial change in seal design that immediately resolved problems. In subsequent test firings, he went on to develop an obturator and seal system that has proven to be the most efficient projectile seal of any kinetic energy projectile, virtually eliminating metal parts failures. He was also instrumental in designing a sabot system that supports an extremely long penetrator, allowing it to separate evenly at the muzzle for accurate delivery to a target.

To this day, the lethality effectiveness of kinetic energy ammunition is legendary. During Operation Desert Storm in the 1990s, the M829A1 120mm round was nicknamed by Soldiers as the "Silver Bullet." The round's capability to defeat enemy tanks at extended engagement ranges bolstered confidence of our troops that if a hit were made there was assurance of a resultant catastrophic kill.

Mr. Campoli's early design contributions have clearly stood the test of time. In armaments circles he is often referred to as the "Godfather of Modern Tank KE Ammunition," intimately involved in development of such rounds as the M735, M774, M797, M832, M833, M900, M829, M829A1, M829A2, and the M830A1.

He also exercised international influence with our strategic partners. One example was providing assistance to the Republic of Korea to become self-sufficient in developing kinetic energy ammunition for their then existing 90mm tank weapons inventory. His technical guidance and ability to work cross-culturally helped Korean military planners avoid up-gunning their tank fleet to 105mm, saving millions of dollars and ensuring the maintenance of strong force containment on the peninsula.

During the 1960s and 1970s requirements to design a next generation chemical energy round to defeat a wide variety of targets such as structures, bunkers, personnel and vehicles proved a difficult technological challenge. Development of a 105mm projectile rested on substantially reducing drag to increase hit probability. Low drag shapes could provide desired performance but they were highly dependent on engineers' ability to design a fin assembly that would remain tightly closed in the gun but would pop out upon exit. Because of numerous test failures, the Army had considered terminating continued development. Mr. Campoli took the initiative and conceived a fin design and opening mechanism that proved extremely reliable,

lightweight and inexpensive. His persistent and intellectually clever approach enabled a design solution to be ready in time for scheduled formal reviews. Funding was assured.

He was also singularly responsible for design of a slip obturator that allowed a fin-stabilized projectile to be fired through a rifled tube. This concept was instrumental in maximizing the performance of a shaped charge liner. And, at a point in time whenever more advanced armor developments were being introduced by enemy forces, threatening to render then current anti-tank munitions essentially useless, Mr. Campoli invented the Full Frontal Area Fuzing System. This discovery supported his receipt of an Army Research and Development Achievement Award in 1979. His design restored the effectiveness of the Army's only anti-tank capability at that time, a truly strategic contribution.

Mr. Campoli's hallmark design approaches are clearly reflected in the latest state of the art ammunition now being developed. In latest efforts, he assisted the Armament Research and Development Engineering Center engineers in developing sabot projectile concepts for electro-magnetic guns. Over the course of a remarkable career, this vibrant individual has been instrumental in helping to enable America's military dominance in ground warfare systems. Through his guidance and mentoring of hundreds of engineers and countless project teams, he leaves a legacy unmatched in the ammunition profession.