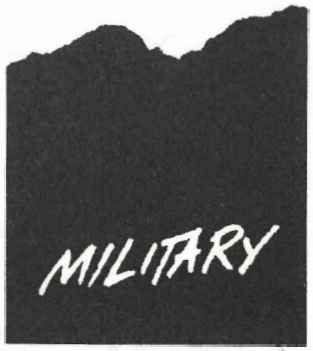

Modern Metals for the war industry

By the Raw Materials Group

The $ 245 billion military budget recently proposed by President Reagan is good news to the leading metals producers in an otherwise depressed market. Three examples from Modern Metals, published by the metals industry, show how the aluminium monopolies expand and profit from the arms race.

Adress: Modern Metals, 919 N. Michigan Ave., Chicago, Ill. 60611, USA.

"WHAT the Goodyear blimp is to rubber, the space shuttle is to aluminum – a billboard in the sky.

The word »ALUMINUM» may not haw been emblazoned on the shuttle's side, but spokesmen for the National Aeronautics and Space Administration (NASA) give much of the credit for Columbia's successful flight on April 12 to the combined expertise of U.S. aluminum producers, metalworking firms and their equipment suppliers.

The orbiter alone–the vehicle exclusive of its main external fuel tank and a pair of booster rockets – contains 190,000 lbs of aluminum, reported Leroy Day, director of systems engineering and integration for NASA's Office of Space Transportation Systems.

The next greatest amount, by weight, of material used in the orbiter is 29,000 lbs of silica fiber for thermal protection tiles, followed by 7000 lbs of copper wire, 3300 lbs of titanium and 3200 lbs of graphite epoxy material.

In addition, the external fuel tank contains about 77,000 lbs of aluminum barrel plate, sheet, extrusions and roll formed components, and the twin boster rockets consume over 350,000 lbs of alumium powder during blast-off as part of their solid fuel mix.»

(...)

Most of the tank's dry weight (76,683 lbs) is heat-treated, high-strength aluminum alloy 2219-T87 plate supplied by **Alcoa, Kaiser and Reynolds.** It does *not* represent a new development, stressed an Alcoa spokesman.

»That plate was developed nearly 10 years ago, during the Saturn project,» he explained. »But it is still about the best thing for this fuel tank application, because of its high strength and weldability.

(...)

Most of the orbiter's 3200 lbs of graphite epoxy material is contained in the cargo bay's huge double doors, reported NASA's Leroy Day. Each of the doors measure 60 ft long x 10 ft wide.

»We chose graphite epoxy for that application because of its low coefficient of thermal expansion,» said Day. »We didn't want the doors to warp in orbit due to asymmetrical heating.»

The booster rockets' 2 million lbs of solid fuel includes over 350,000 lbs of aluminum powder by Alcoa and **Alcan** – the largest concentration of aluminum aboard the shuttle.

»Future shuttle fights through 1984 will consume about 8 million lbs of the powder», said a spokesman for Alcoa, which produces the material at its new plant in Rockdale, TX."

Modern Metals, June 1981

"An aluminum-armored tank weighing less than 20 tons is an example of the lightweight, easily transportable equipment that a rapid-deployment military force would need for quick delivery to trouble spots anywhere in the world, suggests **Reynolds Metals Co.**

The tank, dubbed HSTV-L (High Survivability Test Vehicle-Light-weight), was developed by AAI Corp., a subsidiary of United Industrial Corp., Baltimore, MD 21204. Its three-man crew is protected by a shell of aluminum alloy 7039 armor plate, produced at Reynolds' Mc-Cook, IL, sheet and plate mill.

According to Denny Jones, Reynolds' military vehicle market director, it is estimated that the tank would be at least 25% heavier if it were built with steel armor. This and other weight-saving measures (e.g., a low silhouette) make it possible to transport six HSTV-L's in a C-5A cargo plane, which normally can carry only one or two conventional tanks clad in steel. A C-141 could transport two HSTV-L's."

Modern Metals, April 1981

"A new rocket system deployed by the U.S. Army launches unguided missiles at targets up to 20 miles away

Aluminium for the war industry.
The space shuttle. Top.
The HSTV-L tank. Middle.
The Multiple Launch Rocket System.
Bottom.

with an accuracy within three football fields. Much of the credit for this impressive precision goes to four aluminum bulkheads which support and align the rocket launch tubes.

Measuring approximately 40 in. wide and 27 in. tall, the 70-lb bulkheads won a merit award, nonferrous permanent mold category. **Alcoa** Permanent Mold Castings Division, Cleveland, OH, manufactures the castings for Vought Corp., Camden, AR.

The new Multiple Launch Rocket System utilizes a »six-pack» design containing six rockets. Four bulkheads, each with six circular openings that resemble the plastic rings used to carry a six-pack of beverage cans, support and align six fiberglass wound rocket launch tubes.

This »six-pack» is loaded with live warheads at the Vought armament plant and hermetically sealed. Until firing, the system remains maintenance-free.

The system is about 14 ft long and weighs almost 5000 lbs when loaded. The four aluminum bulkheads in each pack provide a structural shipping framework for the weapons and act as a highly stressed firing package for the rocket tubes when shock mounted on a vehicle for mobility in the field. Two »six-packs» may be utilized at the same time in this rapid fire system.

»It was difficult to produce this part because of its length and width,» reported John Ledbetter, sales manager for the Alcoa division. (...)

The rough casting weighs a little over 100 lbs as-cast. The finished part, ready for a assembly, weighs 70 lbs. »We make between 5,000 and 10,000 of these a year for an ongoing contract», he added.

Aluminum alloy 356.0-T61 was selected to provide the one-piece castings with light weight and strength, according to Ledbetter. Once the rockets have been launched, the bulkheads are discarded.

Modern Metals , September 1981