New Materials and Components

Forest K. Harris: Associate Editor
in Charge of this Section
National Bureau of Standards, Washington, D. C.

In order to supplement manufacturers' information this Department will welcome the submission by our readers of brief communications reporting measurements on the physical properties of materials which supersede earlier data or suggest new research application.

Plasma Torch The "Plasma Torch" uses the energy of a high frequency electromagnetic field to dissociate and ionize gas molecules. Their recombination liberates the absorbed energy in the form of heat. Temperatures in excess of 3000°C have been achieved, and experiments are now under way to reach 5700°C (the surface temperature of the sun). The field is created by a coil or a coaxial cable. In the coil unit a standard triode (Amperex 5866), operating at 27 Mc with an output of 250 w, is used to generate the field. With the coaxial cable a magnetron (Amperex 7292) is operated at 2450 Mc with a 1-kw output. Nitrogen has been used in these experiments, and is converted into a plasma as it flows through the coil or cable. Recombination occurs when the plasma leaves the field, just the point where it escapes from the nozzle of the torch into the open air. A unique feature of the torch is that none of its parts are heated. If the system is turned off the nozzle is found to be cold. Thus the only component requiring eventual replacement is the electron tube or magnetron. Heat is generated without oxidation, a characteristic of importance in some applications. Further information is available from the manufacturer.—*Amperex Electronic Corporation, 230 Duffy Avenue, Hicksville, New York.*

High Pressure Xenon Arc Lamps A new high brightness lamp, developed with the cooperation of the Army Engineer Research and Development Laboratories, contains three arc discharges spaced at approximately a quarter inch and independently switched and regulated. The enclosure is of fused quartz and the filling of xenon at a pressure of more than 10 atm. Features are clean, maintenance-free operation, daylight color, and life up to 1000 hr.—*Duro-Test Corporation, North Bergen, New Jersey.*

Photoconductive Cadmium Cells CRP-60 is a microminiature version of a new cadmium sulfide photoconductive cell, mounted in a sealed all-glass transistor envelope 0.59 in. in length and 0.25 in. in diameter. It is top sensitive and has a 75-mw power dissipation rating. (CRP-61 is the side sensitive version.) It is stated to have a sensitivity 10^4 times greater than conventional phototubes. It may be used in light-operated flip-flop circuits, and as a noiseless resistor in computers; and as a light-sensitive relay in lighting control or stabilization. Other uses include perforated tape readers, alarm and safety devices, automatic counting, filling and loading control.—*Amperex Electronic Corporation, Semiconductor and Special Purpose Tube Division, 230 Duffy Avenue, Hicksville, New York.*

Infrared Transmitting Material Kodak Irtran-2 transmits infrared radiation to 15 μ, with a transmission above 70% between 2.5 and 10 μ in a 2 mm thickness. There is virtually no scattering or absorption loss in the 3–9 μ region, all loss coming from Fresnel reflection. An antireflection coating may, of course, be applied to enhance transmittance. The relatively high refractive index (2.25 average) makes the material useful for refractive optics. The material has been subjected to severe environmental tests and will withstand extremes in both physical and chemical environment. It is available in various forms and sizes and may be worked into practically any conventional optical form. Its hardness is 354 Knoop; its modulus of rupture 14 100 psi; its compressive strength 121 000 psi; its refractive index ranges from 2.29 at 1 μ to 2.15 at 13 μ; its useful temperature range is from −200° to 800°C. Further information is available from the manufacturer.—*Special Products, Sales & Optical Division, Eastman Kodak Company, Rochester 4, New York.*

Photographic Lens with Hemispheric Field The Traid 735 wide-angle lens, for 35-mm cameras, has a 180° field of view with high resolution. In addition to sky studies and drone-scoring systems, this lens will be useful where the camera must be extremely close to the object being photographed. Focal length is 6.51 mm; speed is $f/6.3$; and distortion is "very limited." Complete specifications are available from the maker.—*Traid Corporation, P. O. Box 648, Encino, California.*