

MedRad, Inc.

Switch to thermoplastic alloy increases image clarity of MRI instruments

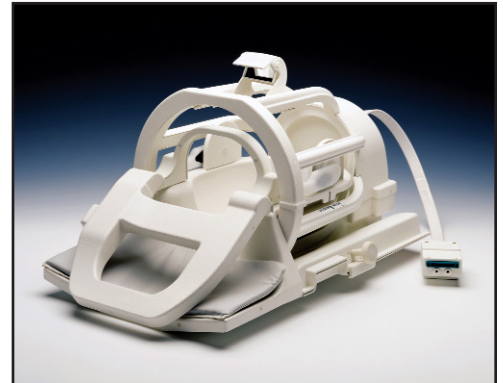
MedRad, Inc., Pittsburgh, PA, a subsidiary of Schering, Inc., manufactures Magnetic Resonance Imaging "fixtures" and receiving coils. Until recently, MedRad thermoformed the housings of its coil assemblies from ABS plastic sheet, but the polymer generated stray emissions in the presence of stronger magnetic fields produced by newer MRI instruments.

MRI devices produce detailed images of internal body structures within a magnetic field by bombarding selected portions of the body with harmless radio signals. The signals cause the protons within hydrogen atoms in the body to move out of alignment. Each time the external radio signals cease, the protons return to their original state – and release energy. The emitted energy is recorded by receiver coils such as those made by Medrad and then fed to a sophisticated computer that converts variations in emitted energy into high-resolution gray-scale images.

ABS can emit signals of its own – the result of excitation of the nuclei of loosely bound hydrogen molecules within the polymer. As MRI makers have increased the intensity of magnetic fields in an effort to produce clearer images more rapidly, "stray" emissions from the plastic housings have also intensified. What was once a tolerable disadvantage has now become a serious one that can compromise medical procedures.

At the urging of one MRI maker it supplies, Medrad investigated KYDEX® 100 thermoplastic alloy for use in thermoforming of its housings. The material's hydrogen atom nuclei proved to be more tightly bound than in polymers previously utilized, producing emissions that are substantially below levels that can affect image accuracy.

The sheet also carries fire retardancy ratings of UL Std. 94 V-0 and 5V, and at 961 J/m (18 ft-lbs./in), it offers twice the impact resistance of flame retardant ABS. Important due to occasional dropping of interchangeable MRI coils by technicians. Other properties of the sheet meeting MedRad's requirements include: tensile elongation of 40 MPa (5,800 psi); modulus of elasticity of 2.392 MPa (347,000 psi); and Rockwell Hardness of 106. The material is cost competitive with flame retardant ABS, and is said to exhibit the broadest chemical resistance of any thermoplastic, allowing repeated cleaning with strong cleansers with no staining or fading.



Phased Array Neurovascular Coil housed in KYDEX® proprietary thermoplastic alloy shell resists abrasion and impact while eliminating signal interference associated with ABS.

KYDEX, LLC

ISO 9001 and 14001 Certified

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