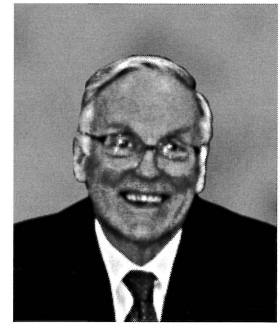


Greeting for BM News No.33



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2004 was a busy year. We moved from the Island of Anglesey in North West Wales to Plymouth in South West England famous for Sir Francis Drake who explored the world in sailing ships and defeated the Spanish Armada on its way to attack England. We now overlook the entrance to the Naval Dockyards and see many ships entering and leaving.

This year we will be celebrating our Golden Wedding – 50 years married. Our family and many old friends and new friends will be with us in Plymouth.

2004 was an interesting year. We visited Xian in China in May, Dresden and Freiberg in Germany in June and Hiroshima and Tokyo in Japan in Nov/Dec. Dresden was badly damaged during World War II and is now being rebuilt. The expansion in China is remarkable. Since our previous visit to Xian 5 years ago, the new buildings and increased road traffic are amazing.

I made many friends in Japan following my

first visit to Hitachi in November 1967. Visits to JABM started in 1999 following a visit to China in 1998 where I met Dr. Harada. Recent visits to Japan with my wife have been particularly memorable. Dr. Harada showed us Kyoto and Nara in 2003 and Mr & Mrs Norio Sugita and Mr. Hidenobu Muta of Toda Kogyo showed us Hiroshima in 2004.

A significant event of 2004 was Port Wheeler's retirement. I first met him at Indiana General in November 1961 when Lucas sent me to the USA to assess the availability of permanent magnets for use in automotive motors. I also visited GE Edmore that subsequently became Hitachi Metals.

In Europe, 2004 has had mixed results. The tragic accident that took the life of Keith Blunden, Managing Director of Magnet Applications was the worst event. However, the magnet industry continues to thrive.

An interesting development in bonded materials is by Hoganas in Sweden, Atomet in Canada and Hitachi Metals in Japan. Soft

Magnetic Composite (SMC) is the ideal partner to bonded magnets. Both have similar strength and manufacturing ability and their magnetic characteristics are complementary. For example, both have low eddy current losses when subjected to ripple flux common in synchronous permanent magnet motors. SMC also has 3 dimensional properties allowing new forms of motor construction.

The increased use of auxiliary motors and actuators in vehicles is increasing demand for all types of permanent magnet. The trend to brushless DC motors, for example, for electric power steering, is increasing the use of NdFeB magnets in their low inertia rotors.

Increased power requirements for radiator fan motors together with the use of variable speed to reduce noise and power demand also makes brushless DC motors the best option. More stepper motors are being used in control systems and many use bonded NdFeB magnet rotors.

Toyota and Honda's production of hybrid electric cars over the past 7 years is now resulting in Ford and GM starting production. Most use permanent magnet motors which will extend the use of NdFeB. European manufacturers are introducing mild hybrids and stop-start systems which use modified alternators with NdFeB magnets between the rotor claws to increase starting torque. Fitment to 10% of European cars is forecast by 2015 which could result in over 1 million starter-alternators each with 1 kg of NdFeB i.e. a total of 1,000 tons per annum.

Growth in the use of permanent magnets in automotive motors is predicted to rise by 20% from 2004 to 2010. Whilst ferrite magnets will grow by 15% (2.4% p.a.), bonded NdFeB magnets are expected to increase by 33% (5% p.a.) and sintered NdFeB by 45% (6.5% p.a.).

Greetings to all my friends at JABM and in the worldwide magnet industry.