MF Batteries, as used on Motorcycles, ATVs & Jet-Skis.

A Short History of Battery Technology & The New “WET” Sealed MF Batteries

- Over the past decade more & more motorcycles have been delivered with sealed so-called “MF” (Maintenance-Free) batteries instead of the previously common filler-cap type. These “MF” batteries were pioneered by Yuasa Battery Japan & first introduced on some Honda motorcycles in the mid-80’s. Their advantages over the filler cap type are mainly their more compact size for a given cranking power & their anti-vibration glass-wool supportive plate separators. These fully absorb and hold the free acid electrolyte by capillary attraction thereby allowing the battery to be mounted even in an inclined position for a lower riding seat height. Sometimes, especially in their early days, these MF batteries also brought some disadvantages, warranty claims resulting from errors in battery commissioning by dealers, in turn compounded by their lack of both technical knowledge about MF battery technology & the appropriate chargers for them.
- Commissioning errors are aggravated by the fact that these batteries are delivered dry-charged with their own individual special acid cellular pack, the acid being of a higher concentration & density than standard battery acid. This acid has to be allowed to trickle from it’s special pack into the battery slowly, to avoid trapping bubbles, then the battery has to stand while the acid is fully absorbed before being given a pre-delivery 30 minute charge. All of this takes a good hour, an irritating delay both for the impatient customer & the dealer trying to satisfy him while also attending to other things. The inevitable tendency is to short-cut the correct procedures & this results in an under-par battery performance & an early warranty claim, usually at the expense of the motorcycle importer or distributor. Field studies by motorcycle manufacturers have shown that around half of all MF battery warranty claims arise from errors in commissioning procedure.
- In the early days, even greater problems arose as a result of a lack of suitable chargers for MF batteries whose battery voltage when fully charged is somewhat higher than that of a fully charged filler cap type. This is because of their more acidic electrolyte & differences in plate design. Moreover, although MF batteries (of the “YTX” type for example) retain their voltage significantly better during storage than filler cap types, once they do fall into deep-discharge (sulphation) they are if anything the more reluctant to accept a charge again. In fact, with their higher voltage characteristics, it happens often that an MF battery just cannot be recharged with a conventional type charger (with constant voltage charge characteristic). This fact gave rise to many MF battery warranty costs until a then obscure Belgian company developed (in the first place for Honda Europe) a completely new type of combination testing & constant current charging device with, moreover, the ability to recover many even sulphated batteries to a serviceable status called the BatteryMate. Today the BatteryMate is the most widely endorsed and used professional diagnostic battery charger in motorcycle workshops in Europe & North America. TecMate followed up the BatteryMate with OptiMate, a specially designed end-user charger to prevent deep-discharge occurring in the first place. The OptiMate PRO 4MF followed, a fully automatic 4-station multiple battery diagnostic charger, whose application aim is to reduce MF battery commissioning errors while also eliminating the pressure on the dealer & the stress which causes the errors.
- Learning from past warranty experience & realising that commissioning errors lay behind many claims, motorcycle manufacturers also deliver pre-filled sealed batteries. The acid is put into these batteries at the battery factory; the battery is sealed, charged and then delivered. The chore of filling the battery is removed from the dealer. Moreover, tests show that these new batteries retain their charge better & for longer than the previous dry-charged MF batteries (those delivered with separate acid packs). Even after 24 months of storage & having lost a good part of their charge, tests done on the new “YTZ” (Yuasa) type “wet” sealed batteries show that the battery can be restored to 90% of it’s original electrical capacity by the BatteryMate, a much better percentage capacity restoration than achievable after a similar period of self-discharge of the dry-charged “YTX” series. However, a correct commissioning charge is still vital for these batteries.
- A number of different models of these new YTZ series batteries have been introduced, from the YTZ7S (6Ah) up to a YTZ14S (12Ah). Besides their slower self-discharge & improved restorability characteristics, the YTZ series batteries are also volumetrically more compact than the YTX series batteries due to a reduced air chamber height (air space above the plates). Battery service life is generally claimed to be equal to that of the YTX series.
- Although these various new batteries have slower self-discharge in storage & improved restorability, the self-discharge clock starts to tick considerably earlier in practice for a battery commissioned & charged at the factory than for a dry-charged battery commissioned & charged by the dealer. It is therefore vital that dealers give these new batteries a pre-delivery charge on a suitable charger before delivery to the end user to avoid potential problems later. The BatteryMate has been tested in Japan & found to be very suitable for the new

YTZ batteries. TecMate expect increased demand for their automatic OptiMate PRO 4-S diagnostic multiple charger arising from the essential pre-delivery recharging of the new batteries.

- "Wet" MF or "AGM" (Absorbent Glass Mat separator) batteries are also referred to in some technical bulletins & documents as " Valve-regulated ". The GT12B-4 batteries fitted to Yamaha's R1, Yuasa's YT7B-4, Fiamm's FGH21803, 18Ah lawn tractor battery & Hawker Energy's "Genesis" G13EP, G16EP & G26EP batteries are all also " WET " MF valve-regulated batteries. However they do NOT all share similar charging voltage characteristics. It is worth mentioning here that there is much confusion around the term "Gel" battery, when applied in the motorcycle industry. Unfortunately, the term "Gel" was mistakenly used to describe AGM batteries in some quarters, presumably because they appeared outwardly similar to the sealed Gel-acid batteries that had been used in deep-cycle applications for decades previously. Worse still, AGM batteries from some obscure Chinese factories seem to have appeared in the marketplace with "Gel" written on the case, despite being of AGM construction. One can only assume that someone asked a Chinese factory for "Gel" batteries while referring to an AGM one, so they obligingly wrote "Gel" on it. As far as we are aware, the only motorcycle battery of a genuine Gel construction is a hybrid starter/DC battery made by Exide for BMW. Other than that specific model, nearly every sealed motorcycle / ATV / Jetski starter battery is likely to be of AGM construction and of course, all these batteries (including Gel) are lead/acid.

- In addition to the BatteryMate & OptiMate Pro-4-S commissioning chargers, all these batteries can be excellently charged with the automatic constant current chargers AccuMate, AccuMate Pro, OptiMate & OptiMate PRO-8-S.