Hello, I’m Your New Technical Support Spokesperson, and This is What I’m Going To Be Doing to Help You!

Mike Darling
TVA Technical Spokesperson
TVA Technical Support Spokesperson Role

- Who am I?
- I began my career in “vermiculite” by joining the Mandoval R&D centre in Godalming UK in the summer of 1983 a year after graduating with an Honours degree in Geology from Portsmouth Polytechnic.
- Worked in various roles for Mandoval Ltd and Mandoval Coatings Ltd developing and testing vermiculite based passive fire protection products and developing the “Mandoval” 1K rotary exfoliator design from the earlier models commercialised by Charles Cole (Chatteris) Ltd.
- Became more integrated in the Mandoval Ltd vermiculite QA and customer support divisions including support for logistics and warehousing.
- With the divestment of the Mandoval Coatings division to Cafco International and the rebranding of the remaining company to Palabora Europe Ltd (PEL) became increasingly involved with the customer support functions for PEL and the CEN European Norm Committees related to vermiculite standardisation as well as with the Trade Associations such as the TVA and BVA/EVA.
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- Fendolite M11 Passive Fire Protection For Use in Refineries and Petro-Chemical Installations Product development from original 80C formulation to final FM11 formulation and testing

Pictures from current Promat Intl. data sheets
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- Mandolite’s P20 & CP2 Product development from original P20 formulation to final CP2 formulation and testing

Pictures from current Promat Intl. data sheets
Mandolite 550

Note use of stainless steel “curly pins” and plastic coated reinforcement mesh. Primer is PSK 100.
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- Exfoliation technology: Production SST 2k Rotary Exfoliator (Martlet’s Services)
Above Stereo binocular and PLM microscopes
Note: MDHS 77 not newer HSG 248 reference document!

Below Amosite Asbestos under PLM and 1st order red compensator plate
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(Pounding the ground in ports and mining operations!)

Bulk vermiculite discharge and transhipment in Antwerp in Belgium
TVA Technical Support Spokesperson Role
(Pounding the ground in ports and mining operations!)

PP&V Vermiculite pit at Phalaborwa

Rotary drier at Vermiculite Operations
TVA Technical Support Spokesperson Role (Meeting the wildlife)
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- TVA President role: Term of Office 2010 - 2012.
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- Answering technical questions posed about vermiculite usage
- Posting inquiries as appropriate on TVA’s social media sites
- Ongoing review of TVA website for functionality
- Update and review TVA brochure's and literature
- Assist with membership recruitment
- Assist with membership relations and helping ensure TVA members needs are met
- To serve on TVA committees as needed
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- To work with TVA staff making recommendations on membership materials
- To attend TVA meetings as required and to provide progress reports and updates
- Contribute regular articles for incorporation into the TVA’s *Lightweight Newsletter*
- Initiate a Patent tracking and research article search process related to vermiculite
- Represent TVA at consumer and industry shows as required.
- Attend CEN and ASTM committee meetings and monitor activity
- Develop quarterly progress reports for the TVA Board
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Examples of recent enquiries:

- A) Animal Feed: Investigating the FDA stance on vermiculite as a “registered” animal feed additive in the US as requested by 2 principle enquirers to the TVA.

  Result thus far from multiple contacts: The US FDA consider that if the vermiculite supplied meets the specifications called out by the original 1960’s submission in 21 CFR 573.100 (verxite) the product is acceptable, and the name (verxite) is not considered propriety.

- B) David Strand: Author of a forthcoming paper on potting soils looking for assistance on writing the ½ page devoted to vermiculite. Needed information on pore size dimensions and data on typical PSD’s of expanded product and generalized trade designations of grades, AFP’s and other general information. The lack of consistency in grade size designations and terminology was particularly challenging!

- C) Enquiry from Baumann Research and Development Corporation (BRD Corp) who are developing a proprietary “incity walk to multi-use building” which must resist natural hazards such as wildfires, earthquakes, hurricanes, floods and GSA lower level blast loading. The Baumann Wildfire Resistant Green Building™ (BauWRGB™) will also be designed to be very energy efficient. BRD Corp. is in search of an economical insulation product that can resist a 1500°F temperature for ten minutes while interior temperatures remain below 400°F.

  Initial approach put them in contact with specialist thermal insulation/fire protection TVA members.
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- Serving on Technical Committee regarding dialogue with the EPA related to wording on the EPA website and the hazards of vermiculite attic insulation.
  - Conference calls
  - Reviewing of data
  - Support
- Membership support
  - The TVA is currently losing membership and the job function includes an active role in consultation with members to help maintain continued membership support.
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- TVA brochure updates
- Currently we have:

  - Vermiculite in the Industrial Sector
    Versatility Personified!!

  - Horticultural Vermiculite
    Does a Professional Job in Any Soil Environment

  - Vermiculite in the Construction Market
    A Multitude of Uses
Vermiculite in the Construction Sector

A Multitude of Uses

Specialist Plasters & Renders

Vermiculite is widely used in the formulation of a variety of plaster and render formulations. As vermiculite is a non-abrasive Aggregate it particularly lends itself to spray application techniques.

- Passive Fire Protection Products

Vermiculite is widely used as a density modifier and insulating component in both spray and hand applied structural steel fire protection products. The exfoliated vermiculite is bonded with hydraulic binders such as Portland cement or hemi-hydrate gypsum, and combined with fillers, reinforcement fibres, and rheological aids to make factory made premixes. These premixes can then be site mixed with water, and applied to the structural members using rotor/stator type pumping and spraying equipment to impart a high degree of fire resistance to be substrate. Exfoliated vermiculite is very efficient thermal insulator in its own right, and it also has the added advantage that it retains moisture, and in the event of a fire this combined water long with water contained by the hydraulic binders, turns to steam, which has a cooling effect on the steel substrate, and thus delaying its temperature rise and preventing its premature structural failure. This allows the safe evacuation of the building, and decreases the subsequent damage to the structure. Vermiculite based passive fire protection products are used both for steel and concrete framed buildings, petrochemical installations, off shore oil and gas platforms, fire resistant dust assemblies and road tunnel linings.
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- Brief summary of European CEN Standards activities:
- CEN TC154 SC5 Standard Lightweight Aggregate Standard(s)
  - EN 13055-1 Lightweight aggregates for use in concrete, mortar and grout.
  - EN 13055-2 Lightweight aggregates for use in bituminous mixtures and surface treatments for unbound and bound applications.
  - EN13055-1 is now accepted by the industry (and the perlite industry as well!) and the easier standard to use for general vermiculite exfoliators to use to CE Mark their product.

- CEN TC88/WG15/TG3 Thermal Insulation Standard(s)
  - EN 14317-1 Thermal insulation products for buildings - In-situ thermal insulation formed from exfoliated vermiculite products- part 1 Specification for bonded and loose-fill products before installation.
  - EN 14317-2 Thermal insulation products for buildings In-situ thermal insulation formed from exfoliated vermiculite products- part 2 Specification for the installed products.
  - EN 14317-1 is now accepted by the industry, and some European exfoliators are using it to CE Mark exfoliated vermiculite for thermal insulation purposes.
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Brief summary of European CEN Standards activities (continued):

- **EN 15600-1** Thermal insulation products for building equipment and industrial installations—In-situ thermal insulation formed from exfoliated vermiculite products. Part 1 Specification for bonded and loose-fill products before installation.
- **EN 15600-2** Thermal insulation products for building equipment and industrial installations – Part 2 Specifications for the installed products.

So far there seems no obvious adoption of this standard by the industry but this situation is still being clarified. It is widely seen on as a standard for sale on websites retailing “standards” and is quoted in some specifier’s guides, although its current and future role in CE Marking is in some question.

- **Draft prEN 15501** Thermal insulation products for building equipment and industrial installations – Factory made expanded perlite and exfoliated vermiculite products – Specification.

This has now completed the formal vote and is now published. Copies can be obtained from National Bodies such as BSI/AFNOR/DIN etc., however, there is not yet any obvious adoption of this standard. Again there is some question about its future for CE Marking purposes.
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Examples of Recent Patent Searches:

a) **US Patent 2014/0158273 A1**  **Publication date: June 12 2014.**

   **Lightweight, Reduced Density Fire Rated Gypsum Panels**

   **Applicant:** United States Gypsum, Chicago (IL) USA.

   **Inventors:** Qiang Yu, Srinivas Veeramasuneni, Weixn Song, Wenqi Luan.

   **Abstract:** A reduced weight, reduced density gypsum panel that includes high expansion vermiculite with fire resistance capabilities that are at least comparable to (if not better than) commercial fire rated gypsum panels with a much greater gypsum content weight and density.

b) **US Patent 2014/0141351 A1**  **Published May 22 2014.**

   **SOFC Stack with Temperature Adapted Compression Force Means**

   (Note: SOFC = Solid Oxide Fuel Cells)

   **Assignee:** Honda Motor Company Ltd Tokyo (Japan).

   **Inventors:** Masashi Shinohara, Keiji Tsukamoto, Hideo Urata.

   **Abstract:** A fuel cell stack includes a lower end plate for placing a stack body on the lower end plate, a load plate for applying a load to the stack body in a stacking direction, and a fuel cell support member provided between the load plate and the stack body. The fuel cell support member includes composite layers of composite material of alumina fibre and vermiculite. The fuel cell support member includes a first support section for applying a load to sandwiching sections at a position corresponding to electrolyte electrode assemblies, and a second support section for applying a load to reactant gas supply sections in the stacking direction. The density of the first support section is smaller than the density of the second support section.
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- **ASTM Standards:**
  - **ASTM C516 - 08(2013)**
    - Standard Specification for Vermiculite Loose Fill Thermal Insulation
  - **ASTM C196 - 00 (2010)**
    - Standard Specification for Expanded or Exfoliated Vermiculite Thermal Insulating Cement
  - **ASTM C332 - 09**
    - Standard Specification for Lightweight Aggregates for Insulating Concrete

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ANY QUESTIONS?