

## MALLINCKRODT CHEMICAL WORKS

MANUFACTURERS OF  
FINE CHEMICALS FOR MEDICINAL, PHOTOGRAPHIC  
ANALYTICAL AND INDUSTRIAL PURPOSES

FACTORIES: ST. LOUIS, JERSEY CITY, MONTREAL  
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CABLE ADDRESSES  
MALLINCKRODT, ST. LOUIS  
DESABRIDO, NEW YORK  
CODES  
A. B. C. FIFTH ED. IMP  
A. B. C. SIXTH ED.  
BENTLEY'S COMPLETE PHRASE  
BENTLEY'S SECOND PHRASE

SECOND AND  
MALLINCKRODT BKS ST. LOUIS, 7. MO.

*Mallinckrodt*  
FINE CHEMICALS  
Standard Since 1867

4 February 1958

Mr. Lyall Johnson  
Licensing Division  
U. S. Atomic Energy Commission  
Washington, D.C.

SUBJECT: Special Nuclear Materials License No. SNM-33

Dear Mr. Johnson:

Some of our customers for our  $UO_2$  of up to 5% enrichment have indicated a preference for blended lots in excess of the "limited safe" batch size. In order to provide such material, it is necessary to utilize blending equipment.

We have designed a blending facility which we believe quite adequate from the standpoint of criticality control and dust control and are requesting that our license be modified to include this blending facility as a part thereof.

The product from our low assay production area is produced batch-wise utilizing "limited safe" quantities for the particular assay with a maximum quantity of approximately 350 pounds for the lower assay material. Each 15 gallon drum, as it is filled in the final operation, contains no more than one "limited safe" batch.

The blending will be accomplished in a specially designed dust control hood. A maximum of 10 drums can be combined in a single operation in the following manner:

1. A single drum from a storage rack containing a "limited safe" batch will be placed in the hood. After closing the hood, the lid will be removed and the drum placed on a four wheel dolly in a canted position. The dolly rides on rails along the back of the hood.
2. In front of the rail carrier will be located ten stations, each separated from the next by a concrete slab 1 ft. thick, approximately 3 ft. high and 2 ft. wide to isolate each station from the next from a neutron interaction standpoint. An empty 15 gallon drum will be positioned in each station.
3. The dolly will be moved from station to station and an operator will transfer with a hand scoop, by volume, one-tenth of the product from the full drum into a drum in each of the receiving stations.

*Class Review  
not required  
glt 2/1*

*5/27*

4. This operation will be repeated until the entire batch is blended or until the drums at each station are 65% filled. The individual drums having received the incremental parts of the blend will be fitted with a lid, removed from the hood, placed on a roller and tumbled to accomplish blending. At this point, the drums, if they contain a "limited safe" batch, will be accurately weighed and placed in birdcages and transferred to the storage vault awaiting shipment. In the cases where the 65% filled drum contains less than a "limited safe" batch, these drums will be transferred to a packaging station where the individual drums will be loaded, by weight. The "limited safe" quantity will not be exceeded in any drum. Following loading and weighing, the drum will be placed in a birdcage for transfer to the storage vault awaiting shipment.

The procedure for material movement control inside the blending building will be as follows:

1. Facilities

The blending room is approximately 20 x 50' and the entire area will be devoted to this single operation. The blender hood is on one wall. Steel storage racks will occupy two other walls. These racks are constructed to maintain 2 ft. edge to edge spacing between sides and top and bottom of the drums. One rack provides for two-high storage and one rack for three-high storage. Also in this area will be a dust controlled packaging hood which will be used in those cases where the batch size is greater than can be properly tumbled for adequate blending. Also in the same area will be two roller type blending machines for tumbling drums. These are so located that when two drums are being rotated at the same time, spacing of more than 2 ft. edge to edge is maintained.

2. Material Movement

Drums will be removed from the packaging station in the  $UO_2$  production facility by fork truck and carried, one at a time, into the storage racks in the blender building. Brightly colored lines will be painted on floors as a guide to the fork truck operators so as to prevent the possible close approach of two "limited safe" batches. In the blender building, brightly colored lines will be painted on the floor in front of all storage racks and the blender hood as a guide to the operators to indicate the central floor area in which lateral movement of a drum will be permitted. This central area inside the colored lines will maintain at least a 2 ft. edge to edge space between the drum being moved and those in either the storage rack or the blender hood. All personnel will be carefully instructed as to the necessity of maintaining this spacing and the operating procedure will be rigorously enforced.

The filled drums from the blending hood loaded to approximately 65% by volume or less, depending upon assay, will be moved by hand dolly out of the individual stalls to the central area beyond the colored line and

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moved to the rolling station. From the rolling station the drums will go into birdcages directly if the contents of the drum are a "limited safe" batch and to the packaging station if the drum contains less than a "limited safe" batch for filling to not more than the "limited safe" quantity. A scale is provided for accurate weighing checks.

We request your prompt consideration of this application and further request that if additional information is required we be informed by telephone or telegraph so that we may supply the needed additional information promptly.

Sincerely yours,

MALLINCKRODT CHEMICAL WORKS

*W. M. Leaders*

W. M. Leaders  
Technical Director  
Special Metals Division

WML:dj

*W. M. Leaders*

STATE OF MARYLAND  
MONTGOMERY COUNTY

Signed before me this 6th  
day of February 1958.

*Battaille S. Power*  
Battaille S. Power  
Notary Public

Commission expires May 4, 1959