

NARCO CONFIDENTIAL-RESTRICTED

NARCOGUN PD 345

Made at: Womelsdorf, PA

PRODUCT LIFE: NOV. 11, 1964 TO JAN. 17, 1986 (NARCOGUN PD 345)

JAN. 17, 1986 TO PRESENT (NARCOGUN 345)

ASBESTOS DATES: NOV. 11, 1964 TO JAN. 31, 1977

NARCOGUN PD 345 MIXES: 342

342A

342B

342C

342D

342-03

342-04 (NARCOGUN 345)

342-05 (NARCOGUN 345)

NARCO — WORKMIX
CONFIDENTIAL
FILE COPY

WORKMIX / STCOLL/01 - HPDESK pri

Subject: WOMOM3420-05
Creator: WORKMIX / STCOLL/01

Dated: 02/19/87 at 1428.

NARCO CONFIDENTIAL-RESTRICTED
NORTH AMERICAN REFRACTORIES COMPANY
MIX SHEET

NARCO CONFIDENTIAL-RESTRICTED

BRAND: NARCOGUN 345
PLANT: WOMELSDORF

MIX SHEET NO. 3420-05
DATE: 12/17/86

	RMS NO.	RAW MATERIALS	SIZING	WT.%	TYPICAL
1	082901-16	PERICLASE	-6+14M>		50
2	082901-28	PERICLASE	-14+48M>	98.5**	18
3	082901-42	PERICLASE	-48M >		8
4	082901-52	PERICLASE	BMF*>		22.5
5	041023	ATTAGEL CLAY		1.5	
6					
7		ADDED:			
8	191117	MONOSODIUM PHOSPHATE		5.0	
9					
10		TOTAL:		105.0	
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

IXING INSTRUCTIONS: Dry mix for five (5) minutes.
Jp to 15% Periclase DCF may be substituted for Periclase BMF.
*Adjust Periclase fractions to hit IN-PROCESS CONTROL SPECIFICATIONS target screen.

I-PROCESS CONTROL SPECIFICATIONS:
?.0 +/- 2% cum. on 8 mesh
..0 +/- 2% cum. on 20 mesh
+/- 2% cum. on 48 mesh
.J +/- 2% pass 200 mesh

SCRAP DISPOSITION/REWORKING:
Unclassified basic scrap.
Reworking may be possible.

CLEAN OUT CATEGORY:

NARCO CONFIDENTIAL-RESTRICTED

ND: NARCOGUN 345 MIX SHEET NO. 3420-05

PLANT: WOMELSDORF DATE: 12/17/86

FINISHED PRODUCT SPECIFICATIONS: PAGE: 2 OF 2

PROPERTY	TEST METHOD	SPECIFICATIONS
SCREEN ANALYSIS ON +6M	TCT - 9 - PC	
SCREEN ANALYSIS ON +8M	TCT - 9 - PC	11.0 - 33.0%
SCREEN ANALYSIS ON +14M	TCT - 9 - PC	
SCREEN ANALYSIS ON +20M	TCT - 9 - PC	40.0 - 58.0%
SCREEN ANALYSIS ON +48M	TCT - 9 - PC	51.0 - 64.0%
SCREEN ANALYSIS PASS 200M (CUMULATIVE ANALYSIS)	TCT - 9 - PC	27.0 - 38.0%

PECIAL INSTRUCTIONS:

NDLING, STORAGE, PACKAGING . . .
HELF LIFE IS ONE YEAR IF STORED
A COOL, DRY PLACE.

REASON FOR CHANGE
UPDATED MIX

'S: L.D. DILLEY J.A. KANIUK
T.R. BENDER R.R. RILEY
E.A. STARKEY (BP)

REPLACES MIX DATED: 2/3/86

APPROVALS:

RESEARCH: J.A. KANIUK

PLANT:

NARCO CONFIDENTIAL-RESTRICTED

ge.
ct: WOMOM3030-05, WOMOM3300-04, WOMOM3420-05, WOMOM3920-04, WOMO
eator: WORKMIX / STCOLL/01

Dated: 02/19/87 at 1429.
Contents: 2.

rt 1.

TO: WORKMIX / STCOLL/01

rt 2.

GENERAL APPROVAL WORK ORDERS/MIX SHEETS:

TE: 01/13/87

PLANT MANAGER INITIALS: LDD

MENTS: NONE

DUCT NAME:		PRODUCT CODE:	
	NARMAG WO II		WOMOM3030-05
	NARCHROME CASTABLE		WOMOM3300-04
	NARCOGUN 345		WOMOM3420-05
	NARMAG MORTAR HEAT-SET		WOMOM3920-04
	NARTAR RAM MIX		WOMOM5000-05

NARCO CONFIDENTIAL-RESTRICTED

NARCO CONFIDENTIAL - RESTRICTED

NORTH AMERICAN REFRACTORIES COMPANY
MIX SHEET

BRAND NARCOGUN 345 MIX SHEET NO. 342-04

PLANT Womelsdorf DATE February 3, 1986

	RMS NO.	RAW MATERIALS	SIZING	WT. %	TYPICAL
1	145	Periclase	-6+14M		50
2	145	Periclase	-14+48M	98.5	18
3	145	Periclase	-48M		8
4	145	Periclase	BM*		22.5
5	133	Attagel Clay	---	1.5	
6				100.0	
7		To be added:			
8	147	Monosodium Phosphate	---	5.0	
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					

MIXING INSTRUCTIONS * Up to 15% DCF may be substituted for BM

IN-PROCESS CONTROL SPECIFICATIONS

Cum. on 8 Mesh	19 +/-2%
Cum. on 20 Mesh	51 +/-2%
Cum. on 48 Mesh	62 +/-2%
PASS 200 Mesh	33 +/-2%

SCRAP DISPOSITION/REWORKING
Unclassified Basic scrap
Reworking may be possible

CLEAN OUT CATEGORY: N/A

BRAND NARCOGUN 345 MIX SHEET NO. 342-04

PLANT Womelsdorf DATE February 3, 1986

FINISHED PRODUCT SPECIFICATIONS

PROPERTY	TEST METHOD	SPECIFICATIONS
Screen Analysis on +6M		
Screen Analysis on +8M		19 ± 6%
Screen Analysis on +14M		
Screen Analysis on +20M		51 ± 6%
Screen Analysis on +48M		62 ± 6%
Screen Analysis on PASS 200M		33 ± 6%

SPECIAL INSTRUCTIONS

HANDLING, STORAGE, PACKAGING . . .

Shelf life: 1 year in cool, dry place

REASON FOR CHANGE

Name Change

CC's

Womelsdorf J.A. Kaniuk

T.R. Bender R.R. Riley

E.A. Starkey (BP) K.A. Nelson

REPLACES MIX DATED May 31, 1985

APPROVALS:

RESEARCH: J a Kaniuk

PLANT:

CONFIDENTIAL — RESTRICTED

NORTH AMERICAN REFRACTORIES COMPANY **NARCO CONFIDENTIAL-RESTRICTED**

MIX SHEET

RAND *NARCOGUN PD-345* MIX NO. *342-03*

LANT *Womelsdorf* DATE *May 31, 1985*

MIX BATCH

	RMS No.	Raw Material	Sizing	Wt. %	Typical
1	*145*	*Periclase*	*-6/+14 Mesh*		*50*
2	*145*	*Periclase*	*-14/+48 Mesh*	*98.5*	*18*
3	*145*	*Periclase*	*-48 Mesh*		*8*
4	*145*	*Periclase*	*BM**		*22.5*
5	*133*	*Attagel Clay*	*--*	*1.5*	
6	*147*	*Monosodium Phosphate*	*--*	*5.0*	*(added)*
7					
8					
0					
1					
2					
3					
4					

XING INSTRUCTIONS **Up to 15% DCF may be substituted for BM*

PROCESS CONTROL SPECIFICATIONS

Cum. on 8 mesh	*19±2*
on 20 mesh	*51±2*
on 48 mesh	*62±2*
PASS 200 mesh	*33±2*

SCRAP DISPOSITION/REWORKING

Unclassified Basic scrap

Reworking may be possible

BRAND NARCOGUN PD-345 MIX NO. 342-03

PLANT Womelsdorf DATE May 31, 1985

FINISHED PRODUCT SPECIFICATIONS

PROPERTY	TEST METHOD	SPECIFICATIONS
Screen Analysis on +6 mesh		
Screen Analysis on +14 mesh		
Screen Analysis on +8 mesh		19±2
Screen Analysis on 20 mesh		51±2
Screen Analysis on 48 mesh		62±2
Screen Analysis on PASS 200 mesh		33±2

HANDLING, STORAGE, PACKAGING, ...

Shelf Life: 1 year in cool dry place

SAFETY PRECAUTIONS

Monosodium phosphate may irritate skin and eyes

Potential crystalline silica from clays

(Approved dust respirator)

APPROVED J a Ramil RESEARCH

APPROVED Pelson OPERATING

APPROVED [illegible] PLANT

REPLACES MIX SHEET DATED 10-19-65

REASON FOR CHANGE

Update

FORM 318 B

NORTH AMERICAN REFRACTORIES COMPANY

Mix Instruction

NARCO CONFIDENTIAL-RESTRICTED

Plant Womelsdorf - Basic

Date February 27, 1968

Brand Narcogun P-340

Mix No. 341 A

Process Phosphate - bonded

Burn

(SPS) Periclase Gun Mix

Shrinkage

EXPERIMENTAL MIX

Periclase	-6 +14 mesh	51 %
Periclase	-14+48 mesh	18 %
Periclase	ASF	30 %
7K05 Asbestos		1 %
		100 %

Special Instructions Shred asbestos into mix by hand to break up lumps. SPS solution will be added at the gun nozzle on the job.

Control Specifications

Reason for change: To reduce top grain size for gunning studded tiles tubes.

Signed Robert L. Hess
RESEARCH

Replaces Expt'l Mix No. 341
dated 11/11/64
2-27-68 by

FORM 116 B

NARCO CONFIDENTIAL-RESTRICTED

NORTH AMERICAN REFRACTORIES COMPANY

Mix Instructions

Plant WOMELSDORF, PA.

Date ~~JUNE 15, 1976~~ January 31, 1977

Brand NARCOGUN PD-345

Mix No. 342 ~~C~~ D

Process PHOSPHATE-BONDED DRY MAGNESITE GUN MIX

Burn

Shrinkage

Mix

GRADE E MAGNESITE	-3+6	~~-4+8~~ MESH	— ~~34%~~ *
GRADE E MAGNESITE	-6+14	~~8+20~~ MESH	47% ~~39~~ *
GRADE E MAGNESITE	-14+48	~~20+48~~ MESH	18 ~~19~~ *
GRADE E MAGNESITE		-48 MESH	6 ~~4%~~ *
PERICLASE		ASF	27.5 ~~30~~ *
~~7K05 ASBESTOS~~ Attagel 50 ***			1.5
			100%

Note: Up to 15% periclase dust can be substituted for periclase ASF.

** MONOSODIUM PHOSPHATE (NaH_2PO_4) 5% ADDED

* MAY BE ADJUSTED TO MEET SCREEN ANALYSIS TARGET (SEE CONTROL SPECS.)

Special Instructions

** PURCHASED FROM MONSANTO CO. AS "MONOSODIUM PHOSPHATE REGULAR GROUND CODE 140". *** Attagel 50 distributed by Van Horn Metz & Co. 201 East Elm St, Conshohocken, Pa 19428. ~~SHRED ASBESTOS INTO MIX BY HAND TO BREAK UP LUMPS.~~

Control Specifications

CUM. +8 MESH: 19±2%

CUM. +20 MESH: ~~15±2%~~ 51±2%

CUM. +48 MESH: 62±2%

-200 MESH: 33±2%

Change to eliminate asbestos

Based on Work Orders 965, Mix 2 and 1006.

Approved Robert L. Hess Research

Approved [signature] Operations

Approved [signature] Plant

Replaces Sheet Dated

6/15/76 (342C)

FORM 116 B

NORTH AMERICAN REFRACTORIES COMPANY

Mix Instructions

NARCO CONFIDENTIAL-RESTRICTED

Plant WOMELSDORF, PA.

Date June 15, 1976

Brand NARCOGUN PD-345

Mix No. 342 C

Process PHOSPHATE-BONDED DRY MAGNESITE GUN MIX

Burn

Shrinkage

Mix

GRADE E MAGNESITE	-4 + 8 MESH	24% *
GRADE E MAGNESITE	-8 +20 MESH	30 *
GRADE E MAGNESITE	-20 +48 MESH	10 *
GRADE E MAGNESITE	-48 MESH	5 *
PERICLASE	ASF	30 *
7K05 ASBESTOS		1
		100%

** MONOSODIUM PHOSPHATE (NaH_2PO_4) 5% added

* May be adjusted to meet screen analysis target (See control specs.)

Special Instructions **Purchased from Monsanto Co. as "Monosodium Phosphate Regular Ground Code 140". Shred asbestos into mix by hand to break up lumps.

Control Specifications

Cum. +8 mesh: 19 ± 2%

Cum. +20 mesh: 51 ± 2%

Cum +48 mesh: 62 ± 2%

-200 mesh: 33 ± 2%

Based on Work Order 965, mix 2.

Replaces Sheet Dated

2/27/68 (Exptl Mix No 3428)

Approved Robert L. Hess — Research

Approved — Operating

Approved — Plant

KFW

FORM 318 B

NORTH AMERICAN REFRACTORIES COMPANY

Mix Instructions

NARCO CONFIDENTIAL-RESTRICTED

Plant Womelsdorf - Basic

Date February 27, 1968

Brand Narcogun PD-345

Mix No. 342 B

Process Phosphate - Bonded

Burn

(dry) Periclase Gun Mix

Shrinkage

EXPERIMENTAL MIX

Periclase	-6+14 mesh	51 %
Periclase	-14+48 mesh	18 %
Periclase	ASF	30 %
7K05 Asbestos		1 %
		100 %.

* Monosodium Phosphate (NaH_2PO_4) 5 % added

Special Instructions * Purchased from Monsanto Co. as "monosodium phosphate regular ground code 140". Shred asbestos into mix by hand to break up lumps.

Control Specifications

Reason for change: To reduce top grain size for gunning studded boiler tubes.

Signed Robert L. Hesse
RESEARCH

Replaces Exptl Mix no. 342 A
dated 10/19/65
2-27-68 RH

NARCO CONFIDENTIAL-RESTRICTED

NORTH AMERICAN REFRACTORIES COMPANY

MIX INSTRUCTIONS

PLANT WOMELSDORF-BASIC | DATE OCT 19 1965

BRAND NARCOGUN PD-345 | MIX NO. 342 A

PROCESS PHOSPHATE-BOND (DRY) | BURN

PERICLASE GUN MIX | SHRINKAGE

EXPERIMENTAL MIX

PERICLASE	-4+8	40 %
PERICLASE	-8+20	15
PERICLASE	-20+48	10
PERICLASE	-48	5
PERICLASE	ASF	25
GLEASON CLAY	AF	5
* MONOSODIUM PHOSPHATE		5 (added)
		105 %

SPECIAL INSTRUCTIONS * PURCHASED FROM MONSANTO CO AS MONOSODIUM PHOSPHATE REGULAR GROUND CODE 140.

CONTROL SPECIFICATIONS

CUM +8 31% ± 2½%

-200 27½ ± 2½%

TO BE SHIPPED ONLY ON RESEARCH APPROVAL

SIGNED Robert L. Ness
Research

REPLACES MIX 342 DATED NOV 11, 1964
BASED ON WO 404 DATED SEP 22, 1965

NARCO CONFIDENTIAL-RESTRICTED

NORTH AMERICAN REFRACTORIES COMPANY

MIX INSTRUCTIONS

PLANT Womelsdorf - Basic

DATE November 11, 1964

BRAND NARCOGUN PD-345

MIX NO. 342

PROCESS Phosphate-bonded (dry)

BURN

Periclase Gun Mix

SHRINKAGE

EXPERIMENTAL MIX

Periclase	-4+8 mesh	28%
Periclase	-8+20 mesh	17%
Periclase	-20+48 mesh	15%
Periclase	-48 mesh	5%
Periclase	ASF	31%
7K05 Asbestos		1%
* Monosodium phosphate (NaH_2PO_4)		3%
		100%

SPECIAL INSTRUCTIONS Shred asbestos into mix by hand to break up lumps. *Purchased from Monsanto Chem. Co. as "Monosodium phosphate Regular ground Code 140.".

CONTROL SPECIFICATIONS

SIGNED Robert L. Hess
Research

11-13-64
RH