PRODUCTION PROCESS OF STABILITY-ENHANCED BLASTING AGENT

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Abstract: *in this paper described that we have newly established a production process of a blasting agent containing SMEA (synthetic fatty acid monoethanolamide) as a stabilizer, and described that large blasting is ensured by producing 70 t of blasting agent required for blasting of 300 000MT.*
By improving the stability of the blasting agent, not only the power of explosives was stably preserved, but the surfactant action of SMEA reduced the space rate in the ammonium nitrate, thereby increasing the loading density of the blasting agent by 8 %.
Keywords: *blasting agent, SMEA, explosive manufacturing.*

УКРЕПЛЕНИЕ СТАБИЛЬНОСТИ ВЗРЫВЧАТЫХ ВЕЩЕСТВ

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Аннотация: *в этой статье описывается, что мы недавно установили процесс производства взрывчатого вещества, содержащего SMEA (моноэтаноламид синтетической жирной кислоты), в качестве стабилизатора, и описали, что большая взрывная работа обеспечивается получением 70 т взрывчатого вещества, необходимого для струйной обработки 300 000 МТ.*
Благодаря повышению стабильности взрывчатого вещества не только стабильность взрывчатых веществ стабильно сохраняется, но действие поверхностно-активных веществ SMEA уменьшает объемную скорость в нитрате аммония, тем самым увеличивая плотность загрузки взрывчатого вещества на 8 %.
Ключевые слова: *взрывчатый агент, SMEA, взрывчатое производство.*

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1) Establishment of production process of stabilized blasting agent

The process for adding SMEA to diesel oil is shown in Fig 1.

First, add a certain amount of diesel oil and the required amount of SMEA to the mother liquor preparation tank (at this time, the concentration of SMEA in the diesel oil is 10%), indirectly heat it by hot water and raise the temperature to near 60 ° C. [1, p. 62]

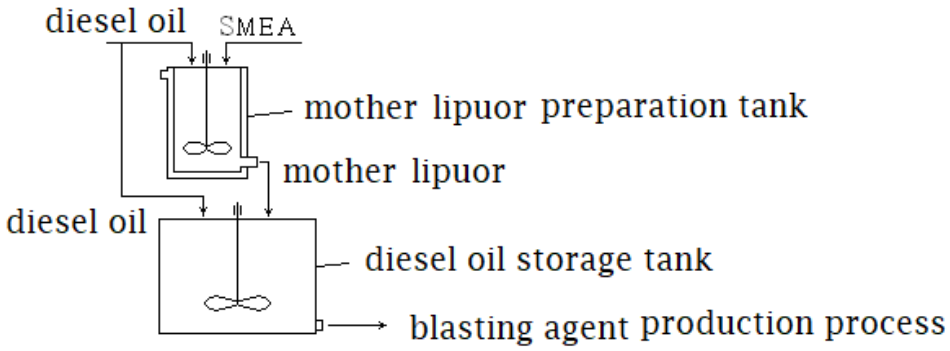

Fig. 1. Process for adding SMEA to blasting agent

Stir with a stirrer while maintaining the temperature for 10 minutes.

It is then sent to a diesel oil storage tank to be diluted in whole diesel.

Next, SMEA-added diesel oil is sent to the blasting agent production process.

2) Technical and Economic Effectiveness

First, the physical stability of the blasting agent was enhanced.

It was lowed the interfacial tension of ammonium nitrate and diesel oil by adding synthetic fatty acid monoethanolamide (SMEA) to diesel oil for blasting agent without porosity and micro disintegration of

ammonium nitrate and by increasing the viscosity of diesel oil, the flow of diesel oil in the blasting agent was delayed by the required amount of time according to the addition amount of SMEA and was improved its consolidation stability.

As a result, it was protected the diesel oil leaking in the production and transportation process of the blasting agent and was protected floating of the diesel oil in the loading space and was improved the effectiveness of large blasting agent. Also by regulating the added amount of SMEA the blasting agent used for the only one-day blasting agent could be maintained and used for a certain period of time.

The production process of the blasting agent with SMEA addition process is shown in Fig. 2.

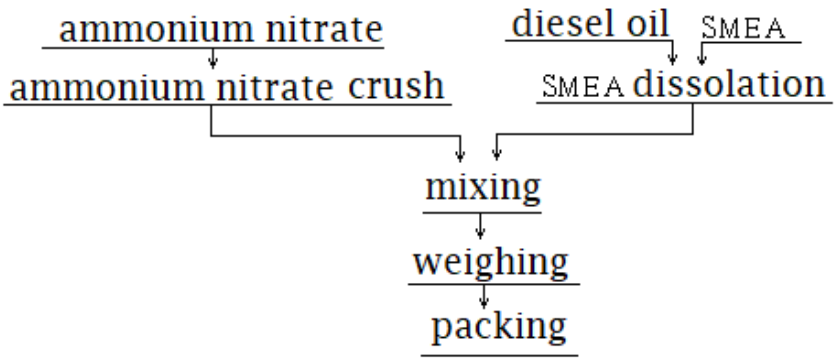

Fig. 2. Blasting agent production process adding SMEA

Second, the blasting density and explosive power of the blasting agent were increased.

By improving the stability of the blasting agent, not only the power of explosives was stably preserved, but the surfactant action of SMEA reduced the space rate in the ammonium nitrate, thereby increasing the loading density of the blasting agent by 8%.

As the density of charge increases, explosive work capacity increased by 10% on average, explosion rate by 9%, explosion pressure by 19% and specific power by 18.5% on average.

Table 1. Technical economic indicators of stabilized blasting agents

Indicators		**unit**	**Previous blasting agent**	**Stabilized blasting agent**
Composition	Ammonium nitrate diesel oil SMEA	% % %	94 6 -	94 5.94~5.94 0.03~0.06
Charge density (After 6 hours)		g/㎤	1.05	1.13
Explosion temperature (After 6 hours)		℃	1 926	2 790
Explosive gas pressure (After 6 hours)		MPa	2 581	2 640
Work ability (After 6 hours)		㎤	240	300
Explosion speed		m/s	2 800	3 400~3 600
Diesel oil outflow stability			1 hours	Over a week
Consolidation stability			3~4 day	More than 20 days
Explosive non-consumption		g/t	250	225

Third, the application effect of blasting agent was increased in the large open-air blast.

By increasing the physical stability of the blasting agent and increasing its power, the blasting factor increased by 10% and the explosive non-consumption ratio decreased by 11% in the large blast of 30 million ton.

Fourth, the production culture was guaranteed and the labor safety condition was improved.

In the process of production of explosives, diesel oil leaking on the floor of the production site and diesel oil exuding from Explosive saddles eliminated, thus improved the working conditions of the workers and played an important role in establishing the production culture.

In addition, the risk of fire was reduced by preventing the diesel oil from leaking during the transportation of the blasting agent.

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