Nippon Chemical Paint Co., Ltd.

Friction reducing and negative friction force reducing materials

LUB-CHEMICA®

- Friction-reducing applications, such as steel sheet piles and H steel beams, are applied to the surface to prevent the sticking of ground improvement agents and facilitate extraction.
- Measures to reduce negative friction forces in piles and loading test applications.

LUB-CHEMICA is a friction-reducing material developed by Nippon Chemical Paint.
When **LUB-CHEMICA** is pre-applied to H steel beams, steel sheet piles, piles dried and driven into the soil, the coating absorbs the moisture of soil in the ground to form a swollen body. This swollen body acts as a lubricating layer and significantly reduces friction on the coated surface.

From Bigger to Smaller Equipment
Reduce Friction and Cut Costs!

(1) **LUB-CHEMICA** is easily applied by brush and roller or air spray in factories and on-site stockyards, does not require a dedicated line.

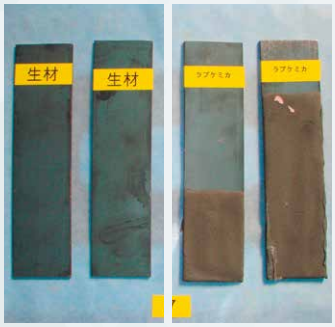
(2) The fast drying and hard coating film make it easy to handle the coated material.

Negative friction force countermeasure pile construction status.

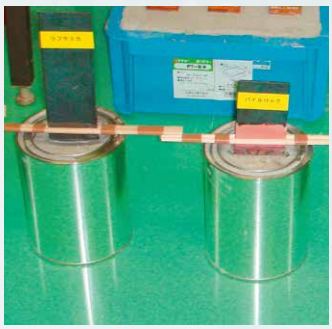
Steel sheet pile pull-out situation

Extraction performance test

Flat bars with **LUB-CHEMICA** applied, and no application were buried and cured in a mortar, and the extraction force was measured using an autograph.



Flat bar shape Test specimens



Specimens embedded in mortar

The specimen under tensile testing

The specimen after extraction

Water quality testing and inspection report

濃度計量証明書

報告書作成日　2011年3月22日
分析管理番号　S－9455－4

日本化学塗料株式会社　御中

2011年2月22日ご依頼試料の分析結果は下記の通りであることを証明いたします。

計量証明登録(濃度)　神奈川県第7号
計量証明登録(音圧レベル)　神奈川県第55号
計量証明登録(振動加速度レベル)　神奈川県第31号
作業環境測定機関　登録番号14-59
建築物飲料水水質検査業登録　神奈川県4水第1号
土壌汚染対策法指定機関　環2003-1-46

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環境計量士：柴田 智子

依頼件名	シーリング材の溶出試験
試験体名称	ラブケミカ
試験内容	H15環境省告示第18号にて溶出 土壌汚染対策法地下水項目測定

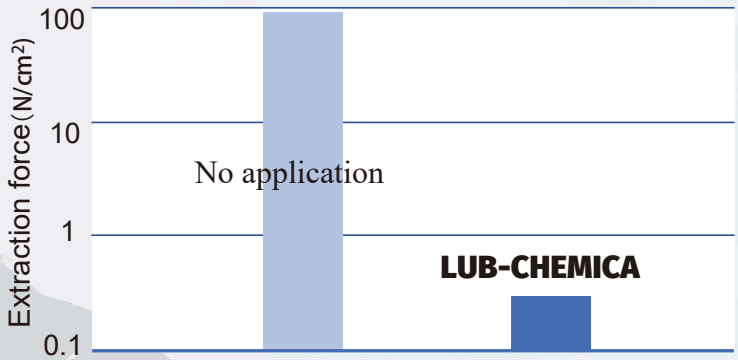
項目		検出値	定量下限値	基準値	検出方法
1. カドミウム	mg/L	不検出	0.005	0.01	JIS K 0102 55.1
2. 全シアン	mg/L	不検出	0.1	不検出	JIS K 0102 38.1.2 38.3
3. 有機燐	mg/L	不検出	0.005	不検出	S49環告第64号付表1
4. 鉛	mg/L	不検出	0.005	0.01	JIS K 0102 54.1
5. 六価クロム	mg/L	不検出	0.02	0.05	JIS K 0102 65.2.1
6. 砒素	mg/L	不検出	0.005	0.01	JIS K 0102 61.2
7. 総水銀	mg/L	不検出	0.0005	0.0005	S46環告第59号付表1
8. アルキル水銀	mg/L	不検出	0.0005	不検出	S46環告第59号付表2
9. ポリ塩化ビフェニル	mg/L	不検出	0.0005	不検出	S46環告第59号付表3
10. トリクロロエチレン	mg/L	不検出	0.001	0.03	JIS K 0125 5.2
11. テトラクロロエチレン	mg/L	不検出	0.001	0.01	JIS K 0125 5.2
12. 1,1,1-トリクロロエタン	mg/L	不検出	0.001	1	JIS K 0125 5.2
13. 四塩化炭素	mg/L	不検出	0.001	0.002	JIS K 0125 5.2
14. ジクロロメタン	mg/L	不検出	0.001	0.02	JIS K 0125 5.2
15. 1,2-ジクロロエタン	mg/L	不検出	0.001	0.004	JIS K 0125 5.2
16. 1,1-ジクロロエチレン	mg/L	不検出	0.001	0.02	JIS K 0125 5.2
17. シス-1,2-ジクロロエチレン	mg/L	不検出	0.001	0.04	JIS K 0125 5.2
18. 1,1,2-トリクロロエタン	mg/L	不検出	0.001	0.006	JIS K 0125 5.2
19. 1,3-ジクロロプロペン	mg/L	不検出	0.001	0.002	JIS K 0125 5.2
20. チウラム	mg/L	不検出	0.001	0.006	S46環告第59号付表4
21. シマジン	mg/L	不検出	0.0003	0.003	S46環告第59号付表5 第1
22. チオベンカルブ	mg/L	不検出	0.002	0.02	S46環告第59号付表5 第1
23. ベンゼン	mg/L	不検出	0.001	0.01	JIS K 0125 5.2
24. セレン	mg/L	不検出	0.005	0.01	JIS K 0102 67.2
25. ふっ素	mg/L	不検出	0.1	0.8	JIS K 0102 34.1
26. ほう素	mg/L	不検出	0.1	1	JIS K 0102 47.3

備考
不検出とは、定量下限値未満のことを示します。

※Eluted water meets the standards of the Soil Contamination Countermeasures Law

Test result

The extraction force per unit area was calculated from the test results and is shown in the graph. Compared to the uncoated product (raw material), the **LUB-CHEMICA**-applied product shows an exellent reduction of two order of magnitude. In addition, a good reduction in extraction force has also been observed in the implemented works.



Extraction force per unit area

Application volume and drying time

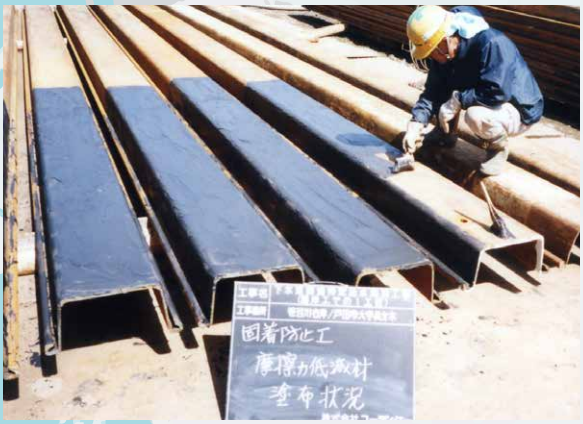
Use	Standard application amount (kg/m^2)	Drying Time @20℃(hrs)	Remarks
Extraction	1.0~1.5	15~16	Drying time varies according to temperature and humidity, with higher temperatures and lower humidity resulting in faster drying times. It also dries more quickly when there is a breeze. Apply in two coats, taking care to avoid dripping of LUB-CHEMICA.
Load test	2.0~3.0		
Negative Friction Reducing Piles	2.0~3.0		

Application

1)The objects to be painted are brought in and laid out at the painting site, cleaned of dust, dirt, oil, water and dried.
2)Apply the adjusted Lovchemica in the prescribed amount by roller, brush or spray.
3)Dry in a place free from rainwater and carry out a visual inspection of the area of application.
4)The site should be protected against rainwater and condensation until poured by blue sheets or similar.

Laying and cleaning


Painting operation/air sprey


Painting operation/brush


Painting operation/roller

Cleanability after extraction

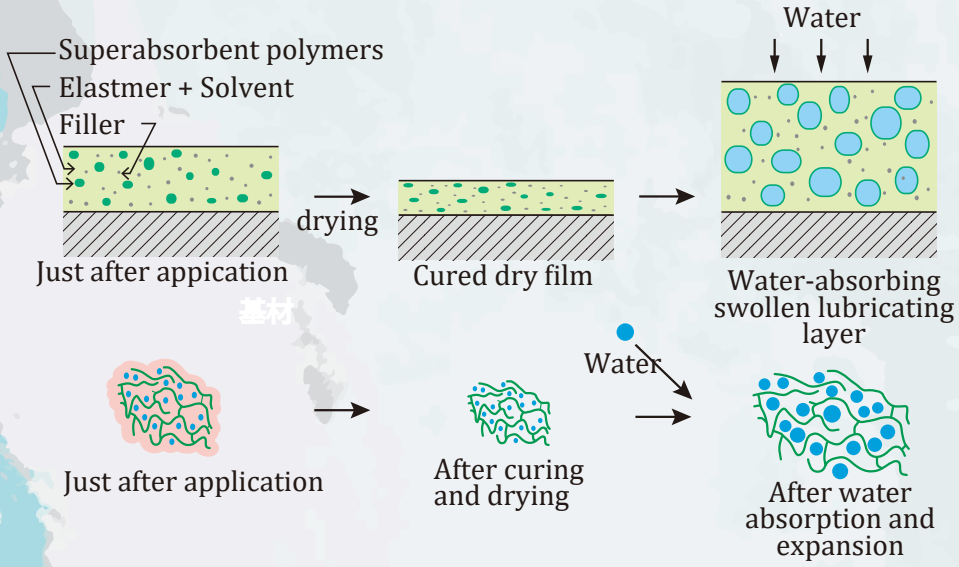
Most of the **LUB-CHEMICA** will remain in the soil at the time of extraction, with little or no **LUB-CHEMICA** or mud adhering to the surface of steel sheet piles, H steel beam. If it does stick, remove it with a scraper or similar tool. If it is difficult to clean, re-swell with water and remove with a scraper or water jet.

Packaging

LUB-CHEMICA	18kg/ can
LUB-CHEMICA thinner	16L/ can

Friction reduction mechanism

1)Just after application
Superabsorbent polymers float in the unseasoned paint film.
2)After curing and drying
Superabsorbent polymers are present in a dormant state in the solidified paint film.
3)After water absorption swelling
Superabsorbent polymers absorb water and swell the paint film.
This swollen coating acts as a lubricating layer.



State change schematic diagram