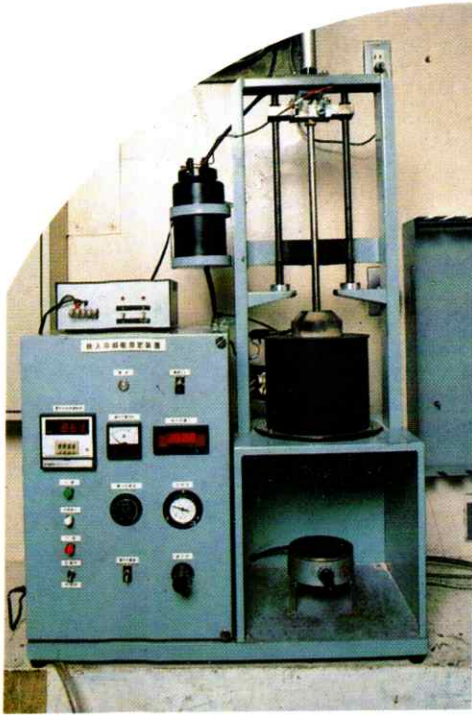




Heat Treatment Oil

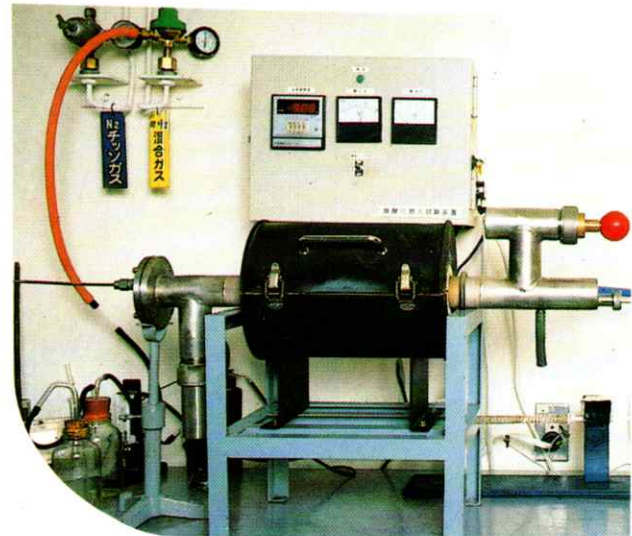


NAM YOUNG OIL CHEMICAL IND. CO., LTD.



銀棒式冷却曲線測定装置
(微分測定法도 가능)

silver Rod-type cooling Curve Measuring Equipment
(Differential measuring method is available)

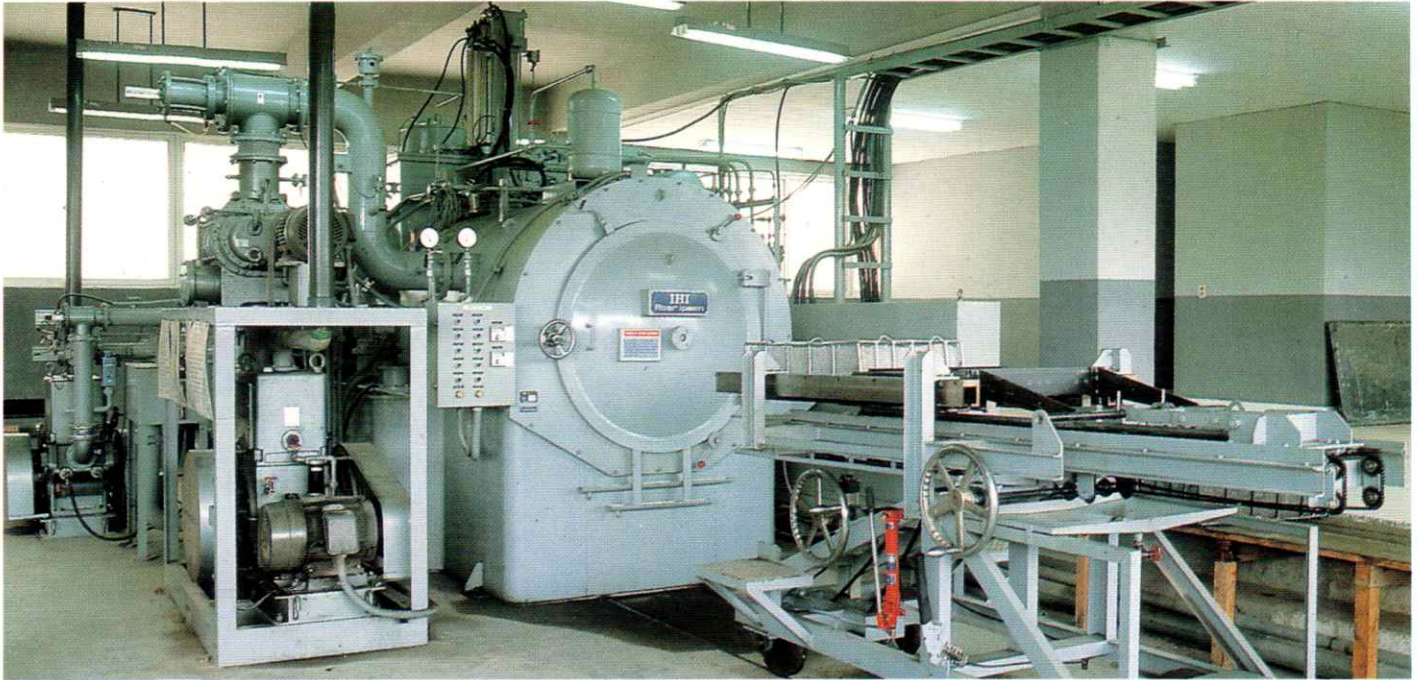


光輝度試験装置
Brightness Test Equipment

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1. 새로운 焼入冷却劑(New Quenching Coolant)



1000℃以上の焼入温度에서도 뛰어난性能を 갖る真空浸炭用焼入油は真空爐에서研究되었습니다。Quenching oil for vacuum cementation that has excellent performance at quenching temperature over 1000℃ is researched in a vacuum furnace.



火災, 公害에 뛰어난性能을 갖는水溶性冷却劑 SOL QUENCH 2000은數年の實績이 있습니다。Soluble coolant, SOL Quench 2000 that has excellent performance against fire or pollution has been operated for a few years in the factory taked in picture

2. 熱處理油一覽表(Heat-Treating Oils Catalogue)

● COLD QUENCHING (KS 1種1号, 2号) ◎특히 優秀 ○優秀하다

品名 (Product Name)	H值/inch	40℃ 粘度 (Quenching) cst	特性 (Features)				用途 (Application)
			燒入性 Quenching	歪 Crackinig	光輝性 Brightness	洗淨性 Washing	
소입유 ND (Quenching Oil ND)	0.30 ~0.32	20.0~25.0	○				一般適用鋼의 素材調質用 SALT 加熱後에도 使用됨 (Materials tempering of general steels, Used after heating salt)
H.S.Q DELUXE N70	0.37 ~0.40	17±3.2	◎		○	○	美國SUN OIL 상당품으로, 세계적으로 著名한 HIGH SPEED QUENCHING OIL임. (Compatible to SUN OIL, U.S.A. well-known high speed quenching oil)
H.S.Q DELUXE NT	0.37 ~0.40	16.0±3.2	◎		○	○	모든 鋼種의 燒入에 適合함. 補充油가 적게드는 게 特徵 (Suitable for quenching of all kinds of steels, Little refilling oil needed)
H.S.Q DELUXE PT	0.37 ~0.40	17±3	◎		○	○	모든 鋼種의 燒入에 適合함. (High Speed Quenching Oil)
H.S.Q DELUXE N	0.37 ~0.40	19±2.8	◎				鍛造部品の 燒入 및 鍛造燒入用 低原價, 超HIGH SPEED QUENCHING用 (Quenching of forged parts and forging quenching. Low-cost, super high speed quenching)
H.S.Q DELUXE SX	0.40 ~0.42	16~25	◎				超冷却性(물과 一般 HIGH SPEED QUENCHING油 中間)을 가지며 航空機部品の 用의 高級品 (Excellent property of cooling(Between water and general high speed quenching oil) and deluxe goods of airflight parts.)
소입유 70N (Quenching Oil)	0.32	17±2.9	○	○	○	○	油噴射燒入, 特히 QUENCHING Press用, SALT加熱後의 光輝燒入에도 特性을 發揮함. (Brightness Quenching after heating salt. Oil spray quenching and especially for quenching press)
소입유 N-1 (Quenching Oil)	0.28 ~0.30	15~25	○	○			SPRING用, 一般의 素材調質과 合金鋼의 小部品 및 燒入性이 좋은 鋼種用 (For spring, materials tempering, small parts of alloys and steels having excellent tempering)
H.S.Q DELUXE NP	0.35	21.4~26.6	◎				모든 鋼種의 燒入에 適合함, 特히 浸炭 PIT爐用, 大形Bearing Race用. (Suitable for quenching of all kinds of steels. Cementation pit furnace. Large-size Bearing Race.)
H.S.Q DELUXE NPL	0.37	17±3.2	◎		○	○	一般燒入外에 油噴射燒入, 循環攪拌油槽 및 SALT 加熱後에 適合함. 도금 部品用 (Suitable after oil spray quenching, circulating agitator oil bath, salt heating, coating part.)
광휘소입유 SL (Brightness Quenching Oil)	0.32	16~26	○	○	◎	○	GAS浸炭燒入, Bearing Race의 光輝燒入用 (Gas Cementation Quenching, Bright Quenching of Bearing Race.)
광휘소입유 (Brightness Quenching Oil)	0.32	16~26	○	○	◎	○	霧圍氣燒入, 特히 光輝燒入에 使用되며 燒歪가 없는 燒入油, 精密部品, Bearing Race用. (Atmosphere quenching. Used in brightness quenching. Quenching oil without any burn. Precision parts, Bearing Race)
광휘소입유 1050N (Brightness Quenching Oil)	0.38 ~0.35	20.0~28.0	○		◎	◎	一般霧圍氣爐에 依한 熱處理作業 및 精密한 熱處理 作業用, 等 廣範圍하게 使用됨. (Heat-treating work and Precision work by general atmosphere furnace used widely in all areas.)
광휘소입유 H (Brightness Quenching Oil)	0.35	18.0±2.9	◎		◎		GAS 浸炭燒入, 特히 燒入性이 要求되는 精密部品 및 浸炭Bearing用. (GAS cementation Quenching Precision-parts and cementation Bearing.)

• SEMI HOT QUENCH OIL (KS 2種1号), • MAR TEMPER OIL (KS 2種2号),

品名 (Product Name)	H值/inch	100℃ 粘度 (Quenching) cst	特性 (Features)				用途 (Application)
			焼入性 Quenching	歪 Cracking	光輝性 Brightness	洗淨性 Washing	
HOT QUENCH DELUXE N-300	0.33	7.1±3.6	◎	○	◎	○	MODIFIED MAR QUENCH用 油溫 80~120℃가 適溫 (Modified mar Quench(80 to 120℃ of oil temperature))
HOT QUENCH DELUXE N-809	0.28	7.1±3.6	◎	◎	◎	○	HOT QUENCH300씨-리즈중의 한 製品, 베어링 레-스用 (One of Hot Quench 300 series. Bearing)
HOT QUENCH DELUXE N-58E	0.30 ~0.35	12.5±3.1	◎	◎	◎	○	高溫에서는 MAR TEMPER油로서 使用되는 一般 高性能 HOT QUENCH OIL, 특히 酸化重合에 安定됨. (High-performance hot quench oil used as mar temper oil at high temperature Especially, stable in oxidation compound)
DELUXE MAR TEMPER油(OIL)	0.23	332±3.7	○	◎	◎		GAS浸炭 MAR TEMPER, 光輝 MAR TEMPER處理 Bearing用으로 特性을 發揮하는 MAR TEMPER油임. (Gas cementation mar temper. Brightness Mar temper treating Bearing)
DELUXE MAR TEMPER OIL NS	0.24	25.8±2.5	○	◎	◎		GAS浸炭 MAR TEMPER 光輝 MAR TEMPER處理, Bearing用에 特性을 發揮함 (Gas cementation mar temper Brightness Mar temper treating Bearing)
DELUXE MAR TEMPER OIL NL	0.24	23.3±2.5	○	◎	◎		모든 調整雰圍氣의 光輝 MAR TEMPER用 (Bright Mar Temper of all control atmosphere)
DELUXE MAR TEMPER N99	0.26	17.9±2.6	○	◎	◎		120~150℃에서 SCM21以上の 燒入性鋼種의 自動車部品等의 GAS 浸炭 MAR TEMPER處理用 (Gas quenching Mar temper treating of autompbile parts of quenching steels over SCM21 at 120 to 150℃)
DELUXE MAR TEMPER OIL SL	0.24	23.3±2.5	○	◎	○		浸炭 MAR TEMPER處理, PIT爐 (Cementation Mar temper Treat Pit furnace)
DELUXE MAR TEMPER No.2	0.24	23.3±2.5	○	◎	○	○	GAS浸炭 MAR TEMPER處理, SALT加熱後의 MAR TEMPER處理用. (Gas quenching Mar temper treating Mar temper treating after beating salt.)

推獎油溫은 燒入油의 使用油溫과 燒入鋼烈度 (H值)의 項參照

For recommended oil temperature, refer to oil temperature of quenching oil and quenching hardness value.

• TEMPER油(Oil)

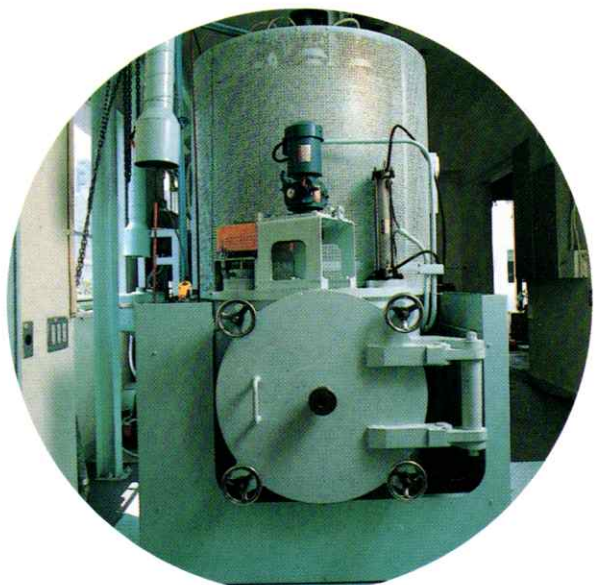
品名 (Product Name)	粘度(Viscosity) 40℃ cst.	引火点 (Flash Point) °C	特性 (Features)	用途 (Application)
TEMPER油 No. 2	25.8±2.4	270以上	熱安定性이 좋고 脫炭되지 않음. 高溫의 均一保持가 可能함. (Excellent Heat-stability evenly Possible to maintain temperature)	油溫200℃~250℃의 TEMPER用 Temper of oil bath 200 to 250℃
TEMPER油 No. 3	35.7±3.7	300以上	熱安定性이 좋고 脫炭되지 않음. 高溫의 均一保持가 可能함. (Excellent Heat-stability evenly Possible to maintain temperature)	250℃~300℃의 TEMPER用 Temper 250 to 300℃

●眞空焼入油・眞空浸炭焼入油(VACUUM QUENCHING OIL, VACUUM CEMENTATION QUENCHING OIL)

品名 (Product Name)	粘度(Viscosity) 100℃ cst.	H値 1/inch	特性 (Features)	用途 (Application)
眞空焼入油 N-700 (VACUUM QUENCHING OIL N-700)	15.5±3.1	0.37 ~0.40	冷却性能이 높으며 熱安定性이 좋다. (High cooling Performance and excellent Heat stability)	특히 焼入性에 重点을 둔 境遇의 眞空CASE의 焼入에도 使用됨 (Used in quenching except for vacuum case that quenching is based)
眞空焼入油 N-900 (VACUUM QUENCHING OIL N-900)	25±3.7	0.32	光輝性이 優秀하다. 減壓下에서도 優秀한 冷却性能을 가지고 있다. (Excellent Brightness Excellent cooling Performance under pressure)	焼入溫度 1000℃ 以上の 境遇 (In case of 1000℃ and over of quenching is based)
眞空焼入油 N-900S (VACUUM QUENCHING OIL N-900S)	25±3.7	0.32	光輝性이 優秀하다. 高溫焼入時의 安定性이 特히 優秀하다. (Excellent Brightness Especially, excellent stability in high temperature quenching)	焼入溫度 1000℃ 以上の 境遇, 眞空浸炭 및 光輝性을 重視하는 高級品 (In case of 1000℃ and over of quenching temperature, deluxe goods in that vacuum cementation and brightness are important)

●水性冷却劑(WATER COOLANT)

品名 (Product Name)	使用倍率 (Rate)	特性和 主된 用途 (Characteristics and Main Application)
수용성QUENCH N-2000 (Soluble Quench N2000)	10~40%	直接焼入, 安定性이 좋음. 高周波焼入用으로는 2000를 使用하십시요. (Direct Quenching and good stability. Use 2000 for high-frequency quenching)
수용성QUENCH N-1100 (Soluble Quench N1100)	2~10%	高周波焼入, 熱安定性이 優秀하며 또한 防錆性도 優秀함. (High-frequency Quenching, Excellent stability and anti-corrosion)
수용성QUENCH N-1100 SS (Soluble Quench N1100)	2~7%	高周波焼入, 1100의 防錆性을 向上시킨 製品 (High-frequency Quenching, more elevaten than 1100 in anti-corrosion)
수용성QUENCH N-1400 SS (Soluble Quench N1400)	10~30%	直接焼入 (Direct Quenching)



眞空爐兼用 ALL CASE TYPE 熱處理爐
vacuum furnace-all case type heat-treating furnace.

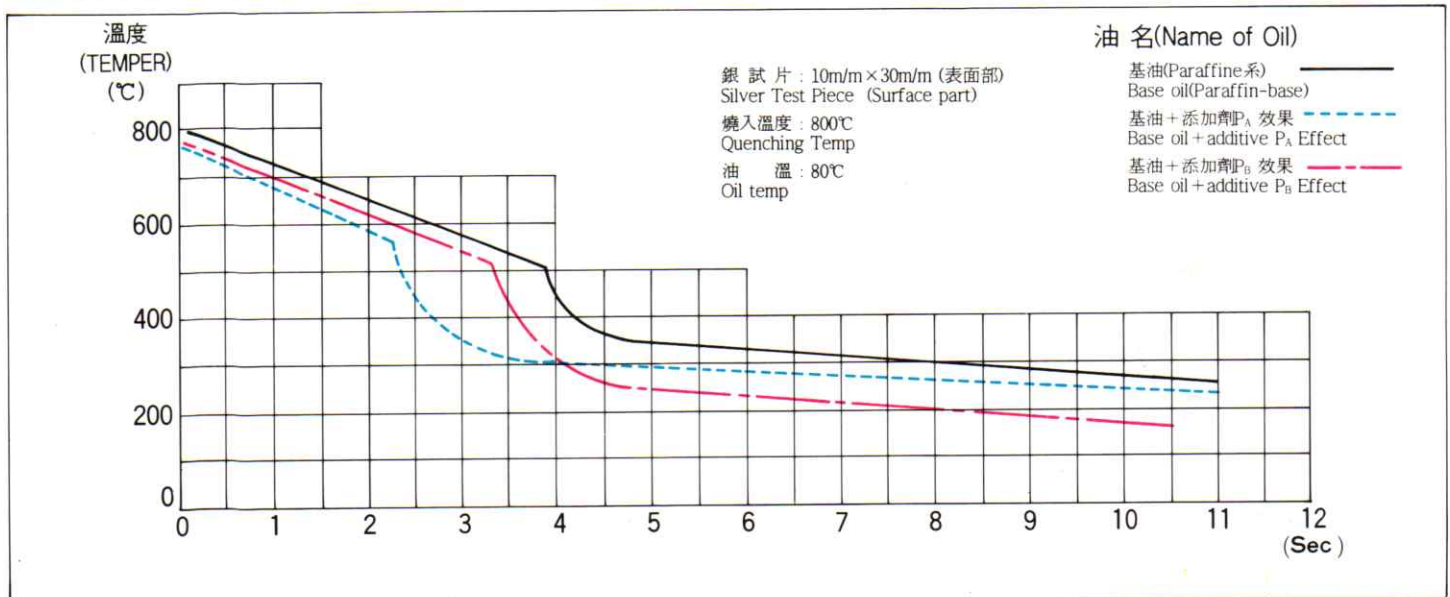
- ④ 光輝度 熱處理油老化生生物(過酸化, SLUDGE)의 生成程度에 따라서 相異하나, 이것을 無酸化 Gas加熱한 金屬片을 燒入하여 塔붙은 老化生成物의 狀態를 觀察하고 1(最良)~0.4(黑色)의 數值로 表示한다.
- ⑤ 粘度 HOT QUENCH, MAR QUENCH OIL에서는 冷却曲線과 같이 管理의 對象으로 한다.
- ⑥ 氣泡 循環펌프 攪拌機의 프로펠라等的의 依하여 氣泡가 發生하며는 燒入性 等에 惡影響을 미치게 됨으로 注意할 必要가 있음.
- ⑦ 試料採取 特히 事故發生의 境遇에는 停止狀態일때(1時間以上 停止 油槽의 밑 部分)과 攪拌했을때의 두가지 條件下에서 採油할것.(0.5~1ℓ)

- ④ Brightness Degree It varies in accordance with generation degree of heat treating oil aging products(Peroxides, sludge)but it will be indicated by No.1.(Excellent)-0.4(Black color)after seeing the condition of aging products burned after bet quenched weith metal test piece heated by non-oxidation gas.
- ⑤ Viscosity It will be controlled as cooling curve in hot quench, mar quench, etc.
- ⑥ Bubble When it is bubbled by a propeller, etc of circulation pump agitator, take notice so that it badly may not affect quenching, etc.
- ⑦ Sample Handing Especially, extract oil(0.5-1ℓ)in the condition under stop (bottom part of oil bath in the stop of 1 time a over)and agitation.

●燒入油의 添加劑의 種類와 그 效果(燒入油添加劑 T-S)
(Kinds of additives of quenching oils and the effect.(Quenching Oil Additives T-S))

添加劑(Additives)	特性和 效果 (Characteristics and Effect)
P ^A	特性溫度를 上昇시킨다. 炭素鋼·低合金鋼의 燒入에 그 效果를 發揮함.(下圖參照) Will make the special temperature risen and show the effect on quenching of carbon steel and low alloy steel. (Refer to the drawing below)
P ^B	對流段階의 冷却能을 높임. 下部 Benite 發生을 沮止하고, 大型部品の 燒入에 效果를 發揮함.(下圖參照) Elevate cooling Performance of convection stage and Prevent Benite happening of lower part and show the effect on the quenching of big-size parts.
P ^C	油中에 生成하는 SLUDGE의 分散을 좋게하여 燒入油의 洗淨性을 向上시킨다. Make the dispersion of sludge and raise washing property of quenching oil.
P ^D	燒入油의 光輝性을 向上시킨다. Elevate the brightness of quenching oils.
P ^E	燒入油의 酸化防止, 光輝性·冷却性의 安定性을 向上시킨다. Prevent oxidation of quenching oil and elevate brightness and stability of cooling
P ^F	特性溫度를 向上시켜, 光輝性을 向上시킨다. Elevate brightness by raising special temperature
P ^G	減壓下의 使用에 있어서도, 油의 分解를 沮止하는 光輝性向上劑 In case of using it under pressured condition, it will prevent dispersion of oils as a agent that lifts up brightness.

添加劑에 依한 冷却性能向上의 例(Example of cooling performance rising by additives)

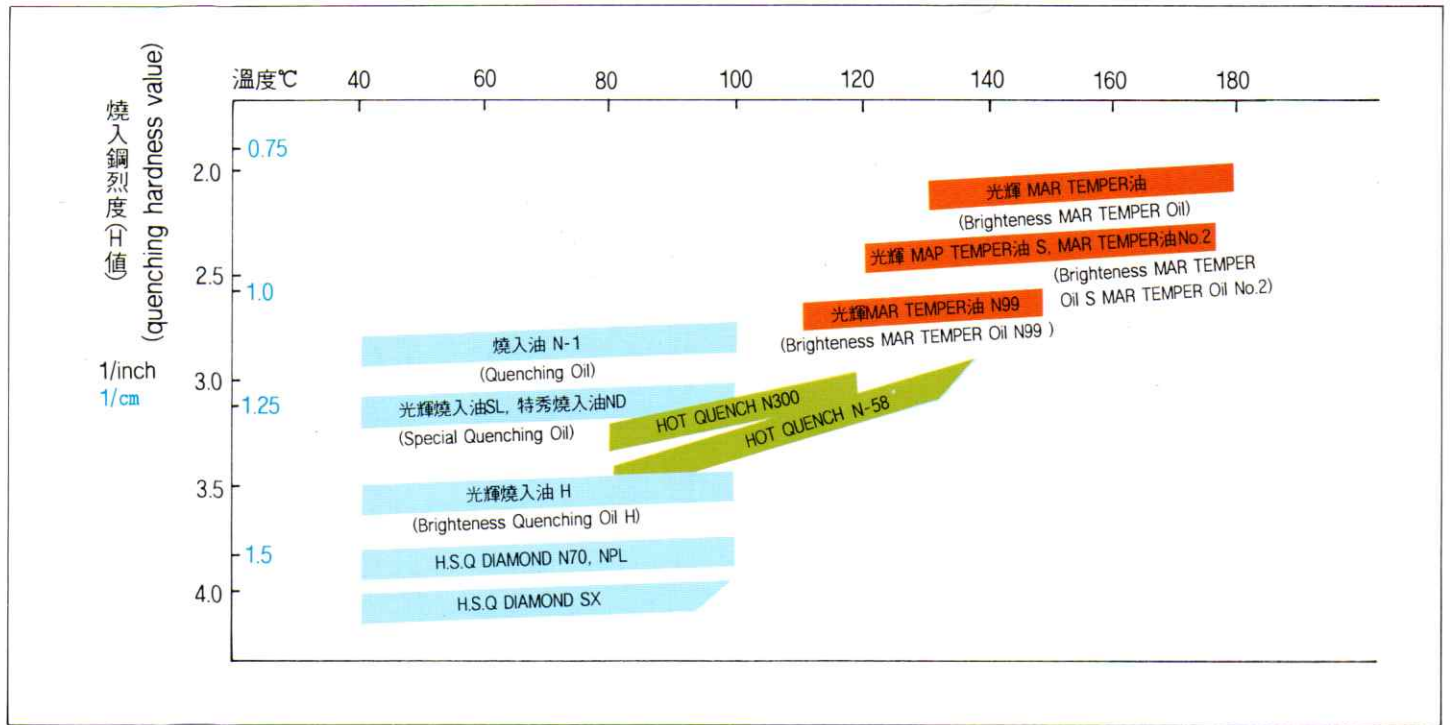


3. 이런 TROUBLE에는 이런 應急處置를! (Trouble Shooting)

—燒入油에 原因이 있을 境遇—
(—In case of causes owing to quenching oil—)

트러블상태 (Troubles)	체크하는 性狀 (States to check)	原 因 (Causes)	對策과 處置 (Trouble Shooting)
燒入冷却性能의 低下 (Decline of quenching cooling performance)	冷却曲線 (Cooling Curve) SLUDGE 水分(Water content) 粘度(Viscosity)		添加劑에 依하여 補正 濾타에 依한 여과 處理 脫水處理 性狀試驗에 依한 處置法을 決定한다 (Dewatering and filtering treatment by repairing filters by additives. Decide treating method by property test)
Crack의 發生 (Happening of crack)	水分(Water content) 冷却曲線(Cooling Curve)	水分 0.05~0.1%의 混入 冷却性能의 上昇 (Mixing of water content of 0.05 to 1.0% Rising of cooling performance)	脫水處理 適正한 冷却性能으로 修正 (Dewatering Treatment. Modify it to an adequate cooling performance)
光輝性의 低下 (Decline Brightness)	光輝度(Brightness) 水分(Water content) SLUDGE 殘留炭素(Remaining carbon)	劣化生成物의 蓄積 (Accumulation emulsion product)	脫水, filter-處理外에 添加劑에 依한 補正 또는 更油 (Except for dewatering, filter Repair or changing oil by additives)
燒入變形의 增加 (Increase quenching change)	冷却曲線(Cooling curve) 粘度(Viscosity)		適正한 冷却性能으로 修正 또는 更油 (Repairing or changing oil to an adequate cooling performance)
着火가 容易하게 됨 (Easy firing)	引火点 (Flash Point)	1) Cold Quench의 境遇 (輕質油의 混入 또는 熱分解) 2) Hot Quench의 境遇 (GAS浸炭 PIT油槽에 傾向이 있음) 1) In case of cold quench.(Mixing of light stocks geat-resolution) 2) Incase of Hot quench.(Slant in gas quenching pit oil bath)	更油 (使用油溫 +80℃ 보다 낮아졌을때) Changing oil (Lower than 80℃ plus using temperature)
	水分 (Water content)	混水에 依한 引火点의 低下 (불꽃이 튀는듯 着火가 甚함) Decline of flash point by mixed water (Firing is severe as flame sparkle)	脫水處理 (Dewatering treatment)
	油溫上昇 (Rising of oil temperature)	1회의 燒入으로 35~40℃ 以上昇溫하는 境遇 熱分解가 크다. (Heat resolution is great in when the temperature is rising over 35 to 40℃ per quenching)	보조TANK를 설치하여 유량을 증가시킴 (Adding oil flow by installing assisting tank)
	氣泡 (Bubble)	氣泡의 混入 (Mixing of bubble)	1) 순환Pump의 Suction부의 Packing의 늘어짐을 고침 2) 교반기의 회전수를 낮춤 1) Correct the packing losing of suction part of circulation pump 2) Put down the rotation number of agitator

- 燒入油의 使用油溫과 燒入鋼熱度(H值)
(Using Temperature & quenching hardness value of quenching oil)



4. TECHNICAL MEMO —熱處理油를 技術的으로 알고저 하시는 分을 爲하여— (—For the customers who want to know about heat treating oils technically—)

- 熱處理油의 管理 (Control of Heat-treating Oils)

油種 (Kind of Oil)	체크 포인트 (Check Point)		
COLD QUENCH OIL KS 1種(KS 1KIND)	水分 (Water Content)	冷却曲線(Cooling Curve)	SLUDGE (光輝度) (Brightness Degree)
HOT QUENCH OIL 2 種(KS 2KIND)	水分 (Water Content)	粘度 (冷却曲線) (Viscosity (Cooling Curve))	SLUDGE (光輝度) (Brightness Degree)

其他 必要에 따라서, 引火点 · 殘留炭素 · 燃燒点을 測定한다.
(For other necessary items, measure flash point, remaining carbon, burning point)

要 点(Key Point)

- ① 水分 冷却装置, 補充油 Drum, 溫度變化에 依한 空氣中の 水分이 結露하여 油槽에도 混入됨.
그結果 燒割, 燒歪, 硬度不足, 硬度不均一, 着火容易, 光輝性低下의 原因이 됨.
- ② 冷却曲線 ㉠ 酸化, 重合, 또는 熱分解에 依한 低分子의 發生으로 對流段階에 變化를 發生케함.
㉡ 添加劑의 老化 또는 沸騰段階에 있어서의 選擇的인 持出로서 變化함.
- ③ SLUDGE 基油 및 添加劑의 老化에 依하여 發生하나 燒入油槽의 油表面의 酸素의 有無에 依하여 甚한 差가 있음.
但, 炭化物은 金屬表面에서 熱의 不良度体 때문에, 硬度 不足의 原因을 만든다.

- ① Water Content Dewed by water content in air by cooling equipment, supplementation oil, drum, temperature change and mixed into oil bath.
- ② Cooling Curve ㉠ Caused any change to happen in convection stage owing to the happen of low molecule by oxidation, compounding or heat resolution.
㉡ Aging of additives or change on the boiling stage.
- ③ Sludge It may be produced by the aging of base oil and additives but varies widely thanks to the presence of oxygen on oil surface of quenching oil bath.
But, carbides bring about hardness shortage owing to bad quality conductor of heat on metal surface.

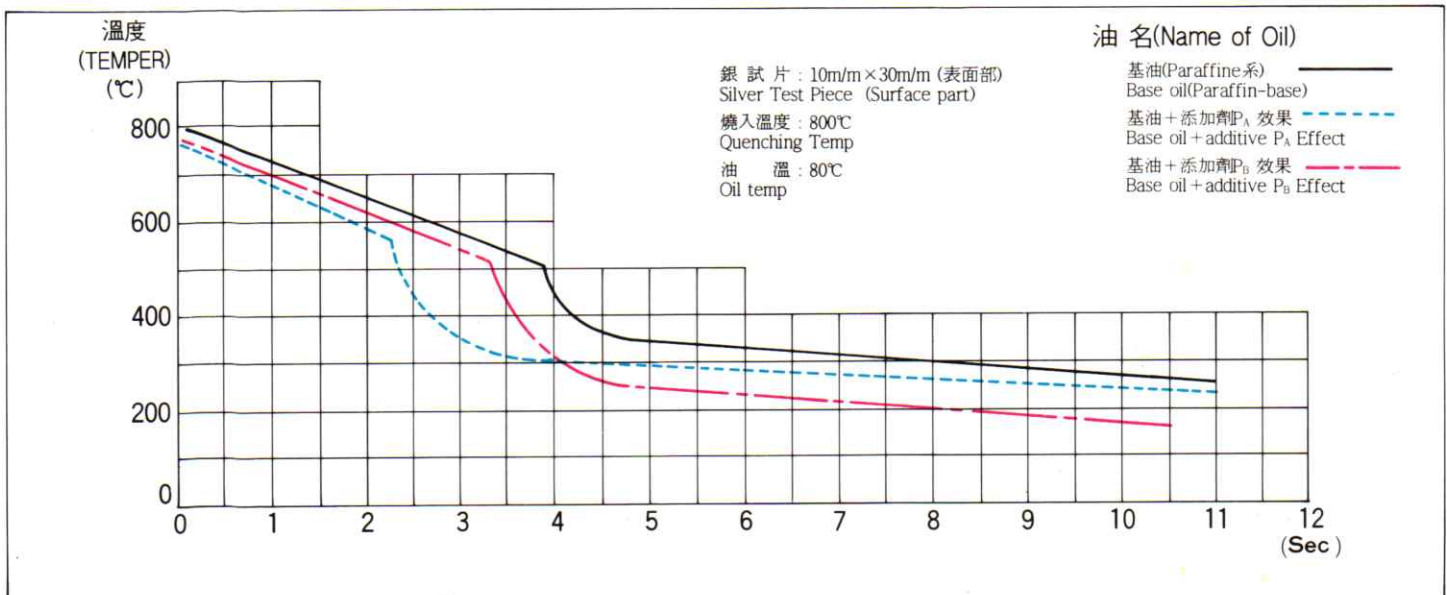
- ④ 光輝度 熱處理油老化生性物(過酸化, SLUDGE)의 生成程度에 따라서 相異 하나, 이것을 無酸化 Gas加熱한 金屬片을 燒入하여 타붙은 老化生成物의 狀態를 觀察하고 1(最良)~0.4(黑色)의 數値로 表示한다.
- ⑤ 粘 度 HOT QUENCH, MAR QUENCH OIL에서는 冷却曲線과 같이 管理의 對象으로 한다.
- ⑥ 氣 泡 循環펌프 攪拌機의 프로펠라等的의 依하여 氣泡가 發生하며는 燒入性 等に 惡影響을 미치게 됨으로 注意할 必要가 있음.
- ⑦ 試料採取 特히 事故發生의 境遇에는 停止狀態일때(1時間以上 停止 油槽의 밑 部分)과 攪拌했을때의 두가지 條件下에서 採油할것.(0.5~1ℓ)

- ④ Brightness Degree It varies in accordance with generation degree of heat treating oil aging products(Peroxides, sludge)but it will be indicated by No1.(Excellent)-0.4(Black color)after seeing the condition of aging products burned after bet quenched weith metal test piece heated by non-oxidation gas.
- ⑤ Viscosity It will be controlled as cooling curve in hot quench, mar quench, etc.
- ⑥ Bubble When it is bubbled by a propeller, etc of circulation pump agitator, take notice so that it badly may not affect quenching, etc.
- ⑦ Sample Handling Especially, extract oil(0.5-1ℓ)in the condition under stop (bottom part of oil bath in the stop of 1 time a over)and agitation.

●燒入油의 添加劑의 種類와 그 效果(燒入油添加劑 T-S)
(Kinds of additives of quenching oils and the effect.(Quenching Oil Additives T-S))

添加劑(Additives)	特性和 效果 (Characteristics and Effect)
P ^A	特性溫度를 上昇시킨다. 炭素鋼·低合金鋼의 燒入에 그 效果를 發揮함.(下圖參照) Will make the special temperature risen and show the effect on quenching of carbon steel and low alloy steel. (Refer to the drawing below)
P ^B	對流段階의 冷却能을 높임. 下部 Benite 發生을 沮止하고, 大型部品の 燒入에 效果를 發揮함.(下圖參照) Elevate cooling Performance of convection stage and Prevent Benite happening of lower part and show the effect on the quenching of big-size parts.
P ^C	油中에 生成하는 SLUDGE의 分散을 좋게하여 燒入油의 洗淨性을 向上시킨다. Make the dispersion of sludge and raise washing property of quenching oil.
P ^D	燒入油의 光輝性을 向上시킨다. Elevate the brightness of quenching oils.
P ^E	燒入油의 酸化防止, 光輝性·冷却性의 安定性을 向上시킨다. Prevent oxidation of quenching oil and elevate brightness and stability of cooling
P ^F	特性溫度를 向上시켜, 光輝性을 向上시킨다. Elevate brightness by raising special temperature
P ^G	減壓下의 使用에 있어서도, 油의 分解를 沮止하는 光輝性向上劑 In case of using it under pressured condition, it will prevent dispersion of oils as a agent that lifts up brightness.

添加劑에 依한 冷却性能向上의 例(Example of cooling performance rising by additives)



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