

HIGH TEMPERATURE CERAMIC CEMENTS

ENGINEERED FOR PERFORMANCE



SAUEREISEN

TRANSFORMING CONCEPT TO REALITY

In 1899 C. Fred Sauereisen chose to take his interest in ceramics one step further by applying his knowledge and developing a signature product that would serve as the core of an entire product line. The introduction and success of Insa-Lute Adhesive Cement No. 1 launched the Sauereisen Cements company. This breakthrough was only the beginning of what would rapidly grow to be an internationally known manufacturer and

distributor of engineered products. A century later, this original product is still used extensively in the automotive and appliance industries. This kind of excellence defines our company and distinguishes Sauereisen in the field of specialty cements.

In time, C. Fred brought his sons to work with him and continued the dream of building a prosperous company. The second and third generation owners and professional

management team continue to supply new and innovative ideas while maintaining the historical values that represent Sauereisen's strong foundation.



WHAT'S IN A NAME?

When you consider that a company name is branded by the quality and reliability of the

products it manufactures, there's a lot to be said about "what's in a name". Through a century of consistent research, innovation and quality control, Sauereisen has developed a worldwide reputation as a leading manufacturer of high performance specialty cements. Our complete family of more than twenty inorganic adhesives and potting compounds is engineered to meet specific requirements.

Our line of high temperature performance cements is used for bonding ceramic, metal and glass in the electrical, mechanical, metallurgical and sensors/instruments markets. Sauereisen materials withstand temperatures to 3000°F (1649°C), making them ideal for the most challenging assembly, encapsulation and sealing applications.



QUALITY THAT MEASURES UP

We carefully select the raw materials that go into our products to assure maximum quality. The composition of our proprietary Zircon, Silica and Alumina fillers is the highest purity available, resulting in consistent physical properties.

Strict quality assurance parameters mandate that we test every batch of material for shrinkage, strength and working time. Our customers rely on manufactured quality that is continuous from batch to batch.



CERAMIC CEMENTS

THERE ARE THREE MAIN CATEGORIES OF SAUERISEN CERAMIC CEMENTS

AIR SETS

These products are best suited for thin film bonding and coating applications from 2 to 125 mils. Because the curing mechanism involves the evaporation of water, working time is indefinite and final cure occurs between 18 and 24 hours. If a faster cure is desired, heat will accelerate the process. Great for assembly line applications. Air-set products are all single component silicates available in either paste or powder form.



Products in this category

- Insa-Lute Adhesive Cement Nos. 1 and P-1
- Aluseal Adhesive Cement No. 2
- TempSeal Cement No. 3
- Electric Heater Cement No. 6
- Insa-Lute Hi-Temp Cement No. 7
- Adhesive Paste No. 19
- Electric Resistor Cement Nos. 78 and P-78

Typical Applications

- Infrared radiant heaters – adhesion of heating coil to various substrates
- Igniter tip assembly – adhesion of igniter tip to ceramic
- Circuit breakers – cementing metal contact leads
- Sensors – bonding glass to metal alloys
- High temperature filters – adhesion of filter to metal housings

CHEMICAL SETS

These products are best suited for potting, bonding and casting applications because they contain a catalyst and harden in a large mass or thickness. Cure time can be manipulated through the introduction of heat or energy to suit the need of the user. Chemical set products are either single component powders to be mixed with water, or two individually packaged components to be combined prior to use.



array of wire types, glass configurations, and ceramics.

- Flotemp Cement No. 4
- Electrotemp Cement No. 8
- Insultemp Cement No. 10
- Thermal Potting Cement No. 11
- Electric Insulating Cement No. 12
- Zircon Potting Cement No. 13

Silicates—products that contain a silicate binder improve bonding properties.

- Low Expansion Cement No. 29
- Cement No. 31
- Sealing Cement No. 335
- Electric Refractory Cement No. 350
- Refractory Coating No. 360

Magnesium Oxysulfate—products of this type expand slightly while curing

- Plastic Porcelain No. 30
- Electrical Cement No. DW-30

Products in this category
Phosphate-bonded—phosphate-bonded materials are compatible with the broadest



Typical Applications

- Lighting/Lamps – potting of bulbs into lamp housing
- Resistors – encapsulation of resistor wiring
- Furnace maintenance – lining for surface of furnace door and walls
- Thermocouples – assembly of thermocouple components
- Igniters – bonding and potting of ferrous or nonferrous elements into ceramic substrates
- Heating elements – potting elements into a base

HYDRAULIC SETS

Products are generally used for casting or potting applications. Hydraulic set materials possess minimum shrinkage and withstand high temperatures. Curing is aided by a humid environment and commences within 24 hours. Precautions such as covering help to aid in curing by retaining moisture. These products are single component calcium aluminates.

Products in this category

- Electric Refractory Cement No. 75
- Electrical Potting Cement No. 76

Typical Applications

- Resistors – potting of resistor in ceramic housing
- Molding compounds – construction of special shapes



Selection Criteria for Choosing the Right Ceramic Cement

1. What is the application? (type of unit, equipment, etc.)
2. What degree of electrical resistance is required? (high, moderate or low)
3. What temperature range must the cement withstand? (highest to lowest)
4. What degree of thermal shock resistance is required?
 - How fast does the cement go from one temperature extreme to another?
 - What is the frequency of cycling? (how many times a day, etc.)
 - Is quench employed? (cold air, water, etc.)
5. What degree of thermal conductivity is desired?
6. What degree of thermal expansion is allowable?
7. What materials will the cement contact? (ceramics, glass, metals, etc.)
8. What degree of volume stability is required?
9. Is the cement to be used for casting, coating, bonding, assembling, encapsulation, potting or sealing application, or in some combination of these? Is a thick or thin film more desirable?
10. Is moisture absorption a problem?
11. How do you wish to dispense?
12. What pot life (working time) is required?
13. What set times are desired? Can you force-cure the cement?
14. What size batch meets your production requirements?

FEATURES AND BENEFITS

At a glance, here are some of the characteristics that make our ceramic cements so unique.

FEATURES	BENEFITS
Maximum Continuous Service Temperature up to 3000°F	Exhibits up to 15 times the temperature resistance of most epoxies.
Strong Electrical Insulation Properties for Sealing Applications	Dielectric strengths surpassing 100 volts/mil.
High Thermal Conductivity	K-Values up to 20 BTU in./ft. ² hr. F° transmits heat where needed.
Superior Thermal Shock Resistance	Tolerates instantaneous temperature swings in excess of 2000°F.
Choice of Setting Mechanisms	Chemical-set and hydraulic-set cements are most suitable for potting and bonding applications. Air-sets have unlimited pot life and are recommended for coating and sealing applications.
Non-Toxic	Absence of strong fumes and risk to skin sensitivity. No VOCs.
Non-Flammable, Combustible	Completely safe for use in any electronic or industrial facility.
Alternate Dispensing Methods	Depending upon application requirements, material may be applied by pump, brush, syringe or automatic dispensing equipment.

GROWING WITH TECHNOLOGY

There are always customers with unique challenges that require custom solutions. Sauereisen's Research Priority Team will work

to modify formulations or pursue new technology in order to meet specific parameters.



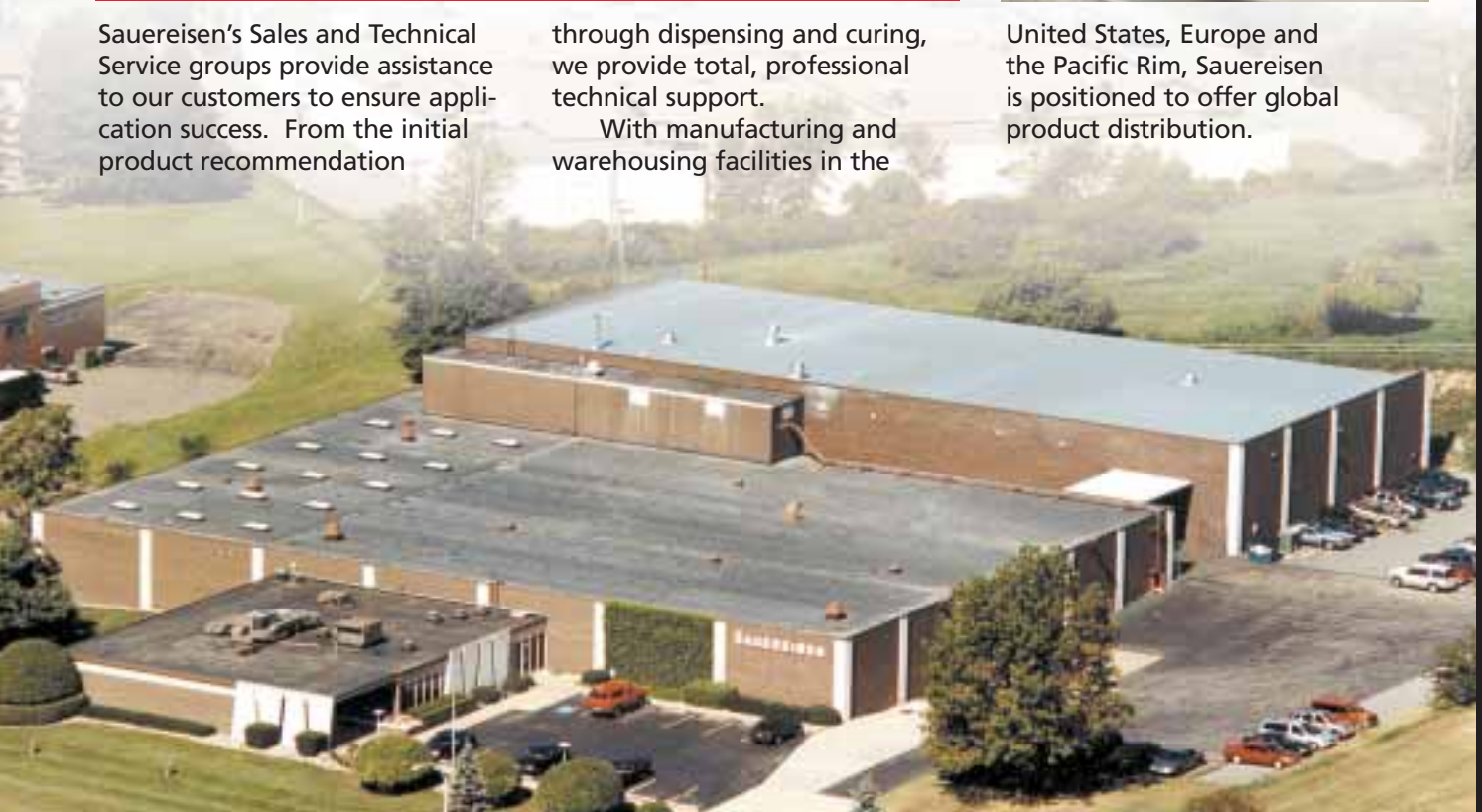
THE TEAM APPROACH

Sauereisen's Sales and Technical Service groups provide assistance to our customers to ensure application success. From the initial product recommendation

through dispensing and curing, we provide total, professional technical support.

With manufacturing and warehousing facilities in the

United States, Europe and the Pacific Rim, Sauereisen is positioned to offer global product distribution.



INORGANIC CERAMIC CEMENTS

TYPICAL PROPERTIES OF SAUEREISEN INORGANIC CERAMIC CEMENTS FOR HIGH TEMPERATURE

PRODUCT NO.	MAX. SERVICE TEMP. @ (°F)	COEFFICIENT OF THERMAL EXP. (F°)	DIELECTRIC STRENGTH (@70°F volts/mil)	VOLUME RESISTIVITY (@70°F ohm-cm)	THERMAL CONDUCTIVITY (Btu. In/ft²hr. F°)
AIR SETS					
1	1800	6.2 X 10 ⁻⁶	12.5 – 51	10 ⁸ - 10 ⁹	11.5 – 7.6
P-1	1800	6.2 X 10 ⁻⁶	12.5 – 51	10 ⁸ - 10 ⁹	10.5 – 7.0
2	3000	7.6 X 10 ⁻⁶	48 - 55	10 ⁸ - 10 ¹⁰	23.2 – 12.6
3	2200	3.4 X 10 ⁻⁶	50-100	10 ⁶ - 10 ⁸	23.0 - 13
6	2500	N/A	12.5 – 51	10 ⁷ - 10 ⁸	N/A
7	2500	6.0 X 10 ⁻⁶	12.5 - 51	10 ⁸ - 10 ⁹	N/A
19	1800	N/A	N/A	N/A	N/A
78	2600	3.7 X 10 ⁻⁶	12.5 - 51	10 ⁶ - 10 ⁸	6.8 – 7.8
P-78	2600	3.7 X 10 ⁻⁶	12.5 - 51	10 ⁶ - 10 ⁸	5.4 – 6.2
CHEMICAL SETS					
4	2200	6.18 x 10 ⁻⁶	50 - 56	10 ¹¹ - 10 ¹²	5.47
8	2600	2.6 x 10 ⁻⁶	76 - 101.5	10 ¹⁰ - 10 ¹¹	8.3 – 6.7
10	2400	5.0 x 10 ⁻⁶	55 - 63	10 ⁸ - 10 ¹¹	16.2 – 9.7
11	2200	3.4 x 10 ⁻⁶	46 - 54	10 ⁹ - 10 ¹⁰	4.9
12	2200	3.1 x 10 ⁻⁶	76 - 80	10 ⁸ - 10 ¹⁰	9.8 – 7.3
13	2600	2.6 x 10 ⁻⁶	55 - 60	10 ⁶ - 10 ¹¹	8-11
29	1550	4.6 x 10 ⁻⁶	25 - 51	10 ⁷ - 10 ⁹	9.8 – 5.2
30	900	5.0 x 10 ⁻⁶	N/A	N/A	5-6
DW-30	900	4.7 x 10 ⁻⁶	N/A	10 ⁸ - 10 ¹⁰	5.8
31	1750	6.2 x 10 ⁻⁶	12.5 - 38	10 ⁷ - 10 ⁹	6.5 – 4.2
33S	1600	7.8 x 10 ⁻⁶	37 - 44	10 ⁷ - 10 ⁹	5.9 – 4.5
350	1700	6.9 x 10 ⁻⁶	20 - 35	10 ⁶ - 10 ⁸	3.8 – 3.6
360	2200	5.5 x 10 ⁻⁶	20 - 40	10 ⁷ - 10 ⁸	6.7 – 6.4
HYDRAULIC SETS					
75	2600	4.1 x 10 ⁻⁶	50 - 60	10 ⁸ - 10 ⁹	4.4 – 4.2
76	2600	5.5 x 10 ⁻⁶	50 - 60	N/A	7.4 – 6.5

Physical properties were determined on specimens prepared under laboratory conditions using applicable ASTM procedures. Actual field conditions may vary and yield different results; therefore, data are subject to reasonable deviation.



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