Safety Data Sheet

Issue date 11-Jul-2018 **Revision date** 11-Jul-2018 **Revision Number** 1

1. IDENTIFICATION

Product identification

Product identifier	Cronatron™ 3880 Stainless Steel MIG Welding Wire
Other means of identification	CW3088
Recommended use	Welding Alloy
Restrictions on use	These items are only intended for normal welding purposes. For industrial use only

Supplier

Corporate Headquarters:
Cronatron, A Lawson Brand
Lawson Products, Inc.
8770 W.Bryn Mawr Ave.- Suite 900
Chicago, IL 60631
1-866-529-7664

Canadian Distribution Center:
Lawson Canada
7315 Rapistan Court
Mississauga, ON L5N 5Z4
(800) 323-5922

24 Hour Emergency Phone Number (888) 426-4851 (Prosar)

2. HAZARD(S) IDENTIFICATION

Hazard Classification

Solid metallic products are generally classified as 'articles' and do not constitute a hazardous material in solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would be generally classified as non-hazardous. Some hazardous elements contained in these products can be emitted under certain processing conditions such as but not limited to : burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding. Products in the solid state present no fire or explosion hazard. Small chips, fines, and dust may ignite readily, though. The following classification information is for the hazardous elements which may be released during processing.

Skin sensitization	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (repeated exposure)	Category 1

Symbol

Signal word DANGER

Hazard statements

H317 - May cause an allergic skin reaction
H350 - May cause cancer
H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary statements

Prevention

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P264 - Wash skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves/protective clothing and eye/face protection

Response

General

P314 - Get medical advice/attention if you feel unwell.
P321 - Specific treatment (see supplemental first aid instructions on this label)

Skin

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P362 - Take off contaminated clothing and wash before reuse

Storage

P405 - Store locked up

Disposal

P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Hazard(s) Not Otherwise Classified (HNOC)

None known.

Physical Hazards Not Otherwise Classified (PHNOC)

None known.

Unknown acute toxicity

None known

3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition

Mixture.

Chemical name	CAS-No	Weight %
Chromium	7440-47-3	4-32
Nickel	7440-02-0	06-22.5
Molybdenum	7439-98-7	0.4-4
Silicon	7440-21-3	0.5-1.5
Manganese	7439-96-5	0.5-2.5
Niobium	7440-03-1	0-0.64
Copper	7440-50-8	0.1-1
Iron	7439-89-6	0.1-0.5

4. FIRST-AID MEASURES

Necessary first-aid measures

Inhalation	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	Do NOT induce vomiting. Seek medical attention immediately.
Skin contact	Flush with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek medical attention if irritation persists.
Most important symptoms (acute)	Symptoms after inhalation:. Short term (acute) overexposure to the gases, fumes, and dusts may include irritation of the eyes, lungs, nose, and throat. Some toxic gases associated with welding may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty in breathing, frequent coughing or chest pains. The presence of chromium/chromate in fume can cause irritation of nasal membranes and skin. The presence of nickel compounds in fume can cause metallic taste, nausea, tightness of chest, fever, and allergic reaction. Excessive inhalation or ingestion of manganese can produce manganese poisoning. Overexposure to manganese compounds may affect the central nervous system, symptoms of which are languor, sleepiness, muscular weakness, emotional disturbances, and spastic gait resembling Parkinsonism. These symptoms can become progressive and permanent if not treated. Excessive inhalation of fumes may cause 'Metal Fume Fever' with flu-like symptoms such as chills, fever, body aches, vomiting, sweating, etc. Symptoms after skin contact:. Causes skin irritation. Symptoms after eye contact:. Causes eye irritation. Symptoms after ingestion:. Not expected to present a significant hazard under anticipated conditions of normal use. Harmful if swallowed.
Most important symptoms (over-exposure)	Not available.
Indication of any immediate medical attention and special treatment needed	Not available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	Not available.
Specific hazards	Thermal degradation may produce irritating or poisonous gases.
Special protective equipment for fire-fighters	In the event of fire, wear self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Wear personal protective clothing and equipment, see section 8. Ensure adequate ventilation. Avoid release to the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Methods and materials for containment and cleaning up	Take up mechanically. Collect the material in labeled containers and dispose of according to local and regional authority requirements. See information in section 7 for safe handling. Use personal protection recommended in Section 8. For waste disposal, see section 13 of the SDS.

7. HANDLING AND STORAGE

Precautions for safe handling

Welding may produce dust, fumes and gases hazardous to health. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only with adequate ventilation. Keep away from sources of ignition - No smoking. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry, and well-ventilated place. Keep away from incompatible materials. Keep away from open flames, hot surfaces and sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical name	OSHA PEL (TWA)	ACGIH OEL (TWA)	NIOSH - TWA
Chromium	1 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWA
Nickel	1 mg/m³ TWA	1.5 mg/m³ TWA	0.015 mg/m³ TWA 0.015 mg/m³ TWA
Molybdenum	15 mg/m³ TWA	10 mg/m³ TWA 3 mg/m³ TWA	-
Silicon	15 mg/m³ TWA 5 mg/m³ TWA	-	10 mg/m³ TWA 5 mg/m³ TWA
Manganese	5 mg/m³ Ceiling	0.02 mg/m³ TWA 0.1 mg/m³ TWA	3 mg/m³ STEL 1 mg/m³ TWA 1 mg/m³ TWA
Niobium	-	-	-
Copper	0.1 mg/m³ TWA 1 mg/m³ TWA	0.2 mg/m³ TWA 1 mg/m³ TWA	1 mg/m³ TWA 0.1 mg/m³ TWA 1 mg/m³ TWA
Iron	-	-	-

Appropriate engineering controls

Local exhaust and general ventilation must be adequate to meet exposure standards.

Individual protection measures, such as personal protective equipment

Eye protection

Wear helmet or face shield with filter lens of appropriate shade number. See ANSI/ASC Z49.1 Section 4.2. Provide protective screens and flash goggles,if necessary, to shield others.

Skin and body protection

Wear welding gloves. Wear head, hand, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum, this includes welders' gloves and a protective face shield and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate themselves from work and ground, especially if clothing and gloves are wet. Welders should not wear short sleeve shirts or short pants.

Respiratory protection

If exposure limits are exceeded or irritation is experienced, a NIOSH/MSHA approved respirator is recommended.

Hygiene measures

Wash hands after handling the product.

Canadian Province Occupational Exposure Limits

Chemical name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick - OEL	Newfoundland & Labrador - OEL	Nova Scotia - OEL	Ontario OEL	Prince Edward Island - OEL	Quebec OEL	Saskatchewan - OEL
Chromium	0.5 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWA	0.5 mg/m³ TWAEV	1.5 mg/m³ STEL 0.5 mg/m³ TWA
Nickel	1.5 mg/m³ TWA	0.05 mg/m³ TWA	1.5 mg/m³ TWA	1 mg/m³ TWA	1.5 mg/m³ TWA	1.5 mg/m³ TWA	1 mg/m³ TWA	1.5 mg/m³ TWA	1 mg/m³ TWAEV	3 mg/m³ STEL 1.5 mg/m³ TWA
Molybdenum	10 mg/m³ TWA 3 mg/m³ TWA	3 mg/m³ TWA 10 mg/m³ TWA 3 mg/m³ TWA 10 mg/m³ TWA	3 mg/m³ TWA 10 mg/m³ TWA	10 mg/m³ TWA	3 mg/m³ TWA 10 mg/m³ TWA 3 mg/m³ TWA 10 mg/m³ TWA	3 mg/m³ TWA 10 mg/m³ TWA	10 mg/m³ TWA 3 mg/m³ TWA 10 mg/m³ TWA 3 mg/m³ TWA	3 mg/m³ TWA 10 mg/m³ TWA 3 mg/m³ TWA 10 mg/m³ TWA	10 mg/m³ TWAEV	20 mg/m³ STEL 6 mg/m³ STEL 10 mg/m³ TWA 3 mg/m³ TWA 10 mg/m³ TWA 3 mg/m³ TWA
Silicon	-	10 mg/m³ TWA 3 mg/m³ TWA	-	10 mg/m³ TWA	-	-	-	-	10 mg/m³ TWAEV	20 mg/m³ STEL 10 mg/m³ TWA
Manganese	0.2 mg/m³ TWA	0.2 mg/m³ TWA 0.2 mg/m³ TWA	0.02 mg/m³ TWA 0.1 mg/m³ TWA	0.2 mg/m³ TWA	0.02 mg/m³ TWA 0.1 mg/m³ TWA 0.02 mg/m³ TWA 0.1 mg/m³ TWA	0.02 mg/m³ TWA 0.1 mg/m³ TWA	0.2 mg/m³ TWA 0.02 mg/m³ TWA 0.1 mg/m³ TWA	0.02 mg/m³ TWA 0.1 mg/m³ TWA 0.02 mg/m³ TWA 0.1 mg/m³ TWA	0.2 mg/m³ TWAEV 0.2 mg/m³ TWAEV	0.6 mg/m³ STEL 0.2 mg/m³ TWA 0.2 mg/m³ TWA
Niobium	-	-	-	-	-	-	-	-	-	-
Copper	0.2 mg/m³ TWA 1 mg/m³ TWA	1 mg/m³ TWA 0.2 mg/m³ TWA	0.2 mg/m³ TWA 1 mg/m³ TWA	0.2 mg/m³ TWA 1 mg/m³ TWA	0.2 mg/m³ TWA 1 mg/m³ TWA	0.2 mg/m³ TWA 1 mg/m³ TWA	0.2 mg/m³ TWA 1 mg/m³ TWA	0.2 mg/m³ TWA 1 mg/m³ TWA	0.2 mg/m³ TWAEV 1 mg/m³ TWAEV	0.6 mg/m³ STEL 3 mg/m³ STEL 0.2 mg/m³ TWA 1 mg/m³ TWA
Iron	-	-	-	-	-	-	-	-	-	-

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state Solid

Color Metallic

Odor Not available

Odor threshold Not available

pH Not applicable

Melting point/range °C Not available

Melting point/range °F Not available

Boiling point/range °C Not applicable

Boiling point/range °F	Not applicable
Flash point °C / °F	Not applicable
Evaporation rate	Not applicable
Flammability (Solid, Gas)	Not available
Lower explosion limit	Not available
Upper explosion limit	Not available
Vapor pressure	Not applicable
Vapor density	Not available
Relative density	Not available
Solubility	Not available
Partition coefficient (n-octanol/water)	Not applicable
Autoignition temperature °C	Not applicable
Autoignition temperature °F	Not applicable
Decomposition temperature °C	Not available
Decomposition temperature °F	Not available
Viscosity	Not available

10. STABILITY AND REACTIVITY

Reactivity	Not available.
Chemical stability	Stable under normal conditions. When using it may produce fumes and gases.
Possibility of hazardous reactions	None under normal conditions of use.
Conditions to avoid	None known.
Incompatible materials	None known.
Hazardous decomposition products	Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and welding consumables used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include:. Coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and the amount of ventilation, position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). When the electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section 3. Fume and decomposition products, not the ingredients in the electrode, are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration in the electrode. New compounds not in the electrodes may form during use.

Decomposition products include those originating from the volatilization, reaction or oxidation of the wire or rod plus those from the base metal and coating. Reasonably expected fume constituents of the fume could include complex oxides of iron, manganese, silicon, chromium, nickel, columbium, molybdenum, copper, carbon dioxide, carbon monoxide, ozone and nitrogen oxides. Some products will also contain antimony, barium, molybdenum, aluminum, columbium, magnesium, strontium, tungsten, and or zirconium. Fume limit for chromium, nickel, and or manganese may be reached before limit of 5 mg/m^3 of general welding fumes is reached. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may also be formed by radiation from the arc. One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet, if worn, or in the worker's breathing zone. See ANSI/AWS F1.1. Improve ventilation if exposures are not below limits.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure Inhalation. Ingestion.

Symptoms Harmful if swallowed. May cause an allergic skin reaction. May cause cancer.

Delayed and immediate effects as well as chronic effects from short and long-term exposure Causes damage to organs through prolonged or repeated exposure.

Numerical measures of toxicity

Chemical name	Inhalation LC50:	Dermal LD50:	Oral LD50:
Chromium	-	-	-
Nickel	-	-	> 9000 mg/kg (Rat)
Molybdenum	-	-	-
Silicon	-	-	= 3160 mg/kg (Rat)
Manganese	-	-	= 9 g/kg (Rat)
Niobium	-	-	-
Copper	-	-	-
Iron	-	-	= 30 g/kg (Rat)

ATEmix (dermal) Not available

ATEmix (oral) Not available

ATEmix (inhalation-gas) Not available

ATEmix (inhalation-vapor) Not available

ATEmix (inhalation-dust/mist) Not available

Carcinogenicity

Chemical name	ACGIH OEL - Carcinogens	IARC	OSHA RTK Carcinogens	NTP
Chromium	A4	Group 3	-	-
Nickel	-	Group 1 Group 2B	Listed	Known Reasonably Anticipated

Chemical name	ACGIH OEL - Carcinogens	IARC	OSHA RTK Carcinogens	NTP
Molybdenum	-	-	-	-
Silicon	-	-	-	-
Manganese	A4	-	-	-
Niobium	-	-	-	-
Copper	-	-	-	-
Iron	-	-	-	-

Canadian Province carcinogenicity limits

Chemical name	Alberta - Carcinogen	British Columbia - Carcinogen	Manitoba - Carcinogen	New Brunswick - Carcinogen	Nova Scotia - Carcinogen	Quebec - Carcinogen
Chromium	-	-	ACGIH A4	ACGIH A4	ACGIH A4	-
Nickel	-	IARC 2B	ACGIH A5	-	ACGIH A5	-
Molybdenum	-	-	-	-	-	-
Silicon	-	-	-	-	-	-
Manganese	-	-	ACGIH A4	-	ACGIH A4	-
Niobium	-	-	-	-	-	-
Copper	-	-	-	-	-	-
Iron	-	-	-	-	-	-

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical name	Algae/aquatic plants	Fish
Chromium	-	-
Nickel	0.18: 72 h Pseudokirchneriella subcapitata mg/L EC50 0.174 - 0.311: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	1.3: 96 h Cyprinus carpio mg/L LC50 semi-static 100: 96 h Brachydanio rerio mg/L LC50 10.4: 96 h Cyprinus carpio mg/L LC50 static
Molybdenum	-	-
Silicon	-	-
Manganese	-	-
Niobium	-	-
Copper	0.0426 - 0.0535: 72 h Pseudokirchneriella subcapitata mg/L EC50 static 0.031 - 0.054: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	0.0068 - 0.0156: 96 h Pimephales promelas mg/L LC50 0.2: 96 h Pimephales promelas mg/L LC50 flow-through 0.3: 96 h Pimephales promelas mg/L LC50 static 1.25: 96 h Lepomis macrochirus mg/L LC50 static 0.052: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 0.112: 96 h Poecilia reticulata mg/L LC50 flow-through 0.8: 96 h Cyprinus carpio mg/L LC50 static 0.3: 96 h Cyprinus carpio mg/L LC50 semi-static
Iron	-	13.6: 96 h Morone saxatilis mg/L LC50 static

Persistence and degradability Not available.

Bioaccumulation

Chemical name	CAS-No	Partition coefficient (log Kow)
Chromium 7440-47-3	7440-47-3	-
Nickel 7440-02-0	7440-02-0	-
Molybdenum 7439-98-7	7439-98-7	-
Silicon 7440-21-3	7440-21-3	-
Manganese 7439-96-5	7439-96-5	-
Niobium 7440-03-1	7440-03-1	-
Copper 7440-50-8	7440-50-8	-
Iron 7439-89-6	7439-89-6	-

Mobility in soil Not available.

Other adverse effects Not available

13. DISPOSAL CONSIDERATIONS

Disposal information Dispose of all product, residues and clean-up materials in accordance with local, state, and federal regulations.

Contaminated packaging Dispose in accordance with local, state and federal regulations.

14. TRANSPORTATION INFORMATION

Shipping Descriptions

DOT
Proper shipping name Not regulated

TDG
Proper shipping name Not regulated

IATA
Proper shipping name Not regulated

IMDG/IMO
Proper shipping name Not regulated

Marine Pollutants

Chemical name	CAS-No	USDOT Marine Pollutant	Canada TDG Marine Pollutant	IMDG Marine Pollutant
Chromium	7440-47-3	-	-	-
Nickel	7440-02-0	-	-	-
Molybdenum	7439-98-7	-	-	-
Silicon	7440-21-3	-	-	-
Manganese	7439-96-5	-	-	-
Niobium	7440-03-1	-	-	-
Copper	7440-50-8	X	-	X
Iron	7439-89-6	-	-	-

Special Precautions

Multi-modal shipping descriptions are provided for informational purposes and do not consider container size. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from the substances and on all actions in case of emergency situations.

15. REGULATORY INFORMATION

State regulations

U.S. state Right-to-Know regulations

Chemical name	CAS-No	Massachusetts - RTK	New Jersey - RTK	Pennsylvania - RTK
Chromium	7440-47-3	X	X	X
Nickel	7440-02-0	X	X	X
Molybdenum	7439-98-7	X	X	X
Silicon	7440-21-3	X	X	X
Manganese	7439-96-5	X	X	X
Niobium	7440-03-1	-	-	-
Copper	7440-50-8	X	X	X
Iron	7439-89-6	-	-	-

California Prop. 65

WARNING: This product contains a chemical(s) known to the state of California to cause cancer

Chemical name	CAS-No	California Prop. 65
Chromium	7440-47-3	-
Nickel	7440-02-0	Carcinogen
Molybdenum	7439-98-7	-
Silicon	7440-21-3	-
Manganese	7439-96-5	-
Niobium	7440-03-1	-
Copper	7440-50-8	-
Iron	7439-89-6	-

U.S. Federal Regulations

US EPA SARA 313

Chemical name	CAS-No	CERCLA/SARA Hazardous Substances RQ	SARA 313 - Threshold Values
Chromium	7440-47-3	5000 lb 2270 kg 10 lb 4.54 kg	1.0 %
Nickel	7440-02-0	100 lb 45.4 kg	0.1 %
Molybdenum	7439-98-7	-	-

Chemical name	CAS-No	CERCLA/SARA Hazardous Substances RQ	SARA 313 - Threshold Values
Silicon	7440-21-3	-	-
Manganese	7439-96-5	-	1.0 %
Niobium	7440-03-1	-	-
Copper	7440-50-8	5000 lb 2270 kg	1.0 %
Iron	7439-89-6	-	-

US EPA SARA 311/312 hazardous categorization Not applicable

International inventories All components of this product are listed on the following inventories: U.S.A. (TSCA 8(b)), Canada (DSL/NDSL) or are exempt.

Chemical name	DSL/NDSL	Inventory - United States - Section 8(b) Inventory (TSCA)	U.S. - TSCA (Toxic Substances Control Act) - Section 12(b) - Export Notification
Chromium	X	X	-
Nickel	X	X	-
Molybdenum	X	X	-
Silicon	X	X	-
Manganese	X	X	-
Niobium	X	X	-
Copper	X	X	-
Iron	X	X	-

Legend X - Listed

16. OTHER INFORMATION

NFPA No information available.

HMIS No information available.

Notice: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA).

Prepared by Regulatory Affairs

Issue date 11-Jul-2018

Revision date 11-Jul-2018

Revision note

Key to abbreviations

ACGIH (American Conference of Governmental Industrial Hygienists)
ATE (Average Toxicity Estimate)
DSL/NDSL (Domestic Substance List/Non-Domestic Substance List)
HMIS (Hazardous Materials Identification System)

IARC (International Agency for Research on Cancer)
IATA (International Air Transport Association)
IMDG/IMO (International Maritime Dangerous Goods/International Maritime Orgnaization)
NFPA (National Fire Protection Association)
NTP (National Toxicology Program)
OEL (Occupational Exposure Level)
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
PEL (Permissible Exposure Limit)
TSCA (Toxic Substance Control Act)
USEPA (United States Environmental Protection Agency)

Disclaimer

The information accumulated herein is believed to be accurate, but is not warranted to be, whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

End of Safety Data Sheet