

INSIDER TRADING POLICY

INTRODUCTION

As a director, officer or employee of James Hardie Industries plc (**James Hardie**) or its subsidiaries or affiliates (collectively, the **Group**), you are uniquely positioned to help direct both the day-today operations and long-term objectives of James Hardie and position it for continued success. However, in the course of performing your duties, you may, at times, have information regarding the Group that is not known to the public. As a consequence of your relationship with James Hardie, you are subject to various complex securities laws, which prohibit you from trading in James Hardie securities on the basis of such material non-public information or providing material nonpublic information to others who may trade on the basis of such information.

This Insider Trading Policy (this **Policy**) outlines the conditions under which you may conduct transactions in James Hardie securities and in the securities of other companies with which the Group has relationships (*e.g.*, with which James Hardie conducts business). This Policy also applies to certain family members, other members of your household and entities controlled by you or such other persons, as described below.

This Policy has been adopted by James Hardie in order to promote compliance with applicable securities laws and preserve the confidence of the securities markets in the fairness of trading in James Hardie securities and in order to reduce the likelihood that persons associated with the Group may contravene applicable insider trading laws and thereby protect James Hardie's reputation for integrity and ethical conduct. It is your obligation to understand and comply with this Policy.

Should you have any questions regarding this Policy, please contact James Hardie's Chief Compliance Officer (JHIplcComplianceOfficer@jameshardie.com).

This Policy applies globally and has been approved by the Board of Directors of James Hardie (the **Board**) and is reviewed and re-approved by the Board on an annual basis. As part of the Board's annual review process, this Policy is updated as required to reflect appropriate legal and regulatory changes. The Appendices to this Policy summarize certain provisions of Australian and U.S. laws that apply.

PERSONS TO WHOM THIS POLICY APPLIES

This Policy extends to all directors, officers and employees of the Group, as well as any consultants, contractors or other individuals retained by the Group who are designated as insiders by James Hardie. Additionally, this Policy extends to family members or anyone else residing in your household and any family members, not otherwise residing in your household, whose transactions in James Hardie securities are directed by you or are subject to your influence or control (*e.g.*, your parents or children). This Policy also applies to any entities that you or other persons who you have a relationship with may influence or control, including any corporations, partnerships or trusts (charitable or otherwise).

You are responsible for the transactions conducted by your family members and other affiliated persons or entities and should make them aware of their obligations under this Policy. Transactions by your family members and other persons or entities subject to this Policy are treated for purposes of this Policy as if they were undertaken by you or for your benefit. Accordingly, all references to you with regard to trading restrictions or pre-clearance procedures in this Policy also apply to your

family members or other persons or entities with whom you have a relationship that are subject to this Policy.

TRANSACTIONS COVERED BY THIS POLICY

James Hardie is a company incorporated under the laws of Ireland and it has listed its ordinary shares for trading on the Australian Securities Exchange (**ASX**) through the use of the Clearing House Electronic Subregister System (**CHESS**) via CHESS Units of Foreign Securities (**CUFS**). CUFS are a form of depositary security that represents a beneficial ownership interest in the securities of a non-Australian corporation. In addition, James Hardie has also listed its equity securities for trading on the New York Stock Exchange in the form of American Depositary Receipts (**ADRs**) and James Hardie International Finance Designated Activity Company (**JHIF**) has listed certain of its debt securities for trading on the Global Exchange Market (**GEM**) of the Irish Stock Exchange.

Transactions covered by this Policy include purchases and sales of ordinary shares, CUFS, ADRs, derivatives securities (such as put or call options) and debt securities. Trading also includes certain transactions under Group equity plans. Specifically, the Policy's trading restrictions do not generally apply to the exercise of stock options; however, the trading restrictions do apply to any sale of the underlying stock or to a cashless exercise of the option, as this entails selling a portion of the underlying stock to cover the costs of exercise.

Please note that certain additional restrictions, prohibitions and recordkeeping requirements are applicable to GEM-listed debt securities issued by JHIF. For additional information, please contact James Hardie's Chief Compliance Officer

PROHIBITION ON TRADING OR TIPPING OF MATERIAL NON-PUBLIC INFORMATION

While in possession of material non-public information, you are prohibited from buying or selling any James Hardie securities or engaging in any other direct or indirect actions to take advantage of material non-public information. This is true even if it will cause negative personal consequences (*e.g.*, foregoing gains) or was planned before learning of material, non-public information. This prohibition applies to both securities purchases and securities sales, regardless of how or from whom the material non-public information was obtained and continues to apply post-employment until the information becomes public or non-material. You are also prohibited from disclosing material non-public information to others who might use it for trading or might pass it along to others who might trade (referred to as "tipping"). This includes family members or any other person with whom you have a pattern of sharing confidences. For additional guidance and examples regarding what information may constitute material, non-public information, please see the Appendices to this Policy.

There are no exceptions to this general prohibition. Transactions that may be necessary or justifiable for independent reason (*e.g.*, raising money for a charity or an emergency) or small transactions are not excepted. This prohibition also applies to material non-public information relating to other publicly traded companies, including Group vendors, suppliers and customers. You should treat material non-public information about the Group's business partners with the same level of care required with respect information related to the Group. Information that is not material to the Group may nevertheless be material to the other firm.

PROHIBITION ON SHORT SELLING, HEDGING TRANSACTIONS AND SHORTTERM TRADING

Short sales of stock are transactions involving the borrowing of stock, selling it, and then buying stock at a later date to replace the borrowed shares. Short sales generally evidence an expectation on the part of the seller that the securities will decline in value and have the potential to signal to the market a lack of confidence in the company. Consequently, short sales of James Hardie securities are prohibited. Similarly, you are prohibited from purchasing or using, directly or indirectly, financial instruments (*e.g.*, swaps, collars, forward contracts, etc.) that are designed to hedge or offset any decrease in the market value of James Hardie securities, including both vested and unvested securities.

Short-term trading of James Hardie's securities can create a focus on our short-term stock market performance instead of promoting the Group's long-term business objectives. For these reasons, Designated Persons (as defined herein) who purchase (or sell) James Hardie securities in the open market may not sell (or purchase) any James Hardie securities of the same class during the six months following the transaction.

PRE-CLEARANCE ON USE OF MARGIN ACCOUNTS AND PLEDGING OF SECURITIES

If your James Hardie securities are held in a margin account or pledged as collateral, they may be sold without your consent under certain circumstances. As a result, a margin or foreclosure sale of James Hardie securities could occur when you are otherwise in possession of material, non-public information. Consequently, to the extent you desire to enter into a margin trading or pledging arrangement involving James Hardie securities, you must first obtain pre-clearance from the Chief Compliance Officer, as described below.

PROHIBITION ON TRADING OUTSIDE OF DESIGNATED OPEN WINDOW PERIODS

Trading in James Hardie securities by you may only occur during the designated open window periods. James Hardie has four routine open window periods, which generally are each a period of four weeks commencing two ASX trading days following the release of James Hardie's quarterly earnings announcement. James Hardie has the right to modify an open window period at any time and for any reason. The Board in its sole discretion may approve additional open window periods from time to time. For the avoidance of doubt, no person covered by this Policy is permitted to trade or otherwise conduct transactions in James Hardie securities outside of the designated open window periods. Moreover, you should note that consummating transactions in James Hardie securities, even during an open window period, does not protect you from insider trading violations if you are trading while otherwise in possession of material, non-public information. Consequently, you should use good judgment at all times regarding information you may possess. To the extent you have any questions regarding the nature or timing of the open window periods or the application of this policy to your particular situation, please contact James Hardie's Chief Compliance Officer (JHIplcComplianceOfficer@jameshardie.com).

SPECIFIC EXEMPTIONS TO PROHIBITIONS

You may request a specific exemption from the prohibitions outlined in this Policy, setting out the reasons and providing specific information regarding the scope and nature of the transaction. An exemption will only be granted if James Hardie is satisfied that there are good reasons that a prohibited transaction should be waived, for instance employee hardship, and such approval will not undermine the underlying spirit of the Policy and applicable securities laws.

In the application for a specific exemption, you must confirm that you are not otherwise in possession of material non-public information.

An exemption may be approved by the Chief Financial Officer or Chief Compliance Officer, or in the case of an exemption for a director or direct report to the Chief Executive Officer, by the Chairman of the Board or Audit Committee.

Other than those provided by applicable securities laws and expressly approved by James Hardie in accordance with this Policy, there are no exceptions to this Policy.

PRE-CLEARANCE OF DEALINGS BY DESIGNATED PERSONS

Designated Persons and their respective family members and other affiliated persons or entities **must** pre-clear any intended transaction in James Hardie securities with the Chief Compliance Officer, including any transaction during any open window period, not less than **two** trading days before the date of the intended transaction. This notice must contain a complete description of the intended transaction (*e.g.*, purchase, sale, gift, contribution), including the identity and number of James Hardie securities, and the date and the stock exchange on which the intended transaction is proposed to occur.

Designated Persons can only conduct transactions if: (i) the Chief Compliance Officer approves the specified transaction; and (ii) such person is not otherwise in possession of material non-public information. If the Chief Compliance Officer approves the intended transaction, such transaction must take place within the open window period following the approval (or such other period specified), at which time the transaction must comply with this Policy and applicable securities laws in all other respects. Subsequent confirmation of the transaction must be provided.

Clearance provided by the Chief Compliance Officer does not constitute investment advice and if clearance is denied, the denial must be kept confidential.

For purposes of this Policy, “Designated Persons” include: (i) all directors of James Hardie; and (ii) employees of the Group who have been designated such by or on behalf of the Chief Compliance Officer, including, without limitation, persons with the titles Chief Executive Officer, Chief Financial Officer, Executive Vice President or Controller, as well as certain employees who work in accounting, finance, treasury, legal and compliance and investor relations roles within the Group. **All Group employees who are classified as Designated Persons for purposes of this Policy will be notified of such classification by the Chief Compliance Officer and will remain classified as a Designated Person until further notice.** Additional employees may be temporarily subject to preclearance subject to their involvement in specific projects or events.

OBLIGATION OF CERTAIN PERSONS TO PROVIDE NOTICE OF DEALINGS

All directors must also notify James Hardie within two ASX trading days of any changes to their relevant interest in James Hardie securities so that James Hardie can notify the ASX of such changes through lodgment of an Appendix 3Y.

ROLE OF THE CHIEF COMPLIANCE OFFICER

The Chief Compliance Officer is responsible for administering this Policy and all determinations and interpretations of this Policy by the Chief Compliance Officer are final and not subject to further review. The Chief Compliance Officer will keep a record of all notifications of transactions supplied in accordance with this Policy. The Chief Compliance Officer may appoint assistants for purposes of administering this Policy.

INDIVIDUAL RESPONSIBILITY

You have an ethical and legal obligation to maintain the confidentiality of information about the Group and to not trade in James Hardie securities (or the securities of another company or firm) while in possession of material non-public information. In all cases, the ultimate responsibility for adhering to this Policy and avoiding improper conduct rests with you, and any action on the part of the Group, the Chief Compliance Officer or any other employee pursuant to this Policy does not in any way constitute legal advice or insulate you from liability under applicable securities laws. In the event of a violation of this Policy, James Hardie may take disciplinary action, including, but not limited to, declaring you ineligible for future participation in the Group's equity incentive plans, suspension or termination of your employment for cause. In addition, insider trading violations are aggressively pursued by relevant government agencies and violators may be subject to significant legal penalties, including criminal and civil fines and/or imprisonment, under applicable securities law. The same legal penalties apply to those who tip information even if they did not actually trade or benefit.

Applicable law may vary according to the jurisdiction in which the Group operates and where the applicable transaction occurs. The jurisdictions and applicable laws therein of significance to most persons covered by this Policy as of the date hereof, include (but may not be limited to):

- **Australia:** Corporations Act 2001 (Cth): prohibited conduct by persons in possession of inside information (1043A), use of position and use of information (ss 182-183), market manipulation (ss1041A), and false or misleading statements (s 1041E); and
- **United States:** Securities Act of 1933, as amended; the Securities Exchange Act of 1934, as amended; the rules and regulations thereunder, and case law interpreting the same.

A summary of the insider trading laws and regulations in the United States and Australia applicable as of the date of this Policy are provided in the Appendices to this Policy. These laws may change over time or may be subject to new interpretations by relevant courts or administrative bodies. James Hardie undertakes no obligation to update the legal summaries attached to this Policy or to advise of changes relative to such laws and regulations. You are expected to keep yourself familiar with your legal obligations and to fully comply with those obligations. You are encouraged to retain your own legal counsel in the event you have any question regarding the application of applicable law to your specific situation.

ACKNOWLEDGMENT OF RECEIPT AND UNDERSTANDING OF THIS POLICY

All Designated Persons and others as determined by the Chief Compliance Officer must certify that they have received a copy of this Policy and that they understand its contents. In addition, each Designated Person must inform their respective family members and other affiliated persons or entities of their obligations under this Policy.

LODGING POLICY WITH GOVERNMENT AGENCY

This Policy will be lodged with any government agency where the law in that particular jurisdiction requires it.

INSIDER TRADING POLICY – AUSTRALIA

The following summary is intended to provide you with an overview of applicable Australian securities laws and to highlight important requirements. The law in this area is complex and this Appendix does not cover every issue or situation. You should consult counsel as issues arise, and you should make yourself familiar with applicable legal requirements and with the requirements of the James Hardie Industries plc Insider Trading Policy (the **Insider Trading Policy**). The Insider Trading Policy does not in any way limit your obligations under applicable law. In addition, you are required to comply with all provisions of the Insider Trading Policy even if the laws of any applicable jurisdiction do not specifically require a certain provision of the Insider Trading Policy.

INSIDER TRADING

Section 1043A of the Corporations Act 2001 (Cth) prohibits insider trading. The section applies where a person is in possession of information and:

- the information is not generally available;
- a reasonable person would have expected that information to have a material effect on the price or value of a security if it was generally available;
- the person knew, or ought reasonably to have known, that the information was not generally available and if it were so, a reasonable person would expect it to affect the price or value of the security.

If the section applies, it is an offence for the person to:

- (a) whether as a principal or agent subscribe for, or enter into an agreement to subscribe for, purchase or sell, securities;
- (b) procure another person to subscribe for, purchase or sell securities; and
- (c) communicate information to another person with the knowledge that the person will or is likely to do (a) or (b).

For the purposes of section 1043A, information is “generally available” where the information is either readily observable, or made known in a manner that would bring it to the attention of people who commonly invest in securities of the kind whose price or value would be affected by the information.

Section 1043A of the Corporations Act 2001 (Cth) does not require that the “insider” be “connected” with the company whose securities are traded. It is sufficient that the person has information that is not generally available and undertaken one of the acts prescribed above.

PROHIBITION ON IMPROPER USE OF INFORMATION

Use of information obtained as a director, officer or employee of James Hardie Industries plc or its subsidiaries or affiliates (collectively, the **Company**) for his or her own gain may breach duties of confidence and of good faith owed to the Company under Australian corporate law. Sections 182 and 183 of the Corporations Act 2001 (Cth) prohibit directors, officers and employees of a corporation from making improper use of his or her position as a director, officer or employee or information gained by virtue of that position to gain directly or indirectly an advantage for him or

herself or for any other person or to cause detriment to the Company. Contravention of sections 182 and 183 may render a director, officer or employee liable for a monetary penalty or imprisonment.

MARKET MANIPULATION

Section 1041A of the Corporations Act 2001 (Cth) prohibits certain transactions that have the effect of creating an artificial price or maintaining prices at an artificial level.

Section 1041B of the Corporations Act 2001 (Cth) prohibits any action or omission which is calculated to create a false or misleading appearance of active trading in any securities on a stock market, or to create a false or misleading appearance concerning the market for or the price of such securities. The section prohibits certain conduct, including purchases or sales of securities which do not involve a change in the beneficial ownership of the securities, and which have an effect upon the market price of the securities.

FALSE OR MISLEADING STATEMENTS

Section 1041E of the Corporations Act 2001 (Cth) prohibits making a statement or disseminating information that is false in a material particular or materially misleading and is likely to induce the sale or purchase of or subscription for securities or to affect the market price of the securities where a person does not care whether the statement is true or false or knows or ought reasonably to have known that the statement or information was false in a material particular or materially misleading.

Section 1041F of the Corporations Act 2001 (Cth) prohibits a person fraudulently inducing or attempting to induce another person to deal in securities by making a statement known to be misleading, false or deceptive or by dishonest concealment of material facts or by recklessly making a statement that is misleading, false or deceptive.

INSIDER TRADING POLICY – UNITED STATES

The following summary is intended to provide you with an overview of applicable United States federal securities law and to highlight important requirements. The law in this area is complex, so this memorandum cannot cover every issue. You should consult counsel as issues arise, and you should make yourself familiar with applicable legal requirements and with the requirements of the James Hardie Industries plc Insider Trading Policy (the **Insider Trading Policy**). The Insider Trading Policy does not in any way limit your obligations under applicable law. In addition, you are required to comply with all provisions of the Insider Trading Policy even if the laws of any applicable jurisdiction do not specifically require a certain provision of the Insider Trading Policy.

UNITED STATES FEDERAL ANTIFRAUD RULES

A. Nature of Liability

Rule 10b-5, promulgated under Section 10(b) of the Securities Exchange Act of 1934, as amended (the **Exchange Act**), makes it unlawful for any person, in connection with the purchase or sale of any security, to make any untrue statement of a material fact or omit to state any material fact which would be necessary to make the statement made, in the light of the circumstances under which they were made, not misleading. Rule 10b-5 is the primary source of the United States case law that prohibits “insider trading.”

Rule 10b-5 also imposes an affirmative duty upon individuals to refrain from buying, selling or otherwise trading in securities while in possession of material information which is not yet publicly disseminated (**inside information**).

Rule 10b-5 also prohibits conveying inside information to others and from suggesting that anyone purchase or sell any Securities while aware of inside information. These practices, known as “tipping,” violate the United States securities laws and can result in the same civil and criminal penalties that apply to insider trading directly, even if the violator does not receive any money or derive any benefit from trades made by persons to whom the violator passed inside information.

This policy applies to securities of James Hardie Industries plc (the **Company**) as well as to securities of other companies, such as the Company’s customers and suppliers or a firm with which the Company is negotiating a major transaction with respect to which you may have access to confidential information. Directors, officers and employees of the Company, its subsidiaries and affiliates, certain consultants and contractors, or persons to whom they disclose inside information, should not trade for their own benefit or recommend trading in securities on the basis of inside information. The same guidelines should be observed by the immediate family and close associates of such persons.

Directors, officers and employees of the Company should keep in mind the following important considerations regarding insider trading:

1. Determining what information is “material” and “inside” at any given time can be difficult. “Material” information is that which would be considered important by reasonable investors

in deciding whether to buy, sell or hold the securities in question. Information generally would be considered material if it concerns earnings estimates, significant merger or acquisition proposals or agreements, proposed increases or decreases in dividends, stock splits, significant expansion or curtailment of operations, extraordinary borrowing, liquidity or litigation problems, important management changes, research developments or any other important developments, trends or uncertainties which may have an impact on the Company. Regulators will scrutinize a questionable trade after the fact with the benefit of hindsight, so it is best always to err on the side of deciding that the information is material and not trade if in doubt.

2. The standard for assessing whether information is “inside” or non-public, is whether the information is generally available to the public. Information generally could be considered to be available to the public when it has been released to the public through appropriate channels (*i.e.*, public regulatory filings, by means of an official press release or a statement from one of the Company's senior officers or designated spokespersons), and enough time has elapsed to permit the market to absorb and evaluate the information. As a general rule, without limiting other provisions of the Insider Trading Policy, you should consider information to be nonpublic until at least two full trading days have elapsed following public disclosure. All directors, officers, employees and consultants must maintain the confidentiality of Company information for competitive, security and other business reasons, as well as to comply with securities laws. All information about the Company or its business plans is potentially nonpublic information until it is publicly disclosed.
3. The insider trading rules apply to sales as well as purchases of Company securities.
4. “Trading” in Company securities includes the purchase and sale of Company securities in public markets, sales of Company securities obtained through the exercise of employee stock options, the purchase and sale of puts, calls and options, or other derivative securities (rights that are exercisable for or have a value based on the Company's securities), making gifts of Company securities and using Company securities to secure a loan.
5. Family members and close associates might be presumed to have an insider's knowledge.
6. Violation of the insider trading laws could result in criminal and administrative penalties (including fines, disgorgement of profits and imprisonment), civil damages, injunctions and consent decrees. Litigation, of course, also is expensive, time consuming and potentially embarrassing for a company and the individuals involved.
7. Transactions by insiders can violate securities laws even if no “inside information” is involved. Transactions which manipulate the price of the Company's securities will also give rise to liability.
8. There is no exception for small transactions or transactions that may seem necessary or justifiable for independent reasons, such as the need to raise money for an emergency expenditure.

B. Insider Trading and Securities Fraud Enforcement Act

Under the Insider Trading and Securities Fraud Enforcement Act of 1988 (**ITSFEA**), the Company and other controlling persons (which may be deemed to include directors and officers and the Company) who recklessly fail to prevent insider trading violations by employees, and the violator, may be held liable for civil penalties of up to the greater of about \$1.5 million (subject to increase) or three times the profit realized or the losses avoided for each violation by a controlled person, and may be subject to criminal fines of up to \$5 million and/or a jail sentence of up to 20 years. Both the violating controlled person and controlling persons may be held liable. In addition, the controlling person may also be held liable for violations by “tipsters.” ITSFEA also provides a private cause of action to contemporaneous traders against the violator as well as his or her controlling persons. Both the Securities and Exchange Commission (**SEC**) and the New York Stock Exchange are very effective at detecting and pursuing insider trading cases. The SEC has successfully prosecuted cases involving employees trading through foreign accounts, trading by family members and friends, and trading only a small number of shares.

LIMITATION ON PUBLIC SALES OF COMPANY SECURITIES BY DIRECTORS, OFFICERS AND OTHER DESIGNATED PERSONS

Rule 144 under the Securities Act of 1933, as amended (the **Securities Act**), provides a means by which persons who might otherwise be required to register stock under the Securities Act prior to its public resale (those who might otherwise be considered to be “statutory underwriters” under the Securities Act) may resell their stock without registration. Two types of shareholders are covered: (a) those that hold “restricted securities” and (b) those that hold “control securities” and are deemed “affiliates” of the Company. Rule 144 compliance will be a part of the pre-clearance process discussed in the Insider Trading Policy.

A. Definition of Affiliate

An **affiliate** is defined as a person who directly, or indirectly through one or more intermediaries, controls, or is controlled by, or is under common control with, the issuer of securities. In general, directors, executive officers and significant shareholders who have the power to influence or affect corporate affairs of the Company are “affiliates” of the Company. The SEC has defined **control** as direct or indirect power to direct or cause the direction of the management and policies of a person, whether through ownership of voting securities, by contract or otherwise. Control is dependent upon the circumstances of each case.

B. Definition of Restricted Securities and Control Securities

In general, **restricted securities** as defined in Rule 144 are securities acquired directly or indirectly from the Company or from an affiliate of the Company in a transaction or chain of transactions not involving any public offering (i.e., not acquired in a transaction registered with the SEC). Because the securities acquired upon exercise of a stock option granted under the Company's 2001 Equity Incentive Plan have been registered with the SEC, these securities are not “restricted securities.” However, even where restricted securities are not involved, an affiliate must still comply with Rule 144 when selling securities acquired upon exercise of these stock options or otherwise.

Control securities are securities held by an affiliate of the issuing company.

C. Application of Rule 144

Unless their resale is registered with the SEC or some other exemption applies, the resale of control securities is always subject to restrictions under Rule 144. The maximum amount of control securities that may be sold in any three month period by an affiliate of the Company pursuant to Rule 144 is the greater of (i) 1% of all outstanding shares of the applicable class of Company securities or (ii) the average weekly trading volume for such Company securities during the four calendar weeks preceding the proposed sale.

The volume limitations apply to the sum of sales by the shareholder personally plus sales by members of such person's household and minor children and sales by entities in which the shareholder holds a ten percent or more equity interest.

Rule 144 generally permits shareholders who are not affiliates of the Company, however, to resell their restricted securities free from Rule 144 requirements after a six-month holding period has been satisfied.

Other important restrictions applicable to an affiliate selling control securities exist as to the manner of offering and as to the filing of an appropriate notice with the SEC, and all of these must be carefully evaluated in considering the use of Rule 144 to provide a resale exemption in each individual situation.

In the case of securities acquired upon the exercise of stock options, the holding period does not commence until exercise of the option. However, again, note that the securities acquired upon exercise of options granted under the Company's 2001 Equity Incentive Plan have been registered with the SEC and therefore are not restricted securities. Securities acquired under options issued outside of the 2001 Equity Incentive Plan from time to time may or may not be restricted securities.

Before making sales of Company securities, affiliates (who own control securities) and those who think they may own restricted stock should discuss the proposed transaction with counsel.